



# RICE

General Announcements  
2007-2008



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Chair of the appropriate  
department (see pages 59-63)

Undergraduate and  
Undergraduate Curricula

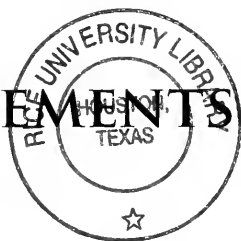
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RICE UNIVERSITY  
GENERAL ANNOUNCEMENTS  
2007-2008



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# MESSAGE FROM THE PRESIDENT

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What makes Rice extraordinary? Founding president Edgar Odell Lovett defined it by saying the university would “set no upper limit on its educational endeavor.” We remain intent on that ambition. In less than 100 years, Rice has achieved a distinctive position among America’s great research universities as a small great university. That is, while smaller than most, Rice is able to compete with the best in the nation, indeed, in the world.

From its inception, Rice has been dedicated to three missions: educating and preparing outstanding students for diverse careers and lives, contributing to the advancement of knowledge across a wide range of fields, and being of service to our city, our state, our nation, and our world. In all of these, Rice’s advantages lie in its relatively small size, urban location, diversity, focus on important areas of strength, and environment of interdisciplinary and inter-institutional collaboration. All of these work together to create a unique community of learning and discovery that produces leaders able to contribute to the solution of local, national, and global challenges.

Throughout its history, the university has recruited some of the most talented and capable students in the country and offered them a rigorous and demanding academic experience. Today, that includes a reimagining of the relationship between academics, student life, and real-world experiences shaped not just by close interactions with faculty teachers and mentors, but by thoughtfully integrated opportunities for intellectual, social, and moral development.

Learning of this type encourages more than a deep understanding of theory. It actively engages students in nonstandard settings outside the classroom, generating memorable, transformative experiences and honing the interpersonal skills necessary to face the full range of problems and challenges of professional life. It also cultivates the leadership skills that will boost the impact our graduates already have on our rapidly changing world.

Much research at Rice is addressed to identifying, understanding, and solving a wide range of scientific, technical, social, and cultural problems. But the university’s increasing engagement with the city of Houston does more than provide us with a living laboratory; it also vitalizes those explorations, making them more than academic exercises. We are as indebted to our great home city of Houston, with its rich social and cultural diversity, as it is to us.

But of course, opportunities for collaborative relationships are not limited geographically. The great universities of the 21st century will be global universities. Rice and its students benefit immensely from the sustained and deep relationships we are building with educational and policy institutions around the world. These intellectual bridges, in conjunction with our many qualities and opportunities, truly place Rice in the elite category of institutions whose effects are of global reach.

*General Announcements* is your guide through Rice’s diverse academic offerings, taught by an enormously talented faculty. It further serves as a handbook for the rules and responsibilities that govern both undergraduate and graduate student life in our community.

Welcome to Rice University.

David W. Leebron  
President  
William Marsh Rice University

# ACADEMIC CALENDAR 2007–2008

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## FALL 2007

Friday, August 1 .....	<b>Deadline:</b> Tuition due for entering freshmen
Sunday, August 10 .....	<b>Deadline:</b> Tuition due for returning undergraduate students
Sunday, August 19 (through Friday, August 24) .....	Orientation Week for new students
Friday, August 15 .....	<b>Deadline:</b> Tuition due for graduate students
Monday, August 27 .....	<b>First day of classes</b> Credit balance checks available to students
Monday, September 3 .....	<b>Labor Day (holiday–no classes)</b>
Friday, September 7 .....	<b>Deadline:</b> Last day to add courses without a fee <b>Deadline:</b> Last day to add a course without obtaining instructor's permission <b>Deadline:</b> Last day to convert a "Pass/Fail" to an earned letter grade for courses taken in spring 2007 <b>Deadline:</b> Last day to withdraw with a <b>100% refund of tuition and fees</b> <b>Deadline:</b> Last day to drop to part time with a <b>refund of tuition</b>
Friday, September 14 .....	<b>Deadline:</b> Last day to withdraw with a <b>70% refund of tuition</b>
Friday, September 21 .....	<b>Deadline:</b> Last day to complete late registration or add courses <b>Deadline:</b> Last day to drop courses without a fee <b>Deadline:</b> Last day to designate a course as "Audit" or vice versa <b>Deadline:</b> Last day anticipated aid for fall shows as a credit on student accounts <b>Deadline:</b> Last day to withdraw with a <b>60% refund of tuition</b>
Friday, September 28 .....	<b>Deadline:</b> Last day for instructors to submit final grades to clear "Incompletes" for courses taken in spring and summer 2007 <b>Deadline:</b> Last day to withdraw with a <b>50% refund of tuition</b>
Friday, October 5 .....	<b>Deadline:</b> Last day to withdraw with a <b>40% refund of tuition</b>
Friday, October 12 .....	<b>Deadline:</b> Mid-semester grades for first-year undergraduate students via the online grade submission process (in ESTHER) by <b>5:00 p.m.</b> <b>Deadline:</b> College course plans due to Dean of Undergraduates office for spring 2008 <b>Deadline:</b> Last day to withdraw with a <b>30% refund of tuition</b>

Monday, October 15 (through Tuesday, October 16) .....	<b>Midterm Recess</b>
Wednesday, October 17 .....	All classes normally held on Monday meet; all Wednesday classes cancelled (to equalize holidays by days of the week during the semester)
Friday, October 19 .....	<b>Deadline:</b> Last day to withdraw with a <b>20% refund of tuition</b>
Friday, October 26 .....	<b>Deadline:</b> Last day to withdraw with a <b>10% refund of tuition</b>
Wednesday, October 31 .....	<b>Deadline:</b> Last day to file an application for January 2008 degree conferral with the Office of the Registrar (undergraduate and graduate students) <b>Deadline:</b> Last day to file an application for a May 2008 degree conferral with the Office of the Registrar (undergraduate students only)
Thursday, November 1 .....	<b>Deadline:</b> Last day to file the following in the Office of Graduate and Postdoctoral Studies for January 2008 degree conferral: <ul style="list-style-type: none"> <li>• Thesis master's candidacy petitions</li> <li>• Certification of nonthesis master's</li> <li>• Form for automatic master's</li> <li>• PhD candidacy petitions</li> </ul>
Friday, November 2 .....	<b>Deadline:</b> Last day to drop courses for all graduate students and "returning" undergraduate students with a fee <b>Deadline:</b> Last day to designate a course as "Pass/Fail"
Monday, November 12 (through Friday, November 16) .....	Spring 2008 registration for currently enrolled undergraduate, graduate, and 5th year students
Wednesday, November 14 .....	<b>Deadline:</b> Last day to complete financial aid application for fall 2008
Friday, November 16 at 5:00 p.m. ....	<b>Deadline:</b> Last day to register for spring 2008 without "failure to register" fee
Thursday, November 22 (through Friday, November 23) .....	<b>Thanksgiving Recess (holiday—no classes)</b>
Friday, December 1 .....	<b>Deadline:</b> Last day to complete loan applications for fall 2008
Friday, December 7 .....	<b>Last day of classes</b> <b>Deadline:</b> (for fall 2007 matriculants only) Last day to drop courses—students must go to the Office of the Registrar by <b>5:00 p.m.</b> <b>Deadline:</b> For a January 2008 conferral of degree, students must submit theses to the Office of Graduate and Postdoctoral Studies by <b>12:00 p.m.</b>
Wednesday, December 12 (through Wednesday, December 19) .....	FINAL exams for undergraduate courses
Friday, December 28 at 12:00 p.m. ....	<b>Deadline:</b> Last day to submit final grades via the online grade submission process (ESTHER)



## SPRING 2008

Friday, January 4.....	<b>Deadline:</b> Tuition due for all students
Monday, January 7.....	<b>First day of classes</b> Credit balance checks available to students
Friday, January 11.....	<b>Deadline:</b> Last day to resolve grades of “Other” from fall 2007
Friday, January 18.....	<b>Deadline:</b> Last day to add courses without a fee <b>Deadline:</b> Last day to add a course without obtaining instructor’s permission <b>Deadline:</b> Last day for students to convert a “Pass/Fail” to an earned letter grade for courses taken in fall 2007 <b>Deadline:</b> Last day to withdraw with a <b>100% refund of tuition and fees</b> <b>Deadline:</b> Last day to drop to part time status with <b>refund of tuition</b>
Monday, January 21.....	<b>Martin Luther King Jr. Day (holiday–no classes)</b>
Friday, January 25.....	<b>Deadline:</b> Last day to withdraw with a <b>70% refund of tuition</b>
Friday, February 1.....	<b>Deadline:</b> Last day to complete late registration or add course(s) <b>Deadline:</b> Last day to drop courses without a fee <b>Deadline:</b> Last day to designate a course as “Audit” or vice versa <b>Deadline:</b> Last day to withdraw with a <b>60% refund of tuition</b> <b>Deadline:</b> Last day anticipated aid for spring shows as credit on student accounts <b>Deadline:</b> Last day to file the following in the Office of Graduate and Postdoctoral Studies for a May 2008 conferral of degree: <ul style="list-style-type: none"><li>• Thesis master’s candidacy petitions</li><li>• Certification for nonthesis master’s</li><li>• Form for automatic master’s</li><li>• PhD candidacy petitions</li></ul>
Friday, February 8.....	<b>Deadline:</b> Last day for instructors to submit final grades to clear “Incompletes” for courses taken in fall 2007 <b>Deadline:</b> Last day to withdraw with a <b>50% refund of tuition</b>
Wednesday, February 13.....	Financial aid application materials available to returning students to apply for need-based aid for 2008–09
Friday, February 15.....	<b>Deadline:</b> Last day to withdraw with a <b>40% refund of tuition</b>

Friday, February 22.....	<b>Deadline:</b> Mid-semester grades for first-year undergraduate students via the online grade submission process (ESTHER) by <b>5:00 p.m.</b> <b>Deadline:</b> College course plans are due to the Dean of Undergraduates office for fall 2008 <b>Deadline:</b> Last day to withdraw with a <b>30% refund of tuition</b>
Friday, February 29.....	<b>Deadline:</b> Last day to withdraw with a <b>20% refund of tuition</b> <b>Deadline:</b> Last day to file an application for a May 2008 degree conferral with the Office of the Registrar (graduate students only)
Saturday, March 1 (through Sunday, March 9) .....	<b>Midterm Recess (no classes)</b>
Friday, March 14 .....	<b>Deadline:</b> Last day to withdraw with a <b>10% refund of tuition</b> <b>Deadline:</b> Sophomores must file a Declaration of Major form with the Office of the Registrar
Friday, March 21 .....	<b>Deadline:</b> Last day to drop course(s) for all graduate students and “returning” undergraduate students with a fee <b>Deadline:</b> Last day to designate a course as “Pass/Fail” <b>Deadline:</b> Last day to complete financial aid applications for spring 2008
Monday, April 2.....	Summer school financial aid application available
Thursday, April 3 (through Friday, April 4) .....	<b>Spring Recess (no classes)</b>
Monday, April 7 (through Friday, April 11) .....	Fall 2008 registration begins for currently enrolled undergraduate, graduate, and 5th year students
Friday, April 11 .....	<b>Deadline:</b> Last day to complete loan applications for spring 2008 <b>Priority Deadline:</b> For returning and graduate students to submit financial aid applications for 2008–09 <b>Deadline:</b> Last day to register for fall 2008 without a “failure to register” fee
Tuesday, April 22.....	All classes normally held on Thursday meet; all Tuesday classes canceled (to equalize holidays by days of the week during the semester)
Wednesday, April 23 .....	<b>Last day of classes</b> All classes normally held on Friday meet; all Wednesday classes canceled (to equalize holidays by days of the week during the semester) <b>Deadline:</b> For spring 2008 undergraduate matriculants only: Last day to drop courses, students must go the Office of the Registrar by <b>5:00 p.m.</b>

**Deadline:** For a May 2008 conferral of degree, students must submit theses to the Office of Graduate and Post-doctoral Studies by **12:00 p.m.**

- Thursday, April 24  
(through Wednesday, April 30 at 12:00 p.m.) **All degree candidates:** All scheduled exams and take-home exams must be completed
- Monday, April 28  
(through Wednesday, May 5) ..... **All nongraduating students:** All scheduled exams and take-home exams for undergraduate courses
- Monday, April 30 ..... **Deadline:** For financial aid application for early summer session
- Friday, May 2 at 5:00 p.m. .... **Deadline:** Last day to submit final grades for all degree candidates via the online grade submission process (ESTHER) by **5:00 p.m.**
- Monday, May 5 ..... **Deadline:** Last day for May 2008 degree candidates to convert a “pass/fail” to an earned letter grade for spring 2008 courses, by **12:00 NOON**
- Saturday, May 10 ..... **Ninety-Fifth Commencement**
- Tuesday, May 15 ..... **Deadline:** For financial aid application for general summer session
- Wednesday, May 14 at 5:00 p.m. .... **Deadline:** Last day to submit final grades for all non-graduating students via the online grade submission process (ESTHER) by **5:00 p.m.**
- Friday, May 28 ..... **Deadline:** Last day to resolve grades of “Other” from spring 2008

## SUMMER 2008

### Early Session (May 13–May 30)

- Monday, March 31 ..... Summer term financial aid applications available
- Wednesday, April 2 ..... **Deadline:** For early application discount (by **2:30 p.m.**)
- Friday, April 18 ..... **Deadline:** For application to Early Summer Session courses (by **2:30 p.m.**)
- Monday, April 28 ..... **Deadline:** To submit financial aid applications for Early Summer Session
- Tuesday, May 6 ..... Early Summer Session admission status emailed  
Early Summer Session registration for Rice students begins online via Esther ([esther.rice.edu/](http://esther.rice.edu/))
- Monday, May 12 ..... **Registration:** 9:00 a.m.–1:00 p.m. for visiting students  
**Deadline:** For final tuition payment
- Tuesday, May 13 ..... **First day of classes–Early Summer Session**
- Thursday, May 15 ..... **Deadline:** For adding courses (by **3:00 p.m.**)  
**Deadline:** For online registration
- Monday, May 19 ..... **Deadline:** For visiting and Class III students to submit official transcripts (must be received by this date)  
**Deadline:** For dropping courses without academic penalty (by **3:00 p.m.**)\*

**Deadline:** For designating “Pass/Fail” option (by **3:00 p.m.**)

**Deadline:** For submitting refund requests (must be received by this date). Please see section on Withdrawal Penalty and Tuition Refund on the Tuition and Fees page on the School of Continuing Studies Web site.

Monday, May 26.....	<b>Memorial Day (holiday–no classes)</b>
Friday, May 30.....	<b>Last day of classes–Early Summer Session</b>
Tuesday, June 3.....	<b>Deadline:</b> For completion of all Early Summer Session course work, including final examinations. Exam schedule determined by instructor.
Friday, June 6.....	<b>Deadline:</b> For submitting grades for Early Summer Session online via Esther(esther.rice.edu/)
Monday, June 9.....	Grades for Early Summer Session available to students online via Esther(esther.rice.edu/). If grade is not posted, please contact instructor.

## SUMMER 2008

### General Session (June 2–July 25)

Monday, March 31.....	Summer term financial aid applications available
Wednesday, April 2.....	<b>Deadline:</b> For early application discount (by <b>2:30 p.m.</b> )
Friday, May 2.....	<b>Deadline:</b> For application to General Summer Session courses (by <b>2:30 p.m.</b> )
Tuesday, May 6.....	General Summer Session registration for Rice students begins online via Esther (esther.rice.edu/)
Monday, May 12.....	<b>Deadline:</b> For financial aid application for General Summer Session
Thursday, May 22.....	General Summer Session admission status emailed
Monday, May 26.....	<b>Memorial Day (holiday–no classes)</b>
Friday, May 30.....	<b>Registration, 9:00 a.m.–1:00 p.m.</b> for visiting students <b>Deadline:</b> For final tuition payment
Monday, June 2.....	<b>First day of classes–General Summer Session</b>
Monday, June 9.....	<b>Deadline:</b> For adding courses (by <b>3:00 p.m.</b> ) <b>Deadline:</b> For online registration <b>Deadline:</b> For dropping courses without academic penalty (no refunds after June 19) (by <b>3:00 p.m.</b> )* <b>Deadline:</b> For designating “Pass/Fail” option (by <b>3:00 p.m.</b> )
Monday, June 16.....	<b>Deadline:</b> For visiting and Class III students to submit official transcripts (must be received by this date) <b>Deadline:</b> For submitting refund requests (must be received by this day). Please see section on Withdrawal Penalty and Tuition Refund on the Tuition and Fees page on the School of Continuing Studies Web site.
Friday, July 4.....	<b>Independence Day (holiday–no classes)</b>

Friday, July 25 .....	<b>Last day of classes—General Summer Session</b>
Tuesday, July 29 .....	<b>Deadline:</b> For completion of all General Summer Session course work, including final examinations
Friday, August 1 .....	<b>Deadline:</b> For submitting grades for General Summer Sessions online via Esther (esther.rice.edu/)
Monday, August 4 .....	Grades for General Summer Session available to students online via Esther (esther.rice.edu/). If a grade is not posted, please contact the instructor.

## SUMMER 2008

### Full Session (Graduate Students Only)

Monday, April 28 .....	Full Summer Session registration begins for graduate students online via ESTHER (esther.rice.edu/)
Tuesday, May 13 .....	<b>First day of classes—Full Session</b>
Friday, May 16 .....	<b>Deadline:</b> For dropping courses without academic penalty
Monday, May 26 .....	<b>Memorial Day</b> (holiday—no classes)
Friday, July 4 .....	<b>Independence Day</b> (holiday—no classes)
Friday, August 22 .....	<b>Last day of classes—Full Session</b>
Friday, August 29 .....	<b>Deadline:</b> For submitting grades for Early Full Session online via ESTHER (esther.rice.edu)
Tuesday, September 2 .....	Grades for Full Summer Session available to students online via ESTHER (esther.rice.edu/). If a grade is not posted, please contact the instructor.

\*For courses starting after the first day of classes, the drop deadline is one week from the first day the class meets.





**The University  
and the Campus**

## THE UNIVERSITY AND CAMPUS

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Rice is a private, independent university dedicated to the “advancement of letters, science, and art.” Occupying a distinctive, tree-shaded, nearly 300-acre campus only a few miles from downtown Houston, Rice attracts a diverse group of highly talented students with a range of academic studies that includes humanities, social sciences, natural sciences, engineering, architecture, music, and business management (graduate study only). The school offers students the advantage of forging close relationships with members of the faculty and the option of tailoring graduate and undergraduate studies to specific interests. Students each year are drawn to this coed, nonsectarian university by the creative approaches it historically has taken to higher education.

One of the unique features of Rice is its residential colleges. Before matriculating, each of the university’s 2,988 undergraduates becomes a member of 1 of 9 residential colleges, each of which has its own dining hall, public rooms, and dorm on campus. Because each student is randomly assigned to one of the colleges and maintains membership in the same college throughout the undergraduate years, the colleges are enriched by the diversity of their students’ backgrounds, academic interests, and experiences, talents, and goals. A faculty master is assigned to each college and lives in an adjacent house and helps cultivate a variety of cultural and intellectual interests among the students, as well as support an effective system of self-government. Other faculty or members of the community serve as associates to individual colleges. The experience of college residence is indispensable to conveying the rich flavor of academic life at Rice, allowing students to combine their usual studies with an array of social events, intramural sports, student plays, lecture series, innovative college-designed courses, and active roles in student government.

Graduate students come to Rice for the chance to work closely with eminent professors and researchers who are seeking to extend the horizons of current knowledge. Although most of Rice’s 1,983 graduate students live off campus, taking advantage of the city’s readily available and affordable housing, space also is available in the university-owned Graduate Apartments. Graduate students have a voice in the university community through the Graduate Student Association, which organizes and funds regular social events.

Rice offers students the pleasures and challenges of academic life within the peaceful enclosure of a campus widely acclaimed for its beauty. Campus buildings, including an extensive computer center and the 2.3 million-volume Fondren Library, form graceful groupings under spreading live oaks. Rice boasts the largest open-air stadium in the city.

Rice students also enjoy all the commercial and cultural advantages of a major metropolitan center. The school maintains extensive technological links to the area’s many colleges and universities, the acclaimed Texas Medical Center, and other resources. And both students and faculty enjoy Houston’s panoply of cultural offerings, from opera to blues clubs and from a renowned collection of post-impressionist art to alternative art spaces. Rice and Houston together provide an ideal learning and living environment.



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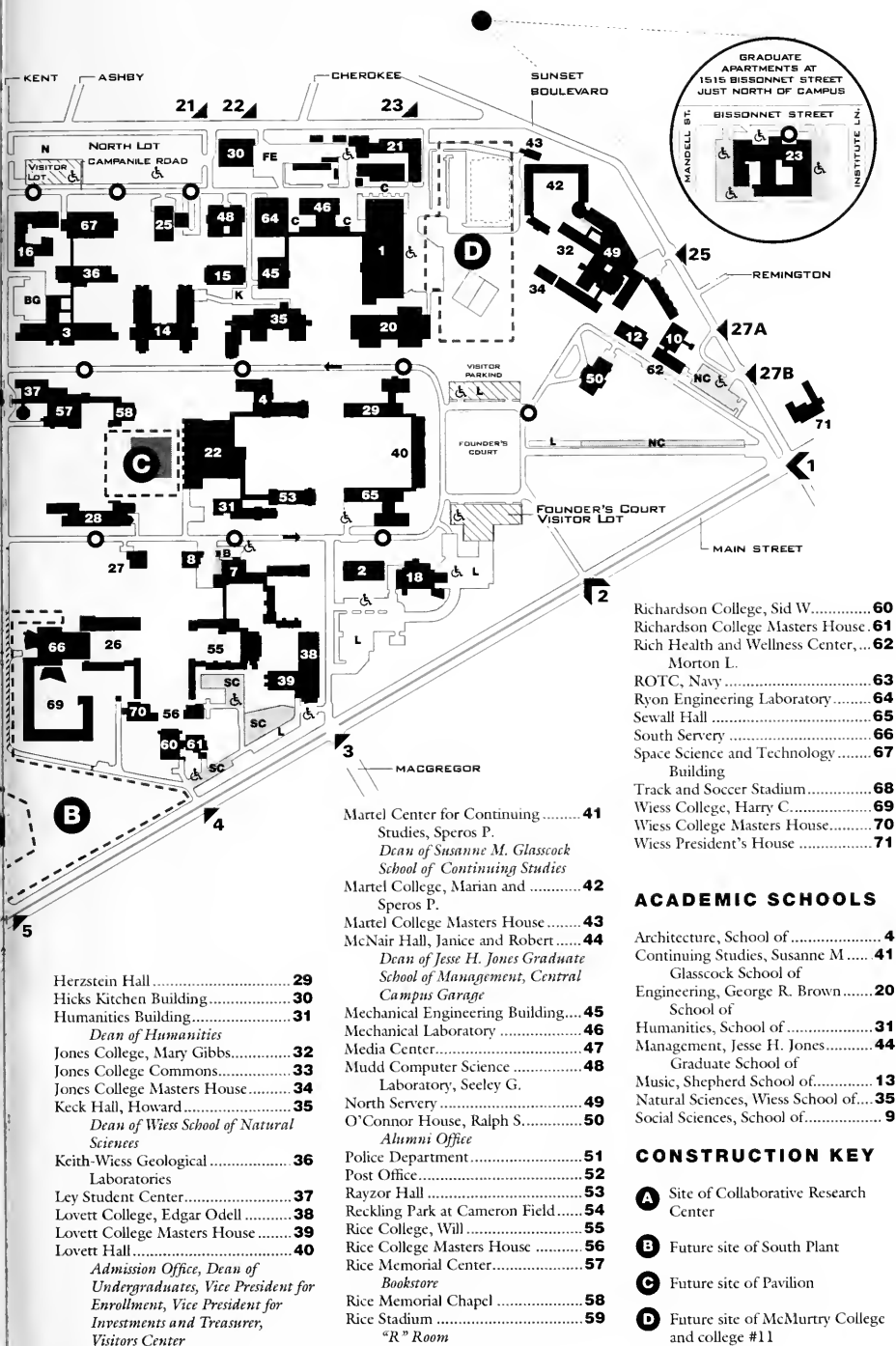
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# RICE UNIVERSITY CAMPUS MAP









**General Information  
for all Students**

## STUDENT RESPONSIBILITY

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The university expects all Rice students to exercise personal responsibility over their actions. Their behavior should reflect a respect for the law and for their contractual obligations, a consideration for the rights of others, and shared standards of considerate and ethical behavior.

Students are responsible for knowing and following all information, policies, and procedures listed in this *General Announcements*. Questions should be directed to the appropriate office or administrator.

Rice encourages self-discipline, recognizing that effective student government, including judicial processes, and the integrity of the honor system depend on the willingness of all students to meet community standards of conduct.

The university, however, reserves the right to insist on the withdrawal of any student whose conduct it judges to be clearly detrimental to the best interests of either the student or the university. The appropriate authorities take such action only after careful consideration.

No individual or group may use the name of the university or one of its colleges without prior approval of the university or the college.

### THE HONOR SYSTEM

The honor system, one of the oldest and proudest traditions at Rice, is administered by the Honor Council, whose student members are elected each year by the student body. Adopted by a student vote in 1916, the honor system has remained essentially the same since that time but for changes in the procedures and membership of the Honor Council.

Students take all written examinations and complete any specifically designated assignments under the honor system. By committing themselves to the honor system, all students accept responsibility for assuring the integrity of the examinations and assignments conducted under it. The Honor Council is responsible for investigating reported violations and for conducting a hearing when the facts warrant. The assistant dean of Student Judicial Programs, who reviews the results of the investigations and hearings, considers the council's recommendations when issuing penalties.

The Honor Council conducts an ongoing program to acquaint new students and faculty with the honor system. The Honor Code and other related information and resources are located at the homepage of the Honor Council: [www.ruf.rice.edu/~honor/](http://www.ruf.rice.edu/~honor/).

### THE CODE OF STUDENT CONDUCT

With regard to nonacademic disciplinary matters, the assistant dean of Student Judicial Programs and the University Court—a court of student peers—enforce the Code of Student Conduct that governs the administration of student order and discipline. The Code of Student Conduct applies to all undergraduate students, transfer students, graduate students, and professional students registered at Rice University, as well as to visiting students, Class III students, second degree students, and auditors from the time they arrive on campus for orientation until they have completed their studies or degrees and physically left campus. Organizations also are subject to this code. All enrolled students also are subject to Rice University policies, rules, and regulations. The assistant dean of Student Judicial Programs oversees the judicial system under the auspices of the Office of the Dean of Undergraduates, who has general authority over the student disciplinary system. The Code of Student Conduct and other related information and resources are located at the homepage of the University Court: [www.ruf.rice.edu/~ucourt/table.html](http://www.ruf.rice.edu/~ucourt/table.html).

## FACULTY GRADING GUIDELINES

The Committee on Examinations and Standing has drawn up the following guidelines on grading. Additional information is available on pages 29–31.

- The evaluation of the student's performance in a course and a decision on the appropriate grade is the responsibility of the designated instructor or instructors in the course.
- No student should be given an extension of time or opportunities to improve a grade that are not available to all members of the class, except for verified illness or justified absence from campus. No course assignments may be due between the last day of classes and the first day of the final examination period.
- Students in independent study courses are not to be allowed an extension beyond the time when grades are due. Faculty are to submit grades at the end of the semester for such students based on work completed during the semester. The instructor directing the independent study assumes responsibility with the student for ensuring that the work undertaken is appropriate to the span of a semester and for determining the degree credit to be received.
- The basis for grading and the expectations on all written assignments or tests should be clearly explained to the class in advance, preferably in writing at the beginning of the semester. The instructor should explain clearly which assignments or homework are covered by the honor system and which are not. To prevent allegations of plagiarism on written assignments, students should be warned that all direct and indirect quotations from other sources should be properly acknowledged. The instructor should explain the extent to which the student's paper is expected to be independent of the references and clearly distinguishable from them.
- Instructors should be willing to give any student an explanation of his or her grade as consistent with the grading for the rest of the class. For this reason, the committee urges the faculty to preserve all examinations and written material not returned to students, as well as grade records, for at least the following semester so that students may, if they wish, review with their instructor the basis for the grade received.
- Instructors may not change a semester grade after the grade has been submitted to the registrar, except when there is a clerical error in calculating the grade. This is a long-standing university rule of which the faculty are reminded by the registrar at the end of each semester. It is designed, in part, to protect the faculty from student pressure for grade changes. All other grade changes, including retroactive change to *withdrawal*, *incomplete*, or *other*, must be approved by the Committee on Examinations and Standing on the basis of a written petition from the student and on information from the instructor.
- There is no university requirement that a final examination be given in a course. It is university policy that final examinations that cover more than the material since the last examination, that are the only exam in the course, or that are comprehensive of the entire course may be given only during the final examination period. Such examinations may not, for example, be labeled "tests" and administered during the last week of classes. Final examinations normally are of 3-hour duration. Faculty who, under exceptional circumstances, wish to give longer examinations may do so only if the exam is scheduled as take-home. Under no circumstances may final exams exceed 5 hours.

- First-year students receive mid-semester grades around the 8th week of the fall and spring semesters so that they can, if advisable, enroll in tutoring or drop a class for which they may not be prepared. Faculty who teach first-year students in any of their classes will be asked to submit grades of standing for these students during the 7th week of the semester and should schedule the grading of tests, quizzes, or homework assignments accordingly. These grades are not recorded on the student's transcript nor calculated in the grade point average, but they are important indicators for students and their faculty advisors.
- Departments using teaching associates, adjunct professors, or visiting faculty of any kind should make sure these teachers are familiar with Rice grading procedures. A regular faculty member who is well-versed in the grading guidelines should be assigned to assist such instructors.

The chair of the Committee on Examinations and Standing or the Office of the Dean of Undergraduates will be glad to advise any faculty member faced with exceptional circumstances that may justify special consideration. Students may petition the committee concerning the application of these guidelines. Suspected or possible violations of the honor system should be submitted to the Honor Council

## STUDENT HEALTH, COUNSELING SERVICES, AND THE WELLNESS CENTER

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### STUDENT HEALTH FEE

By paying an annual student health service fee, all students gain access to the Student Health Service, Rice Counseling Center, and the Wellness Center. Detailed information on the care and services each provide is available from these centers.

### STUDENT HEALTH SERVICE

Student Health Service, an outpatient primary care clinic, is located in the Rich Health and Wellness Center in the former Brown College Commons. The clinic is staffed by primary care physicians, nurses, and ancillary support staff.

Clinic hours are from 8:00 AM to 5:00 PM, Monday through Friday, during fall and spring semesters. For after-hours and weekend medical care, students may choose among a number of local clinics and hospitals. Students must pay for all medical care outside the clinic's purview, including blood tests, x-rays, and outside physician consultations. Should such medical care be necessary, students are urged to review their insurance coverage and pick the best available option.

Care at the clinic is arranged through appointment at 713-348-4966. In serious emergencies, students should call the Rice University Police Department at 713-348-6000.

The clinic is open full time from the first day of Orientation Week until the day before commencement. It is closed during Thanksgiving and the Christmas break. The clinic also is open for reduced hours during the summer months.

The Student Health Service provides the following:

- Primary care for illness and injury with referrals to specialists when needed
- Maintenance of health records for all students



- Immunizations and other preventive services
- General information for all students
- Contraceptive counseling and routine Pap smears
- Allergy shots (students must provide serum after a specialist allergy workup)
- Physical examinations (e.g., for employment, transfer to another school, or scholarship expeditions)

**Confidentiality**—The Student Health Service physician–patient relationship is a confidential one. Medical records will be released only on receipt of written authorization from the student or as required by law or when the patient poses a significant risk to herself or himself or another person.

**Health Insurance**—All Rice students must have health insurance of their choice and must enter details of their health insurance online at <http://studenthealthinsurance.rice.edu> by August 15. Failure to do so will result in automatic billing for insurance. Students may purchase insurance through the university, as described online. Dependent coverage also is available. For questions about the Rice student health insurance plan, students should contact the Rice Counseling Center at [rucc@rice.edu](mailto:rucc@rice.edu). Rice's group coverage for 2007–08 is effective at 12:01 AM on August 15, 2007, and will terminate at 12:01 AM on August 15, 2008.

### RICE COUNSELING CENTER

Rice Counseling Center, in 301A Lovett Hall, addresses students' psychological needs with various programs and services. The center is open year-round except for scheduled holidays and occasional all-day staff retreats. Office hours for counseling and consultations are 8:30 AM to noon and 1:00 PM to 5:00 PM, Monday through Friday. Students can make appointments by calling 713-348-4867 or by visiting the center. There are no costs for Counseling Center services.

Typically, most students who use the counseling services bring with them very common concerns: roommate problems, breakup of a relationship, academic and/or interpersonal anxiety, family problems, difficulties adjusting to Rice, or confusion about personal goals, values, and identity. Counselors are equipped to handle a variety of issues, including substance abuse, eating disorders, sexual assault/abuse/date violence, depression, and the coming-out process. Rice Counseling Center offers both individual and group counseling, as well as educational workshops and programs.

When students need prolonged or specialized counseling or treatment, counselors refer them to an outside provider. The students, or their health insurance, must pick up these costs. All students who have paid the Health Service Fee are eligible for initial assessment sessions, consultations, crisis intervention, and educational programming. Individual or group counseling may also be available, if appropriate.

The Rice Counseling Center provides the following services:

- Initial assessment
- Short-term individual and couples counseling
- Group therapy and support groups
- Medication consultations with the center's consulting psychiatrist for students in counseling at the center
- Other consultations (e.g., how to make a referral or how to respond to a friend in distress)
- Educational programming (e.g., various presentations on mental health issues)

- Crisis intervention on a walk-in emergency basis during regular office hours; students may call 713-348-4867 for assistance with emergencies after hours or on weekends

**College Assistance Peer Program (CAPP)**—Students who have been carefully selected and trained in listening skills and mental-health education serve in this peer education program as supportive listeners and referral sources for other students. They also assist the center with its educational programming.

**Students with Disabilities**—Because students who have physical limitations may find it difficult to reach the Rice Counseling Center's 3rd floor location in Lovett Hall, staff will arrange to see those students in a more accessible location on campus. Students should call the center to make these arrangements.

**Confidentiality**—Counseling services are confidential; information about a student is not released without that student's written permission. By state law, confidentiality does not extend to circumstances where (1) there is risk of imminent harm to the student or others; (2) the counselor has reason to believe that a child or an elderly or handicapped person is, or is in danger of, being abused or neglected; (3) a court order is issued to release information; (4) the student is involved in a criminal lawsuit; or (5) the counselor suspects that the student has been the victim of sexual exploitation by a former health provider during the course of treatment with that provider.

## THE WELLNESS CENTER

The Wellness Center is located in the Rich Health and Wellness Center. The center works with Student Health Services and the Rice Counseling Center to encourage and reinforce behaviors in students that promote a higher quality of health and well-being. Key target areas include prevention of substance abuse and misuse, unplanned pregnancies and sexually transmitted diseases, sexual assault and harassment, promotion of good nutrition and a healthy body image, disease prevention, management of time and stress to decrease depression, and improvement in the overall wellness of students. The Wellness Center offers educational material and programs, web-based information, audio-visual and print materials, many free health supplies, and free, confidential consultations and referrals for students. Nutritional counseling, massage therapy, and acupuncture also are available in the center. There are fees for some services. Call 713-348-5194 for an appointment.

## DISABILITY SUPPORT SERVICES

Located in the Ley Student Center, Disability Support Services coordinates campus services for individuals with documented disabilities. For academic accommodations, adaptive equipment, or disability-related housing needs, Disability Support Services is the campus resource for all students with disabilities. Information is maintained on scholarships, internships, and other programs specific to students with disabilities. For more information, see the Disability Support Services website at [www.dss.rice.edu](http://www.dss.rice.edu). Students can schedule an appointment with the director of Disability Support Services by calling 713-348-5841.

**Section 504/ADA Coordinator**—The director of affirmative action serves as the Section 504/ADA coordinator at Rice University. Concerns or complaints relative to disability issues should be directed to the Office of Affirmative Action, 224 Herman Brown Hall, 713-348-4930.



**Information for  
Undergraduate Students**

## INTRODUCTION

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The undergraduate experience at Rice is one of intense personal interactions. The close sense of community created by individual placement in residential colleges is extended to warm intellectual and personal relationships with members of the Rice faculty. "Behind the hedges," the beautifully designed, spacious campus is small enough to encourage a sense of belonging even as students engage with the lively cultural currents of one of the country's largest cities.

The academic philosophy at Rice is to offer students beginning their college studies both a grounding in the broad fields of general knowledge and the chance to concentrate on very specific academic and research interests. By completing the required distribution courses, all students gain an understanding of the literature, arts, and philosophy essential to any civilization, a broad historical introduction to thought about human society, and a basic familiarity with the scientific principles underlying physics, chemistry, and mathematics. Building on this firm foundation, students then concentrate on studies in their major areas of interest.

Rice University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS), the recognized regional accrediting body in the 11 U.S. Southern states.

Rice grants 2 undergraduate degrees, the Bachelor of Arts (BA) and the Bachelor of Science (BS), in a range of majors. The majority of undergraduates earn the BA degree. The BS degree is offered in some science fields and in various fields of engineering accredited by the Accreditation Board for Engineering and Technology (ABET). Undergraduates may major in any of the numerous fields provided by the various schools of architecture, humanities, music, social sciences, science, and engineering. To accommodate the full range of individual student interests, specific interdepartmental majors also are available, as are selectively approved area majors. In certain departments, students also have the option of overlapping the upper-level course work of their undergraduate degree with those basic requirements necessary to earn a higher degree in the field, considerably reducing the time required to complete their graduate studies. The Shepherd School of Music offers a joint degree in music (BMus/MMus) that may be completed with a 5th year of study.

Through Rice's Education Certification Program, students interested in teaching in secondary schools may complete a program of teacher training, leading to certification in the state of Texas, together with the BA degree. Students interested in satisfying the requirements for admission to medical, dental, or law school should consult with the Office of Academic Advising for completing these programs in conjunction with the various majors.

## GRADUATION REQUIREMENTS

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### **DEGREE REQUIREMENTS FOR ALL BACHELOR'S DEGREES**

Students are responsible for making certain that their plan of study meets all degree and major requirements. To graduate from Rice University, all students must:

- Be registered at Rice full time for at least 4 full fall and/or spring semesters
- Complete the requirements of at least one major degree program

- Complete at least 120 semester hours (some degree programs require more than 120 hours)
- Complete at least 60 semester hours at Rice University
- Complete at least 48 hours of all *degree* work in upper-level courses (at the 300 level or higher)
- Complete more than half of the upper-level courses in *degree* work at Rice
- Complete more than half of the upper-level courses in their *major* work at Rice (certain departments may specify a higher proportion)
- Complete all Rice courses satisfying *degree* requirements with a cumulative grade point average of at least 1.67 or higher
- Complete all Rice courses that satisfy *major* requirements (as designated by the department) with a cumulative grade point average of at least 2.00 or higher
- Satisfy the English composition requirement (see below)
- Satisfy the Lifetime Physical Activity Program (LPAP) requirement (see below)
- Complete courses to satisfy the distribution requirements (see below)
- Otherwise be a student in good academic and disciplinary standing and not under investigation

To satisfy the English composition requirement, students must pass an English composition examination. Those receiving grades of “not satisfactory” on the exam must complete ENGL 103, *Introduction to Argumentation and Academic Writing*, a one-semester course carrying degree credit.

To satisfy the LPAP requirement, students must complete 2 different noncredit courses in LPAP. Students with disabilities may make special arrangements to satisfy this requirement.

In order to earn a 2nd degree, students must fulfill the requirements outlined on page 25.

## DISTRIBUTION REQUIREMENTS

Each student is required to complete at least 12 semester hours of designated distribution courses in each of Groups I, II, and III. The 12 hours in each group must include courses in at least 2 departments in that group. Divisional or interdisciplinary designations, e.g., HUMA or NSCI, count as departments for this purpose. Interdivisional courses approved for distribution credit may count toward the 12 semester hours in any relevant group; however, students may not count any one such course toward the 12 required hours in more than one group and may count no more than one such course toward the 12 required hours in any one group.

Students must complete the distribution requirements in each group by taking courses that are designated as a distribution course at the time of course registration, as published in that semester’s *Course Offerings*. Courses taken outside of Rice and transferred in can be used to satisfy distribution requirements, assuming they are on the list of approved and designated distribution courses at the time they were taken. Completed courses taken prior to matriculation are subject to the list of designated distribution courses at the time of matriculation.

The distribution system presupposes that every Rice student should receive a broad education along with training in an academic specialty. This goal is achieved by courses that are broad based, accessible to nonmajors, and representative of the knowledge, intellectual skills, and habits of thought that are most characteristic of a discipline or of inquiry across disciplines.

**Group I**—These courses have one or more of the following goals: They develop students' critical and aesthetic understanding of texts and the arts; they lead students to the analytical examination of ideas and values; they introduce students to the variety of approaches and methods with which different disciplines approach intellectual problems; and they engage students with works of culture that have intellectual importance by virtue of the ideas they express, their historical influence, their mode of expression, or their critical engagement with established cultural assumptions and traditions.

**Group II**—Three types of courses fulfill this requirement. The first are introductory courses that address the problems, methodologies, and substance of different disciplines in the social sciences. The second are departmental courses that draw on at least 2 or more disciplines in the social sciences or that cover topics of central importance to a social science discipline. The third are interdisciplinary courses team-taught by faculty from 2 or more disciplines.

**Group III**—These courses provide explicit exposure to the scientific method or to theorem development, develop analytical thinking skills and emphasize quantitative analysis, and expose students to subject matter in the various disciplines of science and engineering.

### **BACHELOR OF ARTS**

The specific requirements of individual majors leading to the Bachelor of Arts degree vary widely. No department may specify more than 80 semester hours (required courses, prerequisites, and related laboratories included) for the Bachelor of Arts.

In addition to meeting the degree requirements for all bachelor's degrees, to qualify for the Bachelor of Arts, students in all fields except architecture must complete at least 60 hours in course work outside the major, and students in architecture must complete at least 36 hours in course work outside the major.

### **BACHELOR OF SCIENCE IN THE SCHOOL OF NATURAL SCIENCES**

The Bachelor of Science degree is offered in astrophysics, biochemistry and cell biology, chemistry, chemical physics, earth science, ecology and evolutionary biology, and physics. The specific degree requirements vary from field to field and differ from those of the Bachelor of Arts in that there are greater technical requirements. No department may specify more than 80 semester hours (required courses, prerequisites, and related laboratories included) for the Bachelor of Science. To earn a BS degree in one of these fields, students must complete at least 60 hours in course work outside the major.

### **BACHELOR OF SCIENCE DEGREES IN ENGINEERING: BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING (BSChE), CIVIL ENGINEERING (BSCE), COMPUTER SCIENCE (BSCS), ELECTRICAL ENGINEERING (BSEE), MATERIALS SCIENCE (BSMS), MECHANICAL ENGINEERING (BSME), AND BIOEN- GINEERING (BSB)**

The Bachelor of Science degree in a given engineering field is distinct from the Bachelor of Arts degree in that it must meet greater technical requirements. In establishing a departmental major for the degree of bachelor of science in civil engineering, electrical engineering, materials science, and mechanical engineering, the department may specify no more than 92 semester hours (required courses, prerequisites, and related laboratories included). In establishing the departmental major for the BS in chemical engineering, the department may specify no more than 100 semester hours (required courses,

prerequisites, and related laboratories included). The bioengineering department specifies 94 semester hours for the BS degree (required courses, prerequisites, and related laboratories included). To earn a BS degree, students must meet the following minimum semester hour requirements in course work:

- All majors except chemical engineering, mechanical engineering, and computer science—a total of at least 134 hours
- Chemical engineering majors—a total of at least 132 hours, depending on area, up to 137 hours
- Mechanical engineering—132 hours total
- Computer science majors—a total of at least 128 hours

## OTHER BACHELOR'S DEGREES

The professional Bachelor of Architecture (BArch) degree requires a 5th year of study and a 1-year preceptorship. The Bachelor of Music (BMus) degree requires advanced courses in aural skills in addition to the core music curriculum.

## UNDERGRADUATE MAJORS

To receive a bachelor's degree, a student must complete the requirements for at least one major. Rice offers majors in many fields. Within some majors, students have the choice of a particular area of concentration. Students also may choose to fulfill the requirements for more than one major; such majors do not necessarily need to be in related fields. More detailed information on the departmental majors described below may be found in the Undergraduate Degree chart (pages 18–21), in the section “Departments and Interdisciplinary Programs” or by contacting the department. The process for declaring majors appears in the section Declaring Departmental Majors on page 24.

**School of Architecture**—Students admitted to the university as architecture majors must first complete 4 years of the BA program (architecture major) before applying to the BArch program in their senior year. If admitted, they are assigned a preceptorship with an architectural firm for a one-year period, after which they return to Rice to complete the BArch degree program.

**George R. Brown School of Engineering**—Rice offers majors in bioengineering, chemical engineering, civil engineering, computational and applied mathematics, computer science, electrical and computer engineering, environmental engineering sciences, mechanical engineering, materials science and engineering, and statistics. These programs lead to either the BA or the BS degree and may qualify students for further graduate study.

**School of Humanities**—Students may declare majors in art history, classics, English, French studies, German and Slavic studies (includes Russian), Hispanic studies, history, kinesiology, linguistics, philosophy, religious studies, and visual arts. Interdisciplinary majors are available in ancient Mediterranean civilizations, Asian studies, medieval studies, and the study of women and gender, while an interdepartmental major in policy studies combines courses from the School of Humanities and the School of Social Sciences.

**Shepherd School of Music**—Music students may opt for either a BA or a Bachelor of Music (BMus) degree in performance, composition, music history, and music theory. Students who pass a special qualifying examination may elect an honors program that leads to the simultaneous awarding of the BMus and Master of Music (MMus) degrees after 5 years of study.

**Wiess School of Natural Sciences**—All natural sciences departments, including biochemistry and cell biology, chemistry, earth science, ecology and evolutionary biology, mathematics, and physics and astronomy offer programs leading to the BA degree. BS degrees are offered in some departments. Majors include astronomy,

biochemistry, biology, biophysics, chemical physics, chemistry, earth science, mathematics, and physics. Students also may elect double majors combining one of the programs in natural sciences with another science, a humanities discipline, or an engineering field.

**School of Social Sciences**—Rice offers majors in anthropology, economics, mathematical economic analysis, political science, psychology, and sociology. Both the interdepartmental policy studies major and the cognitive sciences majors include science, engineering, and humanities courses, while the managerial studies major incorporates course work in the schools of engineering and management.

## UNDERGRADUATE DEGREE CHART

School Department	Undergraduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
<b>SCHOOL OF ARCHITECTURE</b>		
Architecture	BA, BArch	BA majors in architecture and in architectural studies
<b>GEORGE R. BROWN SCHOOL OF ENGINEERING</b>		
Bioengineering	BSB	Areas of concentration in cellular and molecular engineering, biomedical instrumentation, imaging, optics, and biomaterials and biomechanics
Chemical and Biomolecular Engineering	BA, BSChE	Focus areas in bioengineering, environmental science and engineering, materials science and engineering, and computational engineering
Civil and Environmental Engineering	BA, BS	BA degree in civil engineering and environmental engineering sciences BS with focus areas in environmental engineering, hydrology and water resources, structural engineering and mechanics, and urban infrastructure and management
Computational and Applied Mathematics	BA	Numerical analysis, operations research, optimization, differential equations, and scientific computation
Computer Science	BA, BSCS	Areas of concentration in architecture, artificial intelligence, computational science, foundations, human-computer interaction, and software systems
Electrical and Computer Engineering	BA, BSEE	Areas of concentration in computer engineering; systems: control, communications, and signal processing; and quantum electronics and photonics
Mechanical Engineering and Materials Science	BA, BSME, BSMS	Areas of concentration in aerospace, computational mechanics, fluid mechanics and thermal science, solid mechanics and materials, and system dynamics and control



Statistics	BA	Areas of concentration include applied and theoretical statistics, statistical computing, large data sets, bioinformatics/biostatistics, environmental statistics and finance
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**SCHOOL OF HUMANITIES**

Art History	BA	History of art
Classical Studies	BA	Classics, Greek, Latin
Education	No undergraduate degree offered	Leads to secondary teaching certificate in conjunction with BA in major field. See Education Certification
English	BA	American and British literature and culture 1300–present
French Studies	BA	
German and Slavic Studies	BA	German and German cultural studies
Hispanic Studies	BA	Spanish and Latin American literature and Spanish linguistics
History	BA	
Kinesiology	BA	Areas of concentration in health science, sports medicine, and sports management
Linguistics	BA	Areas of concentration in language, cognitive science, second language acquisition, and language, culture, and society
Philosophy	BA	Ethics, history of philosophy, metaphysics, philosophy of mind, philosophy of biology
Religious Studies	BA	Areas of concentration in specific religious traditions and/or methodology
Visual and Dramatic Arts	BA	Studio and theatre arts

**JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT**

Management	Undergraduate business minor	
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**SHEPHERD SCHOOL OF MUSIC**

Music	BA, BMus	BA in music; BMus in composition, music history, music theory, and performance; joint BMus/MMus with fifth year of study
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**WIESS SCHOOL OF NATURAL SCIENCE**

Biochemistry and Cell Biology	BA, BS	Part of an integrated biosciences curriculum. Degree programs include BA and BS in biochemistry and cell biology and a BA in the biological sciences
Chemistry	BA, BS	Chemical physics major offered jointly with the Department of Physics and Astronomy and resulting in a BS degree
Earth Science	BA, BS	Major tracks in geology, geophysics, geochemistry, and environmental earth science.
Ecology and Evolutionary Biology	BA, BS	Part of an integrated biosciences curriculum

Mathematics	BA	300-level courses oriented toward problem solving and applications and 400-level courses and above oriented toward theory and proofs; preparation for graduate studies or high school teaching or other areas; ample opportunity for double-majoring, especially with CAAM, COMP, ELEC, PHYS, or STAT; abundance of courses in analysis, topology, geometry, algebra, etc.
Physics and Astronomy	BA, BS	Majors in physics with specific options in applied physics, biophysics, computational physics, astrophysics, and astronomy; interdepartmental major in chemical physics

**SCHOOL OF SOCIAL SCIENCES**

Anthropology	BA	Areas of concentration in archaeology and social/cultural anthropology
Economics	BA	Majors in economics and in mathematical economic analysis
Political Science	BA	Areas of concentration in American, comparative, and international relations
Psychology	BA	Areas of concentration in cognitive psychology, industrial/organizational psychology, and human factors/human-computer interaction
Sociology	BA	Theory, methods, and major substantive areas of the field, including major social institutions and social processes

**INTERDEPARTMENTAL MAJORS**

Area Majors	BA	Requires approval of two or more departments, the Office of Academic Advising, and the Committee on Undergraduate Curriculum (see page 24)
Ancient Mediterranean Civilizations	BA	Anthropology, classical studies, Greek, Hebrew, Latin, history, history of art, linguistics, philosophy, and religious studies
Asian Studies	BA	Anthropology, Chinese, English, Hindi, history, history of art, humanities, Japanese, Korean, linguistics, political science, religious studies, sociology, Tibetan
Cognitive Sciences	BA	Computer science, linguistics, neuroscience, philosophy, and psychology
Education Certification	No undergraduate degree offered	Leads to secondary teaching certificate in conjunction with BA in major field
Environmental Sciences	BA	Core science classes and interdepartmental environmental electives in social sciences, economics, humanities, architecture, natural sciences, and engineering
Managerial Studies	BA	Accounting, economics, political science, and statistics
Medieval Studies	BA	History of art, classics, English, French, German, history, humanities, linguistics, Spanish, music, philosophy, political science, and religious studies

Policy Studies	BA	Environmental policy, government policy and management, healthcare policy and management, international affairs, law and justice, business policy and management, and urban and social change
Study of Women, Gender, and Sexuality	BA	Anthropology, art history, English, French studies, German, Spanish, history, humanities, economics, linguistics, music, psychology, philosophy, religious studies, and sociology

## TEACHER CERTIFICATION

Students in the teacher certification program earn Texas state teacher certification at the secondary level. Subjects include art, English, French, German, health science, history, Latin, life science, mathematics, physical education, physical science, physics/mathematics, science, social studies, and Spanish. For more information on teacher certification programs at the undergraduate and graduate levels, see Education Certification in the Departments and the Interdisciplinary Programs and Courses of Instruction sections.

## STUDY ABROAD, EXCHANGE, AND WORK ABROAD PROGRAMS

Rice University provides students the opportunity to embark on a cultural learning experience by offering a variety of destinations and program options worldwide. Students can choose to study abroad with one of more than 500 affiliated programs. Some affiliates specialize in intensive language instruction, some in field research opportunities, and others in facilitating direct enrollment at universities around the world. More than 12 direct exchange programs with internationally renowned universities allow Rice students to act as ambassadors abroad while providing the opportunity for a student from the host institution to study at Rice. Work programs allow students to travel to another country and work during or after their time at Rice. Experiences range from casual jobs to professional internships.

Each year, more than 250 undergraduates from across the disciplines study abroad and then apply the transfer credit toward their degrees. The study abroad advisors, in cooperation with the faculty advisors in each department, assist students in identifying the best programs for their individual interests and academic needs. To assure proper enrollment, transfer of credits and financial aid, students planning to study abroad must make their arrangements through the Rice Office of International Programs. This includes arranging prior approval for transfer credit through the relevant academic department(s) and the registrar.

Detailed information on affiliated programs, including application forms, is available from the Rice Office of International Programs (first floor, Ley Student Center) or online at [abroad.rice.edu](http://abroad.rice.edu).

## ACADEMIC REGULATIONS

All undergraduate students are subject to the academic regulations of the university. Students are responsible for making certain they meet all departmental and university requirements and academic deadlines. The Committee on Examinations and Standing administers the rules described below. Under unusual or mitigating circumstances, students may submit a written petition requesting special consideration to the committee. Students should address all correspondence to the committee in care of the Office of the Dean of Undergraduates.

## REGISTRATION

Currently enrolled students register in April for the fall semester and in November for the spring semester. Student registration is prioritized based on the hours earned and in progress. Entering students complete their registration during Orientation Week before classes begin in August. Undergraduate students are required to obtain a Registration/Add/Drop PIN in order to register for classes. To receive this PIN, students must meet with their divisional or major advisor to discuss their courses for the upcoming semester. The 1st Registration/Add/Drop PIN for each semester is valid from the registration period through the end of the 2nd week of classes. The 2nd Registration/Add/Drop PIN for each semester is valid from the beginning of the 3rd week of classes through the drop deadline. Registration/Add/Drop PIN validity dates can be found in the Academic Calendar.

To be properly registered, new students must complete, sign, and return a matriculation card. New students may not register or attend classes until they return a properly completed health data form and meet immunization and TB screening requirements. Immunizations required for admission are diphtheria/tetanus, measles, rubella, and mumps, with immunizations against hepatitis B and chicken pox recommended. The Mantoux tuberculin skin test also is required. A late fee of \$30 is charged for failure to submit a fully completed health data form by the required date. Each year, the Office of the Registrar publishes the specific deadlines for the semesters of that year.

Unless students elect a special payment plan, they must pay all tuition and fees for the fall semester by the end of the 2nd week in August and for the spring semester by the end of the 1st week in January. Any student not registered as of the last day to add classes or any student who is in arrears or becomes in arrears after the last day to add classes will be withdrawn from the university by default. Withdrawn students may not be allowed to receive credit for the withdrawn semester.

Appeals to this policy must be addressed to the dean of undergraduates. If readmitted, students must petition the Committee on Examinations and Standing to add classes late and must pay a late registration fee of \$120. Additionally, students who are readmitted after being withdrawn for nonpayment will be assessed a \$300 readmission fee.

**Drop/Add**—During the first 2 weeks of the semester, students may add or drop courses without penalty. After the 2nd week of the semester, the following conditions apply for adds and drops:

### **Undergraduate students in their first semester at Rice:**

- Must obtain instructor's permission and have a valid Registration/Add/Drop PIN to add a course in the 3rd or 4th week of classes (a \$10 fee will be assessed)
- May not add courses after the 4th week of classes, except with the approval of the Committee on Examinations and Standing (a \$50 fee will be assessed)
- May drop courses up to the last day of classes with a valid Registration/Add/Drop PIN (a \$50 fee will be assessed for courses dropped between week 4 and week 14\*)

### **All other students:**

- Must obtain instructor's permission and have a valid Registration/Add/Drop PIN to add a course in the 3rd or 4th week of classes (a \$10 fee will be assessed)

- May not add courses after the 4th week of classes, except with the approval of the Committee on Examinations and Standing (a \$50 fee will be assessed)
- May drop courses after the 4th week up to the end of the 10th week of classes with a valid Registration/Add/Drop PIN required (a \$10 fee will be assessed for courses dropped between week 4 and week 10\*)
- May not drop courses after the end of the 10th week of classes, except with the approval of the Committee on Examinations and Standing (a \$50 fee will be assessed)

For courses with start and end dates not coinciding with the normal Rice semester calendar, otherwise known as part of term courses, the registrar will consult with the instructor and set:

- The add deadline approximately one-third of the way into the course
- The drop deadline approximately two-thirds of the way into the course
- The add/drop deadline for these part of term courses will be posted on the registrar's website.

Students may not drop courses where the Honor Council has ruled a loss of credit.

\**Note:* Weeks are defined as academic instruction; thus, midterm recess is not included in this calculation.

**Course Load**—Students at Rice normally enroll for 15 to 17 semester hours each semester. For most students, this allows them to complete the requirements for graduation in 8 semesters. Students must secure permission in writing from the Office of the Dean of Undergraduates before registering for courses, if they want to:

- Register for or add to more than 20 credits
- Register for or drop below 12 credits
- Register concurrently at another university

No student may receive credit for more than 20 credits in a semester, including courses taken elsewhere, without this prior written approval.

Students also should be aware that the registrar's office must report a student's part-time status to various groups, such as loan agencies, scholarship foundations, insurance companies, etc. It is in the student's best interest to determine if he or she will be affected in any way by part-time status.

## REPEATED COURSES

Students may repeat courses previously taken, but the record of the first attempt (and grade) remains on the transcript, and both grades are included in term and cumulative grade point average calculations. In most cases, if students repeat courses previously passed, credit is awarded only once. For example, a student took HIST 117 and received a grade of B. The student repeated HIST 117 and received a grade of A. Both grades—the A and B—appear on the transcript and are included in his/her GPA; however, he/she only receives 3 credits toward his/her degree. On the transcript, a repeated course is indicated by one of the following values:

I—Included in GPA and earned hours

A—Included in GPA, but excluded from earned hours

E—Excluded from both GPA and earned hours

Some Rice University courses may be repeated for credit. They are specifically noted in the *Course Offerings* each semester. If a course may be repeated for

credit, each grade appears on the permanent record and is included in the grade point average.

If students repeat courses for which they have received either advanced placement or transfer credit, credit will not be counted. Nor can credit be received twice for students transferring courses that repeat previous enrollment at Rice.

Students may not receive credit twice for cross-listed, equivalent, or graduate/undergraduate equivalency courses taken at the same time. If the course is not repeatable, students may not receive credit for cross-listed, equivalent, or graduate/undergraduate equivalency courses taken in different semesters.

### **DECLARING DEPARTMENTAL MAJORS**

Students declare their major via the Declaration of Major form. The department chair or designee must sign the form acknowledging the declaration. The department will counsel the student about the requirements that must be met to complete the major and the likelihood the student will be able to meet them. If the department believes a student is not well prepared for success in its major, it may express its reservations on the form. No department or program, however, may, refuse to admit an undergraduate as a major, with the exception of the School of Architecture and the Shepherd School of Music or in the case of limitations of resources. In such cases, departments must publish criteria they will use to limit the number of majors together with their major requirements.

Students must declare a major during the spring of their sophomore year. They will not be permitted to register for the fall semester of their junior year without having declared a major. The major declaration deadline is listed in the Academic Calendar each year.

Students are free to declare a major at any time before this deadline and always are free to change their major by completing the appropriate form. However, such a change may entail one or more additional semesters at the university. Area majors are an exception to this rule and must be declared by the fourth semester before graduation (see Area Majors below).

Once a student declares a major, the title of the major is noted on the student's transcript, and a faculty advisor in the major department is assigned. Students and their advisors should regularly review progress toward their degrees. Introductory courses taken before formal designation of a major may be counted in fulfilling the major requirements.

For information on the specific requirements for any major, students should consult the departmental listings and seek the advice of the faculty member who is the designated major advisor. It is the responsibility of the student to meet regularly with their advisors to review progress toward their degrees.

### **AREA MAJORS**

Should the traditional departmental majors or programs not meet their exact needs, students may develop an area major closer to their particular interests and career goals. Area majors differ from double majors in that the latter must conform to the requirements of both departments while the former is a single major: It may combine courses from 2 or more departments, but it maintains its own specific major requirements. Area majors are limited by the available academic resources and must be distinct from other majors offered at Rice. Students who elect to declare an area major may not use it to form a double major, and they must still meet all the other university graduation requirements.

Students are usually the ones to initiate an area major, working it out in conjunction with the Office of Academic Advising and with faculty advisors from each of the departments involved. After designing a comprehensive and substantial course of study and deciding on an appropriate title, all parties sign off on the plan. The chairs of the involved departments and the Committee on the Undergraduate Curriculum determines final approval. At that point, the Office of Academic Advising officially certifies the approved plan to the registrar and goes on to oversee the major on behalf of the faculty advisors. Any change in the proposed requirements needs the approval of both the faculty advisors and the Committee on the Undergraduate Curriculum.

Students may not propose an area major if they are within 3 semesters of graduation unless the Committee on Examinations and Standing rules that exceptional circumstances warrant this action. Under no circumstances may students declare an area major in their final semester before graduation.

## SECOND 4-YEAR BACHELOR'S DEGREE

Currently enrolled undergraduates, Rice graduates with a bachelor's degree, and graduates from other universities with a bachelor's degree have the option of earning a *second* 4-year bachelor's degree at Rice in a different discipline. This degree must be a different bachelor's degree from the one already held; for example, the holder of a BA degree may pursue course work leading to the BS or BMus degree. Rice students should note that they can apply courses they completed at Rice as Class III students to the 2nd degree only with the approval of the major department for that degree. (Class III students are students who already have college degrees and are taking courses for credit outside of a Rice degree program.)

**Students Already Enrolled at Rice**—To earn a second 4-year bachelor's degree, also known as a *dual degree*, currently enrolled undergraduates who have not yet completed their first bachelor's degree must:

- Be accepted for the second major by the major department
- Fulfill all requirements for the second degree
- Complete at least 30 additional semester hours at Rice beyond the hours required for their first degree (these hours are applied to the second degree)

Students seeking admission to this program should complete an application for a second degree with the Office of the Registrar. The application should include a written statement identifying both proposed majors and specifying an approved course program for each. It also should contain an outline from the chair or undergraduate advisor of each department involved, indicating that the proposed course program satisfies all major degree requirements.

**Students with a Bachelor's Degree from Rice**—Rice graduates who wish to earn a different 4-year bachelor's degree must:

- Be accepted for the major by the major department
- Fulfill all requirements for the second degree
- Complete at least 30 additional semester hours at Rice beyond their first bachelor's degree (these hours are applied to the second degree)
- Attend Rice full time for at least 2 semesters during the fall and/or spring terms beyond their first bachelor's degree

The entire undergraduate record for these students continues cumulatively. Those seeking admission to this program should complete an application for a

second degree with the Office of the Registrar. The application should include a written statement specifying the proposed major and course program for the second degree, a supporting letter from the chair of the major department, and an explanation of the student's reasons for seeking a second degree.

**Students with a Bachelor's Degree from Another School**—Other graduates who wish to earn a 4-year bachelor's degree in a different major from Rice must:

- Fulfill all requirements for the second degree
- Complete at least 60 semester hours at Rice (these hours are applied to their Rice degree)
- Attend Rice full time for at least 4 fall and/or spring semesters

Interested students should apply for admission through the Office of Admission. See 43 for details on application requirements for Second Degree Students.

**Financial Aid and Housing**—Students seeking information about financial aid available to participants in the second degree program should contact the Office of Student Financial Services. Students admitted to the second degree program may request assignment to a college, but they will have lower priority for on-campus housing than students enrolled for a first 4-year bachelor's program. This means that housing probably will probably not be available.

## HONORS PROGRAMS

To enroll in the 2-semester **Rice Undergraduate Scholars Program**, students register for HONS 470–471 *Proposal Development and Research*. This program is for juniors and seniors in all disciplines who are considering graduate study and an academic career after graduation. Students enroll in the program plan and execute independent research under the supervision of a sponsoring faculty member (they may apply for funding to cover expenses related to their projects). They meet once a week to discuss each other's work and to hear a range of presentations on life in academia. Students may apply in the spring of each year. For more information, contact the program's faculty co-director.

Individual departments may offer undergraduates the option of honors program enrollment. These programs enable students to receive advanced training or to deepen their understanding of a given discipline through an intensive program of independent supervised research. Customary procedure is for students to submit a proposed project to their department's Undergraduate Committee, which helps them rework it, as needed, into a substantial but feasible proposal. Once accepted, students are assigned a faculty advisor to guide their research. The project concludes in an honors thesis, which the advisor and two readers evaluate, and an oral examination. Departments also use honors programs to formally recognize students who have shown outstanding work through their individual projects. Acceptance into a departmental honors program is at the discretion of the faculty. For specific requirements and procedures, students should contact the individual departments.

## TRANSFER CREDIT

Courses taken at another college or university that are appropriate to the Rice curriculum may be approved for transfer credit toward a Rice undergraduate degree. Students must have taken the course at a U.S. academic institution accredited by a regional accrediting agency or with a study abroad program approved by the Rice Office of International Programs and must have earned



a grade of C- or the equivalent or better. Students may not transfer courses taken pass/fail or on a similar basis at other institutions. Grades earned for transfer credit are not entered on the Rice transcript, and transferred courses have no effect on a student's Rice grade point average. After matriculation at Rice, students are limited to 14 semester hours of summer school transfer credit. Individual departments may place additional restrictions on particular courses and/or institutions. Similarly, various majors and degree programs may limit the amount of transfer credit that students may apply to them. All transferable credits from quarter-system schools will be converted to semester hours. In accordance with university guidelines and based on the external transcript, the Office of the Registrar will determine appropriate transferable credit hours and whether the credits are upper-level or lower-level.

For transfer work completed prior to matriculation, the Office of the Registrar, in conjunction with the academic departments, determines whether courses are appropriate for transfer to Rice as Rice equivalent courses or as TRAN, general elective hours. TRAN will be indicated as either upper- or lower-level and will count toward the total hours needed for graduation and for required upper-level credit if the TRAN credit is designated by the Office of the Registrar as upper-level. If courses transferred to Rice as TRAN credit are subsequently granted Rice equivalent course credit by the Office of the Registrar and academic department, the TRAN credit is reduced by the number of credit hours of the Rice equivalent course. The Rice equivalent course is then listed on the student's transcript and satisfies the university and major requirements the Rice course satisfies.

Continuing students who plan to transfer courses are strongly advised to seek prior approval. Without such approval, students cannot be certain transfer will be accepted at Rice. To receive Rice equivalent credit, students are required to complete the appropriate form and secure approval from the designated transfer credit advisor in the department offering the Rice equivalent course. Unless approval is secured before or after completing the transfer credit, students can expect transferable courses to be granted TRAN. Transfer credit will be evaluated only after the Office of the Registrar receives an official transcript from the other college or university. For credits obtained while studying abroad, the Office of the Registrar also must receive the necessary approval paperwork from the Rice Office of International Programs before transfer credit may be granted. Students may appeal to the Rice Office of International Programs to have credit granted from nonapproved study abroad programs. Such appeals generally should be justified by curricular needs of the student. In addition, credit from non-U.S. degree granting universities not part of a study abroad program must be approved by the Rice Office of International Programs.

Students with much transfer credit should be aware of the general graduation requirements (pages 14-17): students must complete at least 60 semester hours at Rice, complete more than half of their upper-level degree work and complete more than half of their upper-level major work at Rice (students also should check their specific departmental major requirements).

### **EXCUSED ABSENCES**

Students are expected to be in attendance at all of the classes for which they are registered during the entire course of the academic semester for which they are enrolled. The university understands, however, that students participating in university-sponsored extracurricular activities may, on rare occasions, need to miss a class session during the semester. As a matter of course, students should inform their instructors in advance of absences resulting from participation

in university-sponsored activities, and faculty normally will give a reasonable opportunity to make up work missed on such occasions.

No nonacademic university-sponsored event at which student attendance is required may be scheduled or rescheduled for any date after the day following the last day of classes. Exceptions may be granted by a quorum of the Committee on Examinations and Standing only for events where scheduling is not under the control of the university. On the class days falling during the last calendar week of classes, an individual student may participate in only one university-sponsored event, which may be scheduled or rescheduled, so long as no more than one night would be spent outside of Houston for travel. For events during the last week of classes, the reading period, and the final examination period, a quorum of the Committee on Examinations and Standing must be satisfied that each student is in satisfactory academic standing to participate in an event. If a quorum of the Committee on Examinations and Standing cannot meet in a timely fashion, then the executive committee of the Faculty Senate will handle exception requests.

Absences for activities other than university-sponsored events may be negotiated on an informal basis between the student and the faculty member. Alternatively, absences may be formally excused on a case-by-case basis if a petition explaining the nature of the event, accompanied by suitable documentation, is submitted to the Committee on Examinations and Standing at least two weeks before the event.

## **FINAL EXAMINATIONS**

The decision to give a final exam as a required part of the course rests with the instructor. All tests and examinations are conducted under the honor system. No examinations or other course assignments may be due between the last day of classes and the first day of the final examination period.

Examinations are considered final examinations when they:

- Cover more than the material learned since the last exam, or
- Are the only exam in the course, or
- Require comprehensive knowledge of the entire course

Such exams may be given only during the final examination period.

All class periods will be assigned a final examination time by the Office of the Registrar. Instructors may choose to use that time for a scheduled final. If they choose this option, the registrar will assign a room, and the final exam will be administered in that room at the designated time. Instructors may choose instead to give a take-home exam or no exam at all. Some instructors assign end-of-term projects or papers rather than final examinations. With regard to due dates, final papers or projects will be treated the same as take-home exams.

Take home exams should be available to the students as soon as possible after the end of classes, but must be available no later than the end of the next business day after classes have ended. Take home exams may be no longer than 5 hours in length. The due date of take-home exams may be no earlier than the end of the examination time assigned to that class by the registrar. Instructors may specify due dates later than this time but not later than the end of the last day of the examination period.

No student should be given an extension of time or opportunity to improve a grade that is not available to all members of the class, except for verified illness or justified absence from campus. However, students cannot be required

to take more than two scheduled exams in two consecutive calendar days. Students also cannot be required to complete more than two take-home and/or scheduled final exams on the same calendar day (unless this is the last day of the examination period). In both instances, if the student wishes to make alternative arrangements and is unable to work out such arrangements with the instructor(s) involved, the instructor of the third and any subsequent exams will be required to allow the student to reschedule that exam.

**GRADES** (See also Faculty Grading Guidelines on pages 9–10.)

**The Pass/Fail Option**—Undergraduates may register for courses on a pass/fail basis. Students:

- May not take more than 1 course as pass/fail per semester for each full year of residence (students studying in off-campus programs through Rice are considered to be in residence for the purpose of this rule)
- May not take more than 4 courses total as pass/fail (even if they are in a 5-year degree program)
- May not take more than a total of 14 semester hours total as pass/fail
- May register for only 1 course as pass/fail in a semester
- May not take as pass/fail those courses specifically required for the major or courses falling within the major department or major area. If students take such courses pass/fail, the registrar will replace the P with the grade earned during the final degree audit
- Must file the proper form for a course to be taken pass/fail no later than the posted deadline, usually the end of the 10th week of the semester

Students may convert a pass/fail course to a graded course by filing the proper form with the Office of the Registrar. The deadline is by the end of the 2th week of the following semester.

Students should be aware that while a grade of P does not affect their grade point average, a grade of F is counted as a failure and is included in their GPA. Students who take a course during the Rice summer session as pass/fail also should be aware that this counts toward their allowable total of 4 courses.

**Grade Symbols**—Instructors are required to report a grade for all students whose names appear on the class list. They grade their students using the following conventional symbols: **A+**, **A**, **A-**, **B+**, **B**, **B-**, **C+**, **C**, **C-**, **D+**, **D**, **D-**, **F**. For auditing students, instructors report either the **AUD** or the **NC** grade symbol, the **AUD** if the student met the audit requirements of the class, or the **NC** if they have not.

Students successfully completing a course pass/fail receive a **P**, and failure to complete the course successfully is indicated by an **F**. A **P** does not affect the grade point average. Completion of the English composition requirement is denoted by a grade of **E**.

Satisfactory/unsatisfactory courses are those that do not use traditional grading procedures. Such courses or labs are designated by the instructor and are, in most cases, graduate level courses. Students successfully completing a course satisfactory/fail receive an **S**; failure to complete the course successfully is indicated by an **F**. While an **S** does not affect the grade point average, an **F** does.

**Grade Designations**—Under certain circumstances, special designations accompany the student's grade. These designations do not affect the grade point average. The special designations include the following:

**AUD (“Audit”)**—This designation is only used for people auditing the course, and specifically where the auditing student has met the audit requirements of the course. There is no credit associated with an **AUD** grade designation.

**INC (“Incomplete”)**—Instructors report this designation to the registrar when a student fails to complete a course because of verified illness or other circumstances beyond the student’s control that occur during the semester. Students must complete the work, and instructors must submit a revised grade, by the end of the 5th week of the next semester, or an earlier date as defined by the instructor. Students with an “incomplete” must be certain that tests, papers, and other materials affecting their grade or essential to completing a course requirement are delivered *by hand* to the appropriate professor or office with ample time for the instructor to grade the documents and submit the final grade to the Office of the Registrar by the deadline. Loss or lateness because of mail service is not an acceptable excuse for failing to meet academic deadlines. A student who receives 2 or more “incompletes” in a semester may not enroll in the next semester for more than 14 semester hours. Students also should be aware that they may be placed on probation or suspension when the “incomplete” is changed to a grade, either by an instructor or by default.

**OT (“Other”)**—Instructors report this designation to the Office of the Registrar when a student fails to appear for the final examination after completing all the other work for the course. Students must resolve the matter, and instructors must submit a revised grade, by the end of the 1st week of the spring semester or by the end of the 4th week after Commencement, whichever is applicable. Students should be aware that they may be placed on probation or suspension when the “Other” is changed to a grade, either by an instructor or by default.

**W (“Official Withdrawal from University”)**—Students who officially withdraw from the university during the last 5 weeks of the semester will receive a final grade of “W” for each course in which they were enrolled at the time of withdrawal. In addition, the professors of those students who withdraw during that time will submit a grade based on the student’s academic achievement at the time of withdrawal to the Office of the Registrar.

Students who officially withdraw from the university before the last 5 weeks of the semester will not receive the grade of “W” for any courses in which they were enrolled for that semester. These courses will not be included on the official transcript.

**W (“Late Drop with Approval”)**—A student who receives approval from the Committee on Examinations and Standing to drop a course after the designated drop deadline will receive a grade of “W” for that course. When requests for late drops are denied by the committee, the registrar records the submitted grade.

If a student drops a class before the designated drop deadline for the semester, the course will not be included on his/her official transcript. Students in their 1st semester at Rice may drop a class up until the last day of classes, and the course will not be included on the student’s official transcript.

**NC (“No Credit”)**—This designation signals that no credit was granted for the course. It is used in situations where a person auditing a course has not met the audit requirements of the course. The “No Credit” designation also is used in various honor council or judicial situations where a student is required to forfeit credit for a course.

**Grade Points**—To compute grade point average, letter grades are assigned numeric values as follows:

GRADE	GRADE POINTS	GRADE	GRADE POINTS
A+	4.33	C	2.00
A	4.00	C-	1.67
A-	3.67	D+	1.33
B+	3.33	D	1.00
B	3.00	D-	0.67
B-	2.67	F	0.00
C+	2.33		

**Grade Point Average Calculation**—For each course, the credit hours attempted and the points for the grade earned are multiplied. The points for each course are added together, and the sum is divided by the total credit hours attempted. Grade point averages are noted each semester on the student's official transcripts.

**President's Honor Roll**—This honor roll, published each semester, recognizes outstanding students. To be eligible, students must have earned grades in a total of 12 or more semester hours without receiving a grade of F. (Pass/Fail courses may not be counted.) Approximately the top 30 percent of undergraduates receive recognition each semester. While undergraduates enrolled in a 4-year bachelor's degree program always are eligible for the President's Honor Roll, students enrolled in 5-year bachelor's or master's programs are eligible only during their 1st 8 semesters.

**University (Latin) Honors**—Unlike the President's Honor Roll, which recognizes academic excellence achieved over a single semester, eligibility for the three categories of Latin Honors (*summa cum laude*, *magna cum laude*, and *cum laude*) are based on the cumulative grade point average for all undergraduate work at Rice. Recipients are determined by the following procedure: At the end of the spring semester and after receipt of all grades, the grade point average within the highest 5 percent of the year's graduating class is recommended for the *summa cum laude* honor. The grade point average included within the next highest 10 percent is used to determine those eligible to graduate with the *magna cum laude* honor. Finally, the grade point average included within the next 15 percent is used to determine those students eligible to graduate with the *cum laude* honor. Thus, approximately 30 percent of each graduating class receives Latin Honors on graduation.

## ACADEMIC DISCIPLINE AND OTHER DISCIPLINARY MATTERS

**Academic Probation**—Students are placed on academic probation at the end of any semester if:

- Their grade point average for that semester is less than 1.67, or
- Their cumulative grade point average is less than 1.67 (this requirement is waived if the grade point average for that semester is at least 2.00)

The period of probation extends to the end of the next semester in which the student is enrolled. Students on probation (academic or other disciplinary matters) may not be candidates for, or hold, any elected or appointed office, nor are they allowed to enroll in more than 17 semester hours.

**Academic Suspension**—Students are suspended from the university at the end of any semester if:

- They earn grades that will place them on academic probation a 3rd time, or
- They have a grade point average for the semester that is less than 1.00 (exceptions are made for students completing their 1st semester at Rice)

Students readmitted after a period of academic suspension will be suspended again, in any succeeding semester, if:

- Their cumulative grade point average is less than 1.67, or
- Their semester grade point average is less than 2.00

The 1st suspension period is normally 1 semester; the 2nd suspension period is at least 2 semesters. Students are not readmitted after a 3rd suspension.

Students who are going to be suspended for academic performance are notified by the registrar after all final grades have been received and posted to their record. Suspension is lifted the 1st day of class of the semester when the student returns to the university. When students serve the nominal term of suspension but do not intend to return to Rice, suspension is lifted after permission from the Committee on Examinations and Standing is granted.

Students facing a 1st or 2nd academic suspension who verify with the registrar and their department that they will complete their degree requirements in 1 semester if allowed to return, may have their suspension reduced to probation. Students may invoke this ruling only once for a given academic degree plan.

Students who graduate at the end of a semester under academic circumstances that would normally place them on probation or suspension will not have the terms “academic probation” or “suspension” placed on their transcript for that semester.

**Readmission after Suspension**—Students seeking readmission after academic suspension should address a letter of petition to the Committee on Examinations and Standing, in care of the Office of the Dean of Undergraduates, which must be received by July 1 for readmission in the fall semester and December 1 for readmission in the spring semester. The petition must include 2 supporting letters from persons for whom the student has worked during the suspension period as a student or an employee. The petition also must include an academic program approved by the Office of Academic Advising. If the problems causing the previous difficulty appear to be resolved, the student generally is readmitted. Students returning from academic suspension must maintain regular contact with the Office of Academic Advising throughout the semester. In some instances, the committee may postpone approval of readmission or rule that suspension is permanent.

Although it may do so at its discretion, the Office of the Registrar does not normally place on probation or suspension students who perform poorly in the Rice Summer School. Students should be aware, however, that Rice Summer School grades are included in their grade point averages.

**Disciplinary Probation and Suspension**—The assistant dean of student judicial programs may place students on probation or suspension for an honor system violation or for other disciplinary or code of conduct reasons. Students who are on disciplinary suspension, under investigation for disciplinary violations, or who have disciplinary proceedings pending against them (including for an honor system or code of conduct violation) may not receive their degree even if they have met all academic requirements for graduation. Students who are suspended must leave the university within 48 hours of being informed of the dean’s decision, though in cases of unusual hardship, the college master and assistant dean of student judicial programs may extend the deadline up to 1 week. Any tuition refund will be prorated from the official date of suspension, which is determined by the registrar. While on disciplinary suspension or probation, students may not run for, or hold, any elective or appointed office in any official Rice organization, nor may they serve as Orientation Week advisors once they return to the university following a suspension. Participation in student activities on and off campus and use of Rice facilities, including

the student center, the colleges, the playing fields, the gym, and the computer labs, are limited to *enrolled* students.

Students seeking readmission after leaving the university because of **disciplinary actions (including honor system or code of conduct actions) or other nonacademic action** should submit a petition in writing for review by the assistant dean of Student Judicial Programs.

## WITHDRAWALS AND LEAVES

**Voluntary Withdrawal and Readmission**—Students may withdraw voluntarily from the university at any time during the semester up until the last day of classes. Students wishing to withdraw should inform their college master in person and give written notification to the Office of the Dean of Undergraduates, who notifies other offices of the university as necessary. Students who fail to give notice of withdrawal should expect to receive failing grades.

If they are in good academic standing at the time of their withdrawal, students may be considered for readmission after they submit a written application to the Office of the Dean of Undergraduates. The petition, received no later than July 1 for the fall semester, and December 1 for the spring semester, should include an academic plan approved by the Office of Academic Advising and two letters of support. If students withdraw within 5 weeks of the last day of classes, they must submit the written application to the dean of undergraduates who, at his discretion, will submit it to the Committee on Examinations and Standing. If students withdraw within 5 weeks of the last day of classes, the Committee on Examinations and Standing takes into account their grades (which reflects their performance up to the day of withdrawal) when ruling on their readmission. Students whose grades would have led to suspension had they not withdrawn are treated, for purposes of readmission, as if they had been suspended. If students voluntarily withdraw for major medical or psychological/psychiatric reasons, however, they must meet the readmission conditions for a medical or involuntary withdrawal.

**Involuntary Withdrawal**—The university may insist on a student's involuntary withdrawal if, in the judgment of the dean of undergraduates, the student:

- Poses a threat to the lives or safety of him/herself or other members of the Rice community
- Has a medical or a psychological condition that is likely to be exacerbated by the academic and/or living environment and the student's ability to address it effectively
- Has a medical condition or demonstrates behavior that seriously interferes with the education of other members of the Rice community

Students should submit written petitions for readmission no later than June 1 for the fall semester and November 1 for the spring semester after medical or involuntary withdrawal to the Office of the Dean of Undergraduates. This petition must include documentation of treatment provided and students must have an interview with the director of the Rice Counseling Center or Student Health Services or their designees. The petition also must include an academic plan approved by the Office of Academic Advising.

Students who withdraw for psychological reasons within the last 5 weeks of the fall semester will not be able to petition for readmission for the spring semester immediately following the semester from which they withdrew. They can appeal no later than June 1 to be considered for readmission for the upcoming fall semester.

**Unauthorized Withdrawal**—Students who leave the university without first obtaining permission to withdraw are considered to have resigned. In order to

be considered for readmission, students must submit a petition no later than July 1 for the fall semester and December 1 for the spring semester to the Committee on Examinations and Standing, in care of the Office of the Dean of Undergraduates, for readmission.

**Leave of Absence**—Students may request a leave of absence from the university by applying in writing to the Office of the Dean of Undergraduates at any time before the 1st day of classes in the semester for which they are requesting leave. A leave of absence taken after the 1st day of classes is considered a voluntary withdrawal.

To gain readmission following an approved leave of absence of not more than 4 semesters, students must notify the Office of the Dean of Undergraduates at least 1 month before the beginning of the semester that they intend to end their leave. The student also must include an academic plan approved by the Office of Academic Advising. After a leave of more than four semesters, students must submit a written application to the Committee on Examinations and Standing no later than July 1 for the fall semester and December 1 for the spring semester. The petition should include an academic plan approved by the Office of Academic Advising and two letters of support.

Approval of a leave of absence always is contingent on the student's satisfactory completion of course work in the semester preceding the leave. Students performing poorly may have their approved leave converted to suspension.

**Military Leave of Absence**—Students who require a leave of absence because of being called to active military duty should contact the Office of the Dean of Undergraduates.

**Completing Graduation Requirements Elsewhere**—Students planning to complete and transfer in remaining courses from another institution must first secure formal written approval from the Dean of Undergraduates. Transfer credit is subject to all Rice's transfer credit policies. All other graduation requirements apply, and the student is expected to adhere to all requirements and deadlines.

## APPLICABLE ACADEMIC GRADUATION REQUIREMENTS

Students enrolled in 4- (or 5-) year bachelor's programs may decide whether to follow the graduation requirements in effect when they first registered at Rice or those in effect when they graduate. If they graduate more than 7 (or 8) years after their initial registration, students must graduate under the regulations in effect at the time of their last readmission or those in effect when they graduate. Also, departments may review courses completed in a major more than 7 (or 8) years before the student's anticipated graduation. If the department concludes that a course no longer satisfies the requirements of the major, it is not credited toward the major program, although it remains on the student's record.

Departmental major requirements may vary from year to year during the period between a student's matriculation and graduation. The department may, at its discretion, make any of these variations available to a student for completion of the major requirements. If a new degree program or major is created during the student's time at Rice, the new program will be available to a student as if the program appeared in *General Announcements* at the time of matriculation.



## **NAME CHANGES**

To comply with a number of government agencies' reporting requirements, the university must record the name of each student who is a U.S. citizen as the student's name appears on his or her Social Security card. Students who need to change their names on Rice University records and who are U.S. citizens must notify the Office of the Registrar and present a Social Security card, marriage license, divorce decree or court order, and picture identification when submitting the form. After the change is implemented, the name on the Rice University transcript will read as printed on the supporting document(s).

## **CHANGE IN REGISTRATION**

The academic calendar lists deadlines for dropping or adding a class or section. This schedule is binding for all students. Adding or dropping a course, including transferring from one section to another or changing credit status in a course must be accomplished through completion of the appropriate forms and submission to the Office of the Registrar. Changing a course to/from audit must be done within the first 4 weeks of the semester. Students can request exceptions to these deadlines by petitioning the Committee on Examinations and Standing.

## **TRANSCRIPT POLICIES**

Official transcripts are issued only at the request of the student. Official transcript requests should be made at least 5 working days before the desired date of issue. A \$5 fee per transcript must be received before a transcript is issued.

Transcripts that have been presented for admission or evaluation of credit become a part of the student's permanent record and are not reissued. Transcripts from other institutions, if needed, must be sent to Rice University directly from the original issuing institution.

## **STUDENT RECORDS**

Rice University assures the confidentiality of student educational records in accordance with state and federal laws, including the Family Educational Rights and Privacy Act. Student academic records are maintained primarily in the Office of the Registrar and in the academic department of the student's major as well as in various other offices around campus. All students have the right to review their records to determine their content and accuracy, to consent to disclosures of personally identifiable information as defined by law, and to file complaints with the Department of Education.

## **RELEASE OF STUDENT INFORMATION FROM EDUCATIONAL RECORDS**

The disclosure or publication of student information is governed by policies of Rice University and the Family Educational Rights and Privacy Act.

A student's consent is required for the disclosure or publication of any information that is a) personally identifiable and b) a part of the educational record. However, certain exceptions to this general rule, both in types of information that can be disclosed and in access to that information, are allowed by the regulations of the Family Educational Rights and Privacy Act. Rice may allow access to personally identifiable information without a student's prior consent to its faculty or staff who legitimately require this information to perform their instructional, supervisory, advisory, or administrative duties.

In accordance with the law, a student's prior consent is not required for disclosure of portions of the educational record defined by the institution as

directory information. The following directory information may be released by the university:

1. Name, local and permanent address, telephone and mobile number(s), campus email address(es), and instant messenger address(es)
2. Date, place of birth, and gender
3. Classification and major and minor fields of study
4. Participation in officially recognized activities and sports
5. Weight and height of members of athletic teams
6. Dates of attendance, degrees and awards received
7. The most recent previous educational agency or institution attended by the student
8. Photographic image

The information above, designated by the university as directory information, may be released or published by the university without a student's prior written consent unless exception is made in writing by the student or the parents of a dependent student. Students who prefer to avoid access to or release of directory information must notify the registrar in writing before the end of the 2nd week of fall classes, and the university will withhold access to, or release of, directory information until further written instruction is received.

Students have a right to challenge the accuracy of their educational records and may file written requests to amend these records. The Office of the Registrar should be contacted for further information regarding the procedure to follow for questions or problems. Students have a right to file a complaint with the U.S. Department of Education concerning alleged failures by Rice University to comply with the requirements of FERPA. For more information regarding FERPA, please visit the U.S. Department of Education's website.

For complete information regarding Rice's policy on student education records, please contact:

**Rice University Registrar**  
 Rice University  
 Office of the Registrar-MS 57  
 6100 Main Street  
 Houston, TX 77005-1892  
 Email: registrar@rice.edu

## VETERANS INFORMATION

At Rice University, the Office of Veterans Affairs is managed through the Office of the Registrar. This office assists all veterans and their dependents who wish to receive Veterans Administration (VA) educational benefits. The office also provides personal counseling, fee deferments, tutorial assistance, and work-study jobs.

Veterans who are planning to attend the university should contact the Office of Veterans Affairs at least 2 months before the date of entry. Such time is required to expedite the processing of paperwork for educational allowances from the VA.

For certification of benefits, the student must be enrolled according to the following schedule:

Full Time .....	12 credits	1/2 Time .....	6 credits
3/4 Time .....	9 credits	Less than 1/2 Time ....	5 credits

For rate of monthly payment of educational allowances for veterans and dependents, please contact the Office of Veterans Affairs.

For additional informational regarding other veterans educational programs, contact the Office of the Registrar at 713-348-4999 or registrar@rice.edu.

## APPLICATION FOR GRADUATION

All students must complete and submit in a timely manner an Application for Graduation Form available in the Office of the Registrar. This form is required for all students who plan to complete their degree requirements at the end of the fall or spring semester.

## SUMMER SCHOOL FOR COLLEGE STUDENTS

Rice Summer School for College Students, administered by the Susanne M. Glasscock School of Continuing Studies, offers courses for credit to Rice students, visiting undergraduates, graduate students, and Class III students (see pages 75–76). Two summer sessions are offered: in May and in June–July. See Academic Calendar, pages vii–xiii. Taking 6 to 8 semester hours in 1 session is considered a full load. Interested students should complete the application form found on the summer school website at [scs.rice.edu/summercredit/](http://scs.rice.edu/summercredit/). Admission is automatic for any Rice undergraduate or graduate student in good standing. Visiting students in good standing should send official transcripts, including spring semester grades and a completed Dean of Students Recommendation form (mailed directly from their universities and colleges to the School of Continuing Studies) as well as the completed application. Acceptance in the Rice Summer School carries no implications for regular admission to Rice.

All applicants, including Rice students, should submit their applications to the Rice Summer School Office with the application fee and a tuition deposit. The remaining tuition is due in full at registration before the beginning of classes. Auditors of summer school courses, who are considered visiting students, must pay full tuition and fees. Limited financial aid in the form of private educational loans is available for Rice students only.

It is essential that students apply by the deadlines listed on the summer school website. Courses that do not generate enrollments sufficient to cover their costs may be canceled. Students may apply after the deadline (but before the start of classes) by paying a late fee.

For more information, including tuition and registration information, students should contact the Rice Summer School Office at 713-348-4803, via email at [scsummer@rice.edu](mailto:scsummer@rice.edu), or online at [gscs.rice.edu/summercredit/](http://gscs.rice.edu/summercredit/).

## ADMISSION OF NEW STUDENTS

Dating back to the founding of Rice University, our first president, Edgar Odell Lovett, mandated that we aspire to be a world-class university of the highest standing. Dr. Lovett challenged us “to assign no upper limit to our educational endeavor.” He envisioned students and faculty as a community of scholars, their minds exercised by spirited discourse (John Boles, *A University So Conceived: A Brief History of Rice*, p. 17, third rev. ed. 2006). Therefore, as an integral part of the university’s mission, we seek a broadly diverse student body where educational diversity increases the intellectual vitality of education, scholarship, service, and communal life at Rice. We seek students, both undergraduate and graduate, of keen intellect and diverse backgrounds who not only show potential for success at Rice, but also who will contribute to the educational environment of those around them. Rice determines which group of applicants, considered individually and collectively, will take fullest advantage of what we have to offer,

contribute most to the educational process at Rice, and be most successful in their chosen fields and in society in general. Our evaluation process employs many different means to identify these qualities in applicants. History shows that no single gauge can adequately predict a student's preparedness for a successful career at Rice. For example, we are cautious in the use of standardized test scores to assess student preparedness and potential. An applicant is considered in competition with all other applicants. In making a decision to admit or award financial aid, we are careful not to ascribe too much value to any single metric, such as rank in class, grade point average, the SAT/ACT, or Graduate Record Exam.

We use a broader perspective that includes such qualitative factors as the overall strength and competitive ranking of a student's prior institution, the rigor of his or her particular course of study, letters of recommendation, essays, responses to application questions, and (where required) auditions and portfolios. Taken together with a student's academic record and test scores, these additional factors provide a sound basis to begin assessing the applicant's potential on all levels.

Beyond indicators of academic competence, we look for other qualities among applicants, such as creativity, motivation, artistic talent, and leadership potential. We believe that students who possess these attributes in combination with strong academic potential will contribute to, and benefit from, a more vibrant, diverse educational atmosphere. Through their contributions and interactions with others, students will enrich the educational experience of all faculty and students. These qualities are not revealed in numerical measurements, but are manifest in the breadth of interests and the balance of activities in their lives.

Rice University strives to create on its campus a rich learning environment in which all students will meet individuals whose interests, talents, life experiences, beliefs, and world views differ significantly from their own. We believe that an educated person is one who is at home in many different environments, at ease among people from many different cultures, and willing to test his or her views against those of others. Moreover, we recognize that in this or any university, learning about the world we live in is not by any means limited to the structured interaction between faculty and students in the classroom, but also occurs through informal dialogue between students outside the classroom.

To encourage our students' fullest possible exposure to the widest possible set of experiences, Rice seeks through its admissions policies to bring bright and promising students to the university from a range of socioeconomic, cultural, geographic, and other backgrounds. We consider an applicant's race or ethnicity as a factor in the admission process and believe that racial and ethnic diversity is an important element of overall educational diversity. Though race or ethnicity is never the defining factor in an application or admissions decision, we do seek to enroll students from underrepresented groups in sufficient and meaningful numbers as to prevent their isolation and allow their diverse voices to be heard. We also seek students whose parents did not attend college as well as students from families with a well-established history of college-level education. Rice places a premium on recruitment of students, regardless of their races or ethnicities, who have distinguished themselves through initiatives that build bridges between different cultural, racial, and ethnic groups. In so doing, we endeavor to craft a residential community that fosters creative, intercultural interactions among students, a place where prejudices of all sorts are confronted squarely and dispelled.

In assessing how well an applicant can contribute to enlivening the learning environment at Rice, we also try to determine the relative challenges that he or she may have faced. For economically disadvantaged students, this may mean achieving a high level of scholastic distinction while holding down a job in high school. For a first generation college student, it might mean achieving high standards for academic success within an environment relatively indifferent to intellectual attainment. Or it might mean overcoming a disability to excel in sports, music, or forensics. For students who do not have particular disadvantages, we also look at whether they chose a more challenging road than the normal path through high school. This might mean an especially strenuous course of study, a prolonged, in-depth engagement in a school project, or a particularly creative and wide-ranging set of extracurricular activities.

Rice does not view offers of admission as entitlements based on grades and test scores. Our admission process combines an examination of academic ability with a flexible assessment of an applicant's talents, experiences, and potential, including potential diversity contributions; it precludes any quick formula for admitting a given applicant or for giving preference to one particular set of qualifications without reference to the class as a whole. Rice is a highly selective institution and receives many more applications from viable candidates than it has available spaces. An inevitable consequence of Rice's approach is that some highly accomplished students will not be admitted. However, by selecting a wide range of matriculants of all types, the admissions process seeks to enrich the learning environment at Rice and thus improve the quality of a Rice education for all students.

Due to the nature of the Rice education, Rice enrolls undergraduate degree candidates on a full-time basis only. **First-year applicants, architecture applicants, and international students may apply for the fall semester only.** Other applicants may apply to enter either the fall or spring semester.

Applicants are selected on a competitive basis in 6 academic divisions: architecture, engineering, humanities, music, natural sciences, and social sciences. Candidates should give careful consideration to the category under which they wish to be considered. However, once enrolled, students are able to move freely among most divisions after consultation with their advisors. Music students must pursue the music program for at least the 1st year before changing divisions. The schools of music and architecture maintain limited enrollments; all majors are subject to faculty approval.

Those offered admission are expected to complete the remainder of their high school courses with the same superior performance that led to their admission.

## FIRST-YEAR APPLICANTS

There are 4 areas of focus generally used in evaluation of first-year candidates for admission: scholastic record as reflected by the courses chosen and the quality of academic performance, recommendations from high school, the application presentation of personal information and essays, and standardized testing (the SAT or the ACT with the writing test and 2 SAT Subject Tests).

**The High School Record**—Students must complete at least 16 college preparatory units as follows:

English	4	Laboratory science (e.g., biology, chemistry, physics)	2
Social studies	2	A foreign language	2
Mathematics	3	Additional credits in any of the categories above	3

The natural science and engineering divisions require trigonometry (precalculus) or other advanced mathematics courses and both chemistry and physics.

Students may substitute a 2nd year of chemistry or biology for physics.

Students admitted with academic deficiencies will be asked to complete the required work by taking high school or college-level courses during the summer before enrollment at Rice.

**Note: Because of the admission competition to enter Rice, successful applicants generally have taken 20 or more college preparatory courses in high school, many at the college level. Therefore, only those students who have more than 20 college preparatory courses may have the registrar consider for Rice credit their college courses taken in high school.**

**Transfer of Coursework Taken During High School**—College-level courses taken during high school years may be considered for credit at Rice University on receipt of the following documentation:

1. An official transcript of all college courses sent directly from the college(s) attended. College-level courses that appear on the high school transcript will not yield credits at Rice.
2. From each college attended, official verification that all courses were taken on the college campus, were taken together with students at that college, were taught by regular members of the college faculty, and were a part of the normal curriculum of the college.
3. Official notification by letter from the high school principal or guidance counselor that the credit earned was not used to meet high school diploma requirements.

**Recommendations**—Candidates must submit evaluations from their guidance counselor and 1 teacher. The necessary forms are included in the Common Application at [www.commonapp.org](http://www.commonapp.org).

**The Application**—Rice is an exclusive user of the Common Application. The application and the Rice Supplement provide the committee with important information on the student's background and gives the applicant an opportunity to provide statements on his or her interests, experiences, and goals. *The application fee is \$60.* Students for whom this fee creates a hardship may apply for a waiver. Freshman applicants should provide proof of a fee waiver for the SAT or ACT test or eligibility for the school lunch program. In any case, a letter from the student's high school counselor is required. Financial stress created by application fees to other institutions is not considered a valid reason to grant a fee waiver.

**Standardized Testing**—The SAT or the ACT with the writing test and 2 SAT Subject Tests are required for admission. All applicants must submit two SAT Subject Tests in fields related to the candidate's proposed division of study.

These exams are administered by the College Board and the American College Testing Program. Bulletins and test registration forms are available from high school counseling offices. The applicant is responsible for arranging to take the tests, and official score reports must be submitted before the student can be considered for admission. The College Board code for Rice is 6609. The ACT code is 4152.

**Personal Interview**—Although a personal interview is *not a requirement*, we *recommend* an interview for first-year applicants as an excellent opportunity to discuss the applicant's interests, needs, and questions. On-campus interviews are conducted by the admission staff and a select group of Rice senior students. Off-campus interviews are conducted throughout the United States and abroad by Rice alumni. The Committee on Admissions makes no distinction between on-campus and off-campus interviews. Please consult the university website, or call the admission office for details.

**Music Audition**—Candidates to the Shepherd School of Music must arrange for an audition with a member of the music faculty.

**Architecture Portfolio and Interview**—Architecture applicants must submit a portfolio. An on-campus interview with a faculty member from the School of Architecture is strongly recommended.

## DECISION PLANS

**Early Decision Plan**—Early Decision is a binding decision plan designed for students who have selected Rice as their 1st choice. Students may initiate applications to other colleges under nonbinding plans but must withdraw those applications if admitted to Rice.

Early Decision applicants must complete the required standardized testing prior to or by the November testing dates in their senior year. All other materials should be submitted by November 1. Admission notices will be mailed by mid December. The committee will admit, defer, or deny Early Decision applicants. Deferred applicants are considered with the Regular Decision pool.

**It is important to note that, if admitted under Early Decision, a candidate must withdraw all other college applications, may not submit any additional applications after accepting the offer, and must accept Rice's offer of admission by submitting a \$300 nonrefundable deposit by January 2.** An additional \$100 housing deposit is required of those desiring on-campus accommodations.

Those accepted under Early Decision who demonstrate financial aid eligibility will receive a financial aid package in the admission packet. To apply for need-based aid, Early Decision applicants must submit the College Scholarship Service Profile and the student and parent 2006 income tax and W-2 forms by November 15, 2007. Register for the CSS PROFILE at [www.collegeboard.com](http://www.collegeboard.com). Students will complete the PROFILE online. The PROFILE number for Rice is 6609.

**Regular Decision Plan**—Students who apply Regular Decision must submit their materials by January 2 to receive notification by April 1. Candidates who miss the deadline must do so in full knowledge that they are in a less competitive position. Regular Decision applicants must complete their standardized tests by December of their senior year of high school.

Regular Decision applicants who are offered admission should submit a \$300 enrollment deposit by May 1 to reserve their places in the incoming class. Those who desire a room on campus must pay an additional \$100 deposit. After May 1, deposits are not refundable.

## ACCELERATED STUDENTS

Rice University will accept applications from students who are completing high school in less than 4 years. It is important to note that these students will compete with other candidates who will be completing 4 years of high school. Therefore, it is the candidate's responsibility to demonstrate that he or she has exhausted *all* college preparatory course work at his or her school. Further, because of the residential focus and commitment to student self-governance at Rice, candidates must also demonstrate the maturity and personal development that would allow them to participate fully and responsibly in campus life. Because of the unique circumstances surrounding the accelerated student, it is strongly recommended that these candidates have an on-campus interview before the application deadline.

## HOME-SCHOOLED APPLICANTS

The Committee on Admission and Financial Aid recognizes that each home-schooled applicant is in a unique educational program. To ensure that our evaluation process is fully informed, each home-schooled applicant is encouraged to provide clear, detailed documentation of his or her curriculum of study, assessment tools, and learning experiences. Rice requires 1 Teacher Evaluation and a School Report from all applicants. Either the School Report or the Teacher Evaluation must be from someone not related to the student.

## TRANSFER STUDENTS

Students with superior records from 2-year or 4-year colleges or universities may apply as transfer candidates. Applicants for transfer admission must file the following with the Office of Admission:

- The Transfer Common Application and the Rice Supplement
- Official transcripts of all high school and college work completed to date as well as courses in progress
- Two faculty recommendations
- A recommendation from the dean of students
- SAT or ACT scores
- A \$60 application fee

Applications with the appropriate documents must be submitted by March 15 for fall term admission and October 15 for spring term admission. Notification of the admission decision is mailed by May 15 and December 15, respectively. The criteria used in evaluating transfer applications are similar to those applied to applicants for the first-year class, except that special emphasis is given to performance at the college level. Because of the highly competitive nature of transfer admission, it is recommended that applicants have a minimum 3.20 (4.00 scale) grade point average on all college work. The SAT or ACT must be taken by March 15 for fall application and October 15 for spring application. The SAT Subject Tests are not required.

**International transfer students are eligible to apply to the fall semester only.**

Students for whom the \$60 application fee creates a hardship may apply for a waiver. Transfer applicants must send a copy of the Student Aid Report that they receive after completing the Free Application for Federal Student Aid (FAFSA) along with a request for a fee waiver to the Office of Admission. Financial stress created by application fees to other institutions is not considered a valid reason to grant a fee waiver.

Transfer students must be registered in residence at Rice for at least 4 full semesters during the fall or spring terms and must complete no fewer than 60 semester hours before earning a Rice degree.

## ADVANCED PLACEMENT/INTERNATIONAL BACCALAUREATE/ INTERNATIONAL CERTIFICATE PROGRAMS

**Advanced Placement**—Students who score a 4 or 5 on the applicable Advanced Placement College Board examinations taken before matriculation at Rice are given university credit for the corresponding Rice course(s).

**International Baccalaureate**—Students who complete the International Baccalaureate diploma and receive a score of 6 or 7 on a higher-level IB exam will receive course credit for the corresponding Rice course(s).



**International Certificate Programs**—Students who have completed various international certificate programs may receive course credit for corresponding Rice courses; however, each student's documentation will be reviewed individually and on a case-by-case basis. The General Certificate of Education A-Level (United Kingdom), the Abitur (Germany), and the Baccaalaureate (France) are eligible for review.

## OTHER STUDENTS

*Please note that financial assistance is not available for visiting, Class III, second degree, dual enrollment, or auditing students.*

**Visiting Students**—Students who wish to spend a semester or a year at Rice taking courses for credit to be applied toward their undergraduate degree at another school may apply for admission as visiting students through the Office of Admission. The student's application should be accompanied by the \$60 application fee, an official high school transcript, an official transcript of college work to date, an SAT or ACT score, and recommendations from the dean of students and a faculty member who has taught the student within the past academic year. Visiting student applications should be submitted by March 15 for the fall semester and October 15 for the spring semester.

Visiting students are assigned membership to one of the residential colleges during their stay and are charged the same fees as other undergraduates. In a few classes where enrollment is limited because of space or other considerations, candidates for Rice degrees have priority over visiting students for registration.

**Visiting students may apply to transfer to Rice only after having left Rice for at least 1 semester.**

**Class III Students**—Students with Class III standing at Rice have an undergraduate or graduate degree from an accredited college or university and are taking courses at Rice for credit but not in a specific degree program. Students interested in this program should contact the Office of Graduate and Postdoctoral Studies.

**Second-Degree Students**—An individual who has a bachelor's degree from another institution and desires another degree in a different area of focus may apply as a second-degree student on a space-available basis. Students may only pursue a second degree that is significantly different from their first degree. The application, a \$60 application fee, official transcripts of all undergraduate and graduate work, a final high school transcript, two faculty letters of recommendation and a recommendation from the dean of students from the most recent college attended, and standardized test scores (the SAT or ACT) are required to complete an application file. The deadline for fall semester admission is March 15, and the deadline for spring is October 15. Second Degree applications are available on the admission Web site.

Second degree applicants with a prior bachelor's degree from Rice should apply to the registrar. The application should include a written statement specifying the proposed major and course program for the 2nd degree, a supporting letter from the chair of the major department, and an explanation of the student's reasons for seeking a second degree.

**Dual Enrollment Students**—Accelerated high school juniors and seniors who have taken all the courses in a given discipline available to them in high school may request admission to Rice for the purpose of taking courses as dual enrollment students. This enrollment is restricted to a maximum of 2 courses per semester per student. The written application, application fee of \$60,

high school transcript, a teacher and a counselor recommendation from the applicant's high school, and an SAT or ACT score should be sent to the Office of Admission by June 1 for the fall semester or by December 1 for the spring semester. Home-schooled students must demonstrate that they have exhausted all other community resources before applying for dual enrollment at Rice. Dual Enrollment applications are available on the admission Web site.

Tuition for new students is \$1,184 per semester hour plus a \$125 nonrefundable registration fee. Tuition for returning dual enrollment students would be the rate (plus increases) at which they first took dual enrollment courses at Rice. These charges are for the 2007–08 school year and are subject to change in subsequent years. Financial assistance is not available for this program.

**Auditors**—Any interested person, including currently enrolled students, may audit 1 or more courses at Rice by securing permission of the instructor and by registering as an auditor with the registrar. The university grants no academic credit for such work. The audited course will appear on the student's transcript with the designation AUD. Currently enrolled students may audit courses without charge. Rice alumni are charged a fee of \$315 per course per semester. All others are charged \$620 per course per semester for the privilege of auditing. Request to audit a class or to change from audit to credit or vice versa must be done by the end of the 4th week of the semester.

## TUITION, FEES, AND EXPENSES

Charges for tuition, fees, and room and board are billed to students each semester. Students may pay the charges in full by the due date or in installments over the course of the semester. The fall semester due date is August 1 for first-year and mid-August for all others, and the spring semester due date is the 1st week of January. The following costs apply to undergraduates in the 2007–08 school year:

<b>Tuition</b>	<b>Annual</b>	<b>Semester</b>	<b>Hour<sup>2</sup></b>
Entering 1st-year and transfer students	\$28,400	\$14,200	\$1,184
Students matriculating in 2006–2007	27,930	13,965	1,164
Students matriculating in 2005–2006	25,930	12,965	1,081
Students matriculating in 2004–2005	24,270	12,135	1,012
Students matriculating in 2003–2004 <sup>1</sup>	21,500	10,750	896

<sup>1</sup> Tuition indexed for 5 years from year of matriculation

<sup>2</sup> By special permission only

<b>Required Fees</b>	<b>Fall</b>	<b>Spring</b>	<b>Annual</b>
Student activities <sup>3</sup>	\$ 45.65	\$ 45.65	\$ 91.30
Health services	207.00	207.00	414.00
<b>Total fees</b>	<b>\$252.65</b>	<b>\$252.65</b>	<b>\$505.30</b>

<sup>3</sup> 5th-year students in professional degree programs and students working toward a 2nd bachelor's degree pay a reduced student activities fee of \$6.85 per semester, which covers the Student Association, Student Organizations Activity, University Court, and Honor Council portions of the activity fee.

<b>Orientation Week Fees</b>	<b>Fall</b>
O-Week Room and Board–Freshman	\$250.00
O-Week Activity Fee–Freshman	195.00

<b>Room and Board</b>	<b>Annual</b>	<b>Semester</b>
Room	\$6,750	\$3,375
Board	3,500	1,750

Telecommunication	144	72
Off-Campus Board-Plan-'05	1,380	690
Off-Campus Board-Plan-'06	1,020	510

Any undergraduate who matriculated prior to fall 2003 and withdraws or takes an approved leave of absence and then gains readmission to the university pays the tuition applicable at their matriculation, plus annual Consumer Price Index increases for a period not to exceed 5 years. After 5 years, students pay the tuition applicable to the entering class. Indexing does not apply to classes entering after spring 2003.

## REFUND OF TUITION AND FEES

Students who withdraw during the first 2 weeks of the semester are not charged tuition or fees for that semester. Students who withdraw during the 3rd week must pay 30 percent of the semester's tuition, receiving a 70 percent refund. The amount of the refund drops by 10 percent at the beginning of each successive week that passes before withdrawal until the 9th week, after which no refund is made. Federal regulations require a refund calculation for all students receiving Title IV funds. The length of time during which a refund must be calculated is up to 60 percent of the payment period (semester). If a student withdraws on or before the 60 percent point in time, a portion of the Title IV funds awarded to a student (Pell Grant, Federal SEOG, Federal Perkins Loan, Federal Subsidized and Unsubsidized loans, Federal PLUS Loans, the Texas LEAP Grant) must be returned, according to the provisions of the Higher Education Act as amended. The calculation of the return of these funds may result in the student owing a balance to the university and/or the Department of Education.

For students withdrawing after the 2nd week of classes in a semester, fees or special charges (see page 45) are not refunded. Similarly, students withdrawing or taking leaves of absence in the spring semester do not receive a partial refund of fees paid for the full year. Students withdrawing at any time forfeit the \$300 enrollment deposit they paid as incoming students.

Students who receive approval to enroll with a course load of fewer than 12 hours and do so within the first 2 weeks of the semester will be charged at the per hour rate plus a part-time registration fee. There are no refunds for part-time enrollment after the first 2 weeks of the semester.

Students unable to resolve with the cashier's office any request for special consideration in connection with waivers, refunds, or adjusted payments on tuition, fees, and other charges should forward their appeals to the dean of undergraduates. Exceptions are granted by the dean of undergraduates only under extraordinary circumstances.

## LIVING EXPENSES

Residence fees cover dining hall costs and residence maintenance. They are established each year as needs dictate. For 2007-08, the annual room and board charge for residence in a residential college is \$10,250. This charge includes the room and all the meals eaten during the year.

**Housing**—About 71 percent of Rice undergraduates live in the on-campus residential colleges. Information about the residential colleges and room application forms accompany the notice of admission sent to each new undergraduate. Room reservations cannot be made before notification of admission. Further information on housing in the residential colleges is available from the Office of the Dean of Undergraduates, and information on off-campus

housing is available from by the Office of Academic Advising.

When they receive their residential college room assignments for the academic year to follow, students must sign a housing agreement. To reserve their space, current students must sign a housing agreement by the date established in their respective colleges but no later than April 15. New students must make a \$100 deposit before May 1. These nonrefundable deposits are applied to the following semester's room and board charges.

**Board**—Meals are served cafeteria-style. The colleges provide 3 meals per day Monday through Friday, continental breakfast and brunch on Saturday, and lunch and dinner on Sunday. Meals are not served during the Thanksgiving holiday, at the midyear break, or over the spring midterm recess. More information is available from the residential dining website ([food.rice.edu](http://food.rice.edu)).

**Payments and Refunds**—Students may pay their residence fee in installments. The exact amounts and due dates appear on the statement mailed from the Cashier's Office. Students moving out of the college for any reason receive a refund (or a credit) of the reduced balance of room and board charges but must still pay a termination processing fee. Possible exceptions such as academic suspension, Rice-sponsored study abroad, and family emergencies are treated on a case-by-case basis.

### SPECIAL CHARGES

The following charges are separate from the regular fees. For charges because of late registration or course changes made after the deadlines, see Registration (pages 22–23).

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Preceptorship per semester . . . . .	\$230
Internship per semester . . . . .	.230
Study abroad fee per semester . . . . .	.250
Late payment penalty . . . . .	.140
Undergraduate application fee. . . . .	60
Part-time registration fee. . . . .	.125
Orientation Week room and board (coordinators) . . . . .	.180
Late registration fee 1 . . . . .	70
Late registration fee 2 . . . . .	.120
Deferred payment plan late fee . . . . .	35
College withdrawal: suspension . . . . .	.100
College withdrawal: breaking of lease . . . . .	.700
Diploma fee: sheepskin. . . . .	.115
Diploma fee: parchment . . . . .	40
Diploma fee: facsimile. . . . .	15
Diploma mailing fee: domestic . . . . .	30
Diploma mailing fee: air mail . . . . .	35
Transcript fee . . . . .	5
Replacement ID . . . . .	10
Readmission fee after withdrawal for nonpayment. . . . .	.300

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### HEALTH INSURANCE

All Rice students must have health insurance. Students may purchase insurance for the 2007–08 school year through the university program developed for Rice students at a yearly premium of \$2,193. Coverage is effective from 12:01 AM, August 15, 2007, until 12:01 AM, August 15, 2008. Dependent coverage also is available. A description of the policy, application form, and waiver form can be found on the Web at [studenthealthinsurance.rice.edu](http://studenthealthinsurance.rice.edu). Students should submit either the application or waiver by August 15 each year.

## EDUCATION CERTIFICATION PROGRAM FEES

Students enrolling in the student teaching apprenticeship or internship plans must pay a \$230 registration fee for each semester. An additional \$25 fee (paid to the School of Continuing Studies) is due for each summer school session.

## DELINQUENT ACCOUNTS

Students in arrears on their financial obligation to Rice as of the last day to add courses for any semester may be withdrawn. The university will not issue certificates of attendance, diplomas, or transcripts at any time for a student whose account is in arrears.

Students who have not made satisfactory arrangements with the cashier for payment of current charges or who have moved on campus without a proper room contract may be withdrawn from the university.

## TRANSCRIPTS

Transcripts are issued on written request to the Office of the Registrar. The registrar does not issue transcripts without the consent of the individual. The charge of \$5 for each copy is payable in advance. Those requesting transcripts by mail should include payment with the request.

## FINANCIAL AID

The financial aid programs at Rice provide assistance to meet demonstrated need for university attendance for all admitted students. Through grants, endowments, low-interest loans, campus work opportunities, or a combination of these programs, Rice makes every effort to provide students and families assistance to meet their educational expenses. The financial aid program receives funding from many sources. Rice uses contributions from alumni and friends to establish and maintain scholarships and loan funds. Federal and state grant, work, and loan programs also provide funds. Awards are based primarily on financial need and a computed Expected Family Contribution (EFC), although there also are attractive loan opportunities for students and families who demonstrate no need.

The university determines need for first-time students by having them complete the College Scholarship Service (CSS) PROFILE. Students register for CSS PROFILE by visiting its website at [www.collegeboard.com](http://www.collegeboard.com). Students will complete the PROFILE online. The PROFILE number for Rice is 6609. First-time students also complete the Free Application for Federal Student Aid (FAFSA). The FAFSA school code for Rice is 003604. Student and parent income tax document, including W-2 forms, are required to be submitted to The College Board using Institutional Documentation (IDOC) Service.

The university determines need for continuing students by having them complete the FAFSA and the PROFILE; continuing students also submit student and parent income tax and W-2 forms to The College Board.

“Need” is the amount required to meet the difference between each student’s basic educational expenses and his or her family’s resources. Parents are expected to contribute according to their financial means, taking into account income, assets, home equity, number of dependents, and other relevant factors. Students are expected to contribute as well from their own assets and earnings, including appropriate borrowing against future earnings.

The brochure *Financing Your Education* explains the assistance programs in detail. Copies are available from the Office of Admission.

## NEED-BASED APPLICATION PROCESS

Rice University is a need-blind school. Applicants are admitted to the university regardless of their family's ability to pay for college. Rice will meet 100% of demonstrated financial need as determined by university calculations.

Rice considers applicants for all appropriate assistance administered by the university, including grants, scholarships, loans, and work. Students receive notification of an offer after their financial aid files are complete. Student Financial Services provides financial assistance only for coursework sponsored through Rice University.

To apply for financial assistance, first-time students (including Early Decision students) must submit the following:

- CSS PROFILE, priority date March 1
- Free Application for Federal Student Aid (FAFSA), priority date March 1
- Student and parent income tax and W-2 forms, priority date March 1

**Continuing students must submit the following:**

- FAFSA, priority date April 15
- CSS PROFILE, priority date April 15
- Student and parent income tax and W-2 forms, priority date April 15

## DECISION

Financial aid offers are made annually. Award amounts are specified in the financial aid offer letter. Because financial circumstances change from year to year, Rice conducts an annual review of need and offers aid accordingly. For this reason, continuing students must complete CSS PROFILE, file the FAFSA, and submit parent and student tax documents every year that they seek assistance.

The university, from time to time, may adjust its methods of computing financial need or its policies regarding the types of financial assistance that it offers so as to meet the financial needs of the largest possible number of students. Therefore, the amount and type of financial aid may change from year to year, even when the student's financial situation appears to remain relatively stable.

## TYPES OF FINANCIAL AID AND ASSISTANCE

**Need-Based Scholarships/Grants**—Various need-based scholarships and grants are awarded to assist students with demonstrated need.

**Merit Scholarships**—Merit Scholarships are offered through the Office of Admissions to incoming students. Merit scholarships may only be used for coursework sponsored by Rice University. Should a student with a merit award graduate early, unexpended merit funds will not be granted to the student.

**Student Loan Funds**—To assist students and parents with educational financing, the Office of Student Financial Services participates in the following programs:

- **Stafford Student Loans**—These are low-interest loans made to students attending school on at least a half-time basis. Subsidized Stafford loans require need-based financial aid eligibility, but unsubsidized Stafford loans are available to all students.
- **Parent Loans for Undergraduate Students (PLUS loan)**—The PLUS loan is a low-interest loan to parents or legal guardians of dependent undergraduate students. Eligibility is not based on demonstrated financial need.

- **Federal Perkins Loan Program**—These are low-interest loans made to students attending school on at least a half-time basis and who demonstrate high need.
- **Private Education Loans**—These nonfederal loans are available to students attending school on at least a half-time basis. Eligibility is not based on financial need. These are credit-based loans and may require a co-signer.

A few endowments for student loans have been established at Rice primarily as memorial tributes. These funds exist separately from the normal financial aid program. Rice uses them to make small emergency loans to students experiencing unexpected financial problems or showing additional need beyond regular eligibility.

All requests for these loans must be submitted to the Office of Student Financial Services.

**Student Employment Programs**—Opportunities for employment are available to students, either on or off campus, during the academic year. Students are eligible to work under the Federal Work-Study Program or the Rice University Work Program. Students interested in employment should access the Student Financial Services webpage at [www.ruf.rice.edu/~fina/](http://www.ruf.rice.edu/~fina/).

**Deferred Payment Plan**—Rice offers a deferred payment plan to enable families to finance students' educational costs. This plan divides each semester's charge over 4 installments. Details are available to eligible students each semester at the time of billing. Students arrange for deferred payment through the Cashier's Office.

**Summer Aid**—Students who have not exceeded 10 semesters at Rice are eligible to apply for summer aid. The only aid available during the summer session are private educational loans.

## FINANCIAL AID ELIGIBILITY

Undergraduate students are eligible to apply for need-based Rice sponsored and federal/state/private aid during the first 8 semesters at Rice; for transfer students the number of semesters is prorated based on the number of hours transferred. If a student is enrolled beyond 8 semesters, the student may apply for federal/state/private aid for an additional 2 semesters. (Architecture students may apply for Rice sponsored aid for 2 semesters following their preceptorship to complete the architecture degree.) If a student attends part time during a semester or withdraws during a term, the semester is counted toward the number of semesters aid is available.

## LOAN COUNSELING

Students who are recipients of federal student loans will be required to complete online loan entrance counseling before funds will be credited to student accounts. Students also will be required to complete online exit counseling at the completion of a program of study at Rice. Failure to complete online loan exit counseling will result in a transcript hold.

## SATISFACTORY ACADEMIC PROGRESS

The Higher Education Act of 1965, as amended by Congress, mandates that institutions of higher education require minimum standards of "satisfactory academic progress" for students to be eligible to receive financial aid.

To remain in good standing, an undergraduate student must meet the following qualitative and quantitative standards:

**Qualitative**—A student must earn a minimum term GPA of 1.67 for each term enrolled at Rice University.

**Quantitative**—By the end of each academic year, a student must have earned a minimum of 24 credits. If a student was enrolled for only 1 term, the student must have earned a minimum of 12 credits.

If a student fails to meet either standard, the next term the student is enrolled the student will be granted aid on a probationary status. During a term in which a student is on financial aid probation, the student must complete a minimum of 12 credits and must earn a term GPA of 1.67 to be considered in good standing and to be eligible to receive aid for the next term enrolled. If a student on financial aid probation does not complete these requirements, then the student's financial aid eligibility is terminated.

**Appeal**—A student whose aid eligibility has been terminated after 1 semester of financial aid probation may submit an appeal in writing to Student Financial Services for a 2nd term of financial aid probation. If during that 2nd probation term the student fails to complete 12 credits and earn a term GPA of 1.67, the student's aid eligibility is terminated, and the student may not appeal for another probationary aid term. In order to regain aid eligibility, the student must complete 12 credits in 1 term with a 1.67 term GPA (or 2.0 GPA at a school without weighted grades) using resources other than aid offered through Rice University to pay affiliated charges.

**Financial Aid After Suspension**—Students who have been suspended by the university for academic reasons need to be aware that if they are readmitted by the Committee on Examinations and Standing they may not be eligible for financial aid based on their prior academic performance. Students who are petitioning for readmission are advised to contact Student Financial Services to determine their aid eligibility.

## RETURN OF TITLE IV FUNDS

Students who receive federal funds as part of their aid packages and do not complete the academic term may be subject to returning a portion of those funds. Contact Student Financial Services for information about "Return of Title IV Funds" policies and procedures.

## HONOR SOCIETIES

Honor societies at Rice include the following:

**Phi Lambda Upsilon**—national honorary chemical society promoting high scholarship and original investigation in all branches of pure and applied chemistry (Rice chapter: 1926)

**Phi Beta Kappa**—founded in 1776 at the College of William and Mary to recognize intellectual achievement and the love of learning among students in the liberal arts and sciences (Rice chapter: March 1, 1929)

**Pi Delta Phi**—organized to interest French students in competing for high standing in scholarship (Theta chapter at Rice: May 1930)

**Society of Sigma Xi**—for the promotion of research in science (Beta of Texas chapter at Rice: March 23, 1938)

**Tau Beta Pi Association**—organized to interest engineering students in competing for high standing in scholarship (Gamma of Texas chapter at Rice: December 18, 1940)

**Delta Phi Alpha**—to promote an interest in the German language and literature (Gamma Xi chapter at Rice: April 1949)



**Sigma Delta Pi**—to promote an interest in the Spanish language and literature (Rice chapter: May 14, 1953)

**Tau Sigma Delta**—national honor society in architecture and applied arts (Tau chapter at Rice: May 7, 1961)

**Eta Kappa Nu**—founded in 1904 at the University of Illinois for electrical engineering students to stimulate and reward scholarship as well as assist and encourage its members to grow professionally throughout their lives (Rice chapter: January 1981)

**Omicron Delta Epsilon**—to promote study in economics (Rice chapter: 1981)

**Psi Chi**—founded in 1929 at Yale University to encourage, stimulate, and maintain excellence in scholarship and to advance the science of psychology (Rice chapter: April 23, 1990)

**Chi Epsilon**—the Civil Engineering Honor Society. It serves to recognize students of high scholarship, character, practicality, and sociability. Students are inducted into the society once or twice annually and are selected from the pool of upper division level civil engineering students. (Rice chapter: 1995)

## UNDERGRADUATE STUDENT LIFE

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### RESIDENTIAL COLLEGES

All undergraduate students at Rice, whether they live on campus or not, are members of 1 of 9 residential colleges. All colleges are coeducational.

Each college has faculty masters who live in a house next to the college. Reporting to the dean of undergraduates, the masters have overall responsibility for all aspects of student life in the college, especially for encouraging broad cultural and intellectual interests and for promoting self-discipline and effective self-government within the college. Upon agreement, the students and masters invite other members of the Rice faculty to become resident and nonresident associates of the college. Faculty associates act as advisors to the students and participate in the various activities of the college. Colleges also have nonfaculty university associates and community associates drawn from various professions in the Houston area.

Each college exists as a self-governing group of students. The elected officers and representatives are responsible to the masters and to the college membership for:

- Directing the college's cultural, social, and athletic activities
- Expenditure of college funds
- Maintaining order in the college

While uniformity among the colleges has never been sought and each college has developed its own particular interests and character, all seek to foster fellowship among their members and a mature sense of honor, responsibility, and sound judgment.

**College Assignment**—Each undergraduate, upon acceptance by the university, is designated a member of one of the colleges. Two students entering Rice for the first time may request assignment to the same college, but they may not designate which college. New students also may request membership in the same college as a close relative. Except for these cases, students have no individual choice of college.

**Room and Board**—College buildings include a dining hall and public rooms, which are available to both resident and nonresident members, and living

quarters for approximately 225 students from all classes and all academic disciplines.

At present, Rice has room in its on-campus residential colleges for about 71 percent of its undergraduate students. Although most of the students who want to live in the colleges can be accommodated, demand usually exceeds the available number of rooms. The university makes every effort to provide housing in the colleges for all incoming first-year students who wish to live on campus, but space cannot be guaranteed. Continuing students draw for rooms according to the priority system established in each college. No student is required to live on campus; however, those members of the colleges who live off campus are encouraged to eat in their colleges and to participate in college activities.

The College Food Service provides à la carte meals, with the exception of prepaid dinners. Its other services include:

- Assistance with special diets prescribed by a physician
- Sack lunches for students who must miss a meal due to a job conflict
- Sick trays for students when requested by the Student Health Service
- Alternate menu entrées, whenever possible, to accommodate students' religious practices

For more information on room and board, see page 46.

**College Courses**—One of the colleges' important activities is their sponsorship of courses and workshops open to all students. By expanding course offerings outside the traditional departments, college courses promote the academic involvement of the colleges while introducing students to interdisciplinary topics of particular interest.

Students propose college courses during the semester before they are offered. Once approved by the masters and faculty associates of the college and by the dean of undergraduates and the provost, these college courses are offered for academic credit on the same basis as departmental courses. The registrar provides a list of college courses each semester during preliminary registration.

## STUDENT GOVERNMENT

All undergraduates are members of the Rice Student Association, which is governed through the Student Senate. The senate includes the president, 2 vice presidents, the secretary, the treasurer, the 9 college presidents, and 9 college senators.

Alleged violations of university or college rules are handled in accordance with the Code of Student Conduct. In most cases, original jurisdiction belongs to student courts. Students may appeal verdicts to the college masters or the assistant dean for student judicial programs, as appropriate, with a final appeal to the dean of undergraduates. The student-staffed Honor Council conducts hearings and trials for alleged offenses against the honor system (see page 8). Rice retains ultimate authority in all matters of discipline and over all actions that affect its educational function or the safety and well-being of members of the university community.

**Award Presentations**—The Rice Student Association presents 2 coveted awards annually, one to a student and one to a faculty or staff member. The Rice Service Award, a memorial to Hugh Scott Cameron, first dean of students at Rice, is awarded to currently enrolled or former members of the association who have rendered distinguished service to the student body. The Mentor Recognition Award recognizes extraordinary service to the student body by a current member of the faculty or staff. A committee of faculty and students appointed by the association makes the selections.

## OFFICE OF STUDENT ACTIVITIES

The Office of Student Activities, located in the Rice Memorial Center cloisters, oversees the activities of various campuswide student organizations. It also handles student requests for facilities and party permits, and it coordinates leadership development programs, including the annual leadership retreat and symposium.

Principal student organizations include the following:

- Rice Student Association, the student governing body
- Rice Program Council, which sponsors various events of current interest to the student body as well as social functions
- KTRU, the student-run radio station, operating 24 hours, 7 days a week, on 91.7 FM
- Student publications (e.g., *Rice Thresher*, the student newspaper; *Campanile*, the yearbook; *The Rice Undergraduate: The Annual Academic Review*, a collection of peer-reviewed student papers; and *University Blue*, a literary and visual arts publication)

A large number of student organizations address special student interests, such as the Black Student Association, the Hispanic Association for Cultural Education at Rice, the Chinese Student Association, Rice Young Democrats, and Rice Republicans. There also are numerous clubs for such sports as sailing, rugby, lacrosse, volleyball, and soccer. Other special-interest groups include a premed society, forensic society, juggling club, and vegetarian club.

Many organizations are associated with special academic and professional disciplines, such as foreign language clubs, honor societies, and student affiliates of the American Chemical Society, the American Society of Civil Engineers, and the American Society of Mechanical Engineers.

The Rice Players, an extracurricular theater group of Rice students, faculty, and staff, present at least 4 productions each year and welcome participation by anyone interested in any aspect of theater production or management.

Rice students also maintain affiliations with a number of religious organizations. These include, but are not limited to, the Baptist Student Union, Canterbury Association, Catholic Student Association, Christian Science Organization, Hillel Society, Lutheran Student Association, Intervarsity Christian Fellowship, and the Wesley Foundation. Many of these clubs are assisted by local clergy who form the Joint Campus Ministry.

The Office of Student Organizations on the second floor of the Ley Student Center houses mailboxes for all student organizations. There is a student organization work space in the basement of the Rice Memorial Center that has office space, storage, and computers for student organization use.

## COMMUNITY INVOLVEMENT CENTER/RICE STUDENT VOLUNTEER PROGRAM

Housed in the cloisters of the Rice Memorial Center, the Community Involvement Center works to develop a culture of service within the university by functioning as an advocate for community service, social responsibility, and an increased awareness of social and community issues. The center acts as a clearinghouse for resources and referrals involving local, national, and international community agencies and service opportunities. By making educational programs and information available, the center fosters a lifelong commitment to service among students, faculty, and staff. It also organizes alternative semester break service trips, volunteer fairs, beach cleanups, and other activities. The 10 student service organizations supported by the Community Involvement Center

include Rice Habitat for Humanity, youth mentoring and tutoring programs, tutoring in English as a second language, Best Buddies, and the Rice Student Volunteer Program.

By heightening student awareness of community needs and generally raising social consciousness, the Rice Student Volunteer Program (RSVP) has organized volunteer projects for Rice students, faculty, and staff since 1985. The largest event of each semester is Outreach Day, a Saturday when approximately 500 students volunteer with more than 30 nonprofit agencies throughout the Houston area, learning how to take thoughtful action to build a stronger, more just community. With an office in the cloisters of the Rice Memorial Center, RSVP invites each student's involvement as an officer, a college representative, a committee member, a project organizer, or an interested participant in any RSVP event.

### **INTERCOLLEGIATE SPEECH AND DEBATE**

Consistently ranked in the top 10 nationally, the George R. Brown Forensic Society sponsors competition in the categories of Individual Events, Lincoln-Douglas, and Parliamentary Debate. The society provides students with the chance to hone their public speaking skills and to qualify for competition both at the American Forensic Association National Individual Events Tournament and at the National Parliamentary Debate Championships. Recognizing the importance of developing strong communication skills, the society has an open admissions policy, inviting students with little or no previous experience as well as those with extensive high school backgrounds to become members of one of the most successful teams at Rice. For more information on speech and debate, please go to [www.ruf.rice.edu/~forensic/eventinfo/](http://www.ruf.rice.edu/~forensic/eventinfo/).



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Information for

Chapter 17 - Statistics

## INTRODUCTION

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Since Rice opened in 1912, the university has recognized the importance of graduate study and research as a principal means of advancing knowledge. The first doctor of philosophy degree was awarded in 1918 in mathematics. Since that time, the graduate area has expanded to encompass the schools of architecture, engineering, humanities, management, music, natural sciences, and social sciences, as well as interdepartmental areas. The graduate program has steadily increased over time; Rice now enrolls approximately 1,900 graduate students and offers advanced degrees in 30 fields of study.

Graduate programs lead to either research or professional degrees. Research programs generally require the completion of a publishable thesis that represents an original and significant contribution to the particular field of study. Research degrees include the doctor of philosophy (PhD), doctor of architecture (DArch), master of arts (MA), and master of science (MS).

Professional programs provide advanced course work in several disciplines but do not generally include independent research. These programs lead to degrees in most of the major schools, including many engineering disciplines. (See the Graduate Degree Chart and the Interdepartmental and Cooperative Programs Chart on pages 59–63 for a complete listing of degrees offered.)

All degrees conferred by the university are awarded solely in recognition of educational attainments and not as warranty of future employment or admission to other programs of higher education.

For additional information on graduate programs and requirements, please go to [rgs.rice.edu](http://rgs.rice.edu).

## ADMISSION TO GRADUATE STUDY

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Graduate study is open to a limited number of extremely well-qualified students with a substantial background in their proposed field of study (this usually, though not always, means an undergraduate major in the field). Each department determines whether applicants have enough preparation to enter a given program, emphasizing the quality of their preparation rather than the particular academic program they completed or the credits they earned.

Admittance to a Rice University graduate-degree program, with the exception of those in the School of Music, requires a baccalaureate degree or its equivalent as determined by the Office of Graduate and Postdoctoral Studies. For the Shepherd School of Music, the equivalent to the baccalaureate degree will be determined by its graduate committee.

Applicants for admission to graduate study should either contact the appropriate department for application forms and relevant information about the program or visit the department's website for online application information. The Graduate Studies website, [rgs.rice.edu](http://rgs.rice.edu), also has links to the graduate departments' websites. The Graduate Degree and Department Information Chart (pages 59–62) lists department chairs with department phone/fax numbers and email addresses. Applicants should send all application materials, including transcripts and test scores, to the admitting department.

**Application Process**—An application for graduate study should include the completed application form, the application fee, transcript(s), recommendations, and writing samples, if required. Some departments require scores on the aptitude portion of the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT) and an appropriate advanced test. The ETS school code for Rice is 6609; in addition, applicants should send their test scores directly to the admitting department. See individual departmental listings for specific requirement information.

To make sure scores are available when admission decisions normally are made, applicants should take the GRE by the December before the fall for which they are applying. The application deadline for the fall semester is February 1. Some departments, however, may specify an earlier deadline, and departments may occasionally consider late applications.

Admission depends on students' previous academic records, available test scores, and letters of reference from scholars under whom they have studied. Writing samples, portfolios, or statements of purpose also may be required. In general, applicants should have at least a 3.00 (B) grade point average in undergraduate work. Applicants whose native language is not English must take the TOEFL test and should score at least 90 on the iBT TOEFL, at least 600 on the paper-based TOEFL, or at least 250 on the computer-based TOEFL. For those students who choose to take the IELTS in lieu of TOEFL, the minimum score is 7. The TOEFL school code for Rice is 6609. The TOEFL and IELTS may be waived for an international student who has received a degree from a university in which English is the official language of communication. Departments must send a justification letter for waiving the TOEFL test requirement to the Office of International Students and Scholars.

## GRADUATE DEGREES

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### RESEARCH DEGREES

Research degrees are offered in 6 of the 8 schools at Rice (the School of Management offers professional degrees only), with some degrees combining studies in more than 1 school. For general information on advanced degree work at Rice, see Requirements for Graduate Study (pages 64–65). Specific requirements for advanced research degrees in each field of study appear in the appropriate departmental pages (pages 78–276). Students seeking additional material should contact the appropriate department (see Graduate Degree and Department Information Chart on pages 59–62).

**PhD Programs**—The PhD degree is awarded for original studies in the departments listed in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (page 63); in architecture, the equivalent degree is the DArch. Candidates receive a PhD degree after successfully completing at least 90 semester hours of advanced study and concluding an original investigation that is formalized in an approved thesis. As final evidence of preparation for this degree, the candidate must pass a public oral examination. (See also Candidacy, Oral Examinations, and the Thesis Regulations on pages 65–67.) The residency requirement for the doctorate is 4 semesters of full-time study at the university.

**Master's Programs**—The MA degree is available in the departments listed in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (page 63), including certain scientific fields of study. The MS degree is offered in the engineering and science fields also listed in the chart. Candidates may undertake the MArch, MArch in Urban Design, and MMus degrees as research degrees by adopting the thesis option. Candidates receive a master's degree after completing at least 30 semester hours of study (including thesis hours), 24 hours of which must be taken at Rice. Master's programs require original work reported in a thesis and a public oral examination. Most students take 3 or 4 semesters to complete a master's degree (some programs may require more time). Students receiving a master's degree must be enrolled in a graduate program at Rice University for at least 1 semester of full-time study.

Students also may pursue a nonthesis degree in certain departments. This degree would be based on alternative departmental requirements and would include, but not be limited to, the following:

- 30 semester hours of study
- 24 semester hours must be at Rice University
- Minimum residency is one semester of full-time graduate study
- At least 15 hours of course work must be at or above the 500 level
- All courses must be in the relevant field

In certain departments, students may receive a master's degree (called an *Automatic Master's*) when they achieve candidacy for the doctoral degree. Students seeking a master's degree in this manner must submit a petition for the degree, signed by their department chair, to the Office of Graduate and Postdoctoral Studies by February 1 of the year in which the degree is to be awarded. (See also Candidacy, Oral Examinations, and the Thesis on page 65–67.)

## PROFESSIONAL DEGREES

Rice University offers advanced degree programs to prepare students for positions in a number of professional fields. The professional degrees offered appear in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (pages 59–63). In some departments, the professional degree also prepares the student for a doctoral-level program. All professional degrees are master's degrees with one exception: candidates earn the DMA after concluding a program of advanced music study.

Requirements for professional degrees include the successful completion of 30 semester hours or more of upper-level courses (at the 300 level or higher) with at least 24 hours taken at Rice. Minimum residency for all master's degrees is 1 semester of full-time study. Specific information and requirements for individual degrees appear in the Graduate Degree Chart (pages 59–62). Program information and application materials also are available from the departments (see Graduate Degree and Department Information Chart on pages 59–62). For general information on advanced degree work at Rice, see Requirements for Graduate Study (pages 64–65).

Rice undergraduate students who wish to enter a professional master's degree program should apply for admission through the normal procedures and in accordance with the normal timetables for application to such programs. While the GRE requirement may be waived in these cases, the authority for the waiver rests with the department. Departments may consider counting courses taken by the students while an undergraduate as credit toward the degree. The courses must be chosen from those that normally satisfy requirements toward the professional master's degree. No course can be used, however, simultaneously to satisfy an undergraduate and a graduate degree requirement. The department has authority to accept or reject a particular course for graduate credit. When an offer of admission is made, the department's offer letter should indicate that graduate financial aid and tuition waivers are not available to professional master's students. In addition, the department also must include in the offer letter a list of those courses taken by the student as an undergraduate that the department will accept for graduate course credit.

Admission into a professional program is granted separately from admission into a research or thesis program. Students who wish to change from a thesis program to a professional degree program must petition their department in writing. Upon recommendation of the department and approval by the dean's office, the request is sent to the Office of Graduate and Postdoctoral Studies for consideration and final approval. If approved, students who received tuition waivers while enrolled in the thesis program will be expected to repay the tuition before their professional degrees are awarded. Professional degree programs terminate when the degree is awarded. Students who wish to continue graduate study after completing a professional program must reapply for admission into a research program.



## GRADUATE DEGREE AND DEPARTMENT INFORMATION CHART

School Department and Department Chair	Graduate Degree Offered and Contact Information	Additional Options or Areas of Concentration (within majors)
<b>SCHOOL OF ARCHITECTURE</b>		
Lars Lerup (Dean) John J. Casbarian (Associate Dean)	MArch, MArch in Urban Design, DArch 713-348-4044 fax: 713-348-5277 arch@rice.edu 713-348-5152 www.arch.rice.edu/flash/	Architecture design, urbanism, theory, and practice
<b>SUSANNE M. GLASSCOCK SCHOOL OF CONTINUING STUDIES</b>		
Mary McIntire (Dean) John W. Freeman (MLS Director) Rebecca Sharp (Coordinator)	Master of Liberal Studies 713-348-4767 fax: 713-348-5213 mls@rice.edu www.mls.rice.edu	Humanities, science, and social sciences
<b>GEORGE R. BROWN SCHOOL OF ENGINEERING</b>		
Bioengineering  Rebecca Richards-Kortum	MBE, MS, PhD  713-348-5869 fax: 713-348-5877 bioeng@rice.edu bioe.rice.edu	Biomedical imaging and diagnostics, cellular and biomolecular engineering, computational and theoretical bioengineering, drug delivery and biomaterials, supramolecular biophysics and bioengineering, tissue engineering and biomechanics, and metabolic engineering.
Chemical and Biomolecular Engineering  Kyriacos Zygourakis	MChE, MS, PhD  713-348-4902 fax: 713-348-5478 www.ruf.rice.edu/~che/	Catalysis and nanotechnology, thermodynamics and phase equilibria, interfacial phenomena, colloids, microemulsions, rheology and fluid mechanics, biosystems engineering, biocatalysis and metabolic engineering, cell population heterogeneity and biological pattern formation, cellular and tissue engineering, energy and sustainability, gas hydrates, enhanced oil recovery, reservoir characterization, and pollution control
Civil and Environmental Engineering  Pedro Alvarez	MCE, MEE, MES MS, PhD  713-348-4949 fax: 713-348-5268 ceve@rice.edu www.ceve.rice.edu	Civil engineering: structural dynamics and control, structures and mechanics, reinforced and prestressed concrete, geotechnical engineering, computer-aided engineering, probability and random vibrations, reliability of systems, and solid mechanics  Environmental science: environmental biology, chemistry, toxicology, geology, and planning; surface and groundwater hydrology; water and wastewater treatment; and urban and regional air quality. Environmental engineering: hydrology and water resources engineering; water and wastewater treatment, design, and operation; and numerical modeling
Computational and Applied Mathematics  Danny C. Sorensen	MCAM, MCSE, MA, PhD  713-348-4805 fax: 713-348-5318 caam@rice.edu www.caam.rice.edu/	Numerical analysis, operations research, and differential equations; additional program in computational science and engineering (see Interdepartmental and Cooperative Programs)
Computer Science  Keith Cooper	MCS, MS, PhD  713-348-4834 fax: 713-348-5930 comp@rice.edu www.cs.rice.edu/	Algorithms and complexity, artificial intelligence and robotics, bioinformatics, compilers, distributed and parallel computation, graphics and visualization, operating systems, and programming languages

Electrical and Computer Engineering Behnaam Aazhang	MEE, MS, PhD 713-348-4020 fax: 713-348-5686 ece@rice.edu www.ece.rice.edu	Communication and signal processing, computer architecture and networking, electro-optics, and device physics
Mechanical Engineering and Materials Science  Enrique V. Barrera	MME, MMS, MS, PhD  713-348-4906 fax: 713-348-5423 mems@rice.edu www.mems.rice.edu/	Mechanical engineering: mechanics, computational mechanics, stochastic mechanics, fluid dynamics, heat transfer, dynamics and control, robotics, biomedical systems, and aerospace sciences. Materials science: nanotechnology, metals physics, statistical mechanics, metallic solid ther- modynamics, materials chemistry, aspects of composites, coatings and thin films, and interface science
Statistics  Katherine B. Ensor	MStat, MA, PhD  713-348-6032 fax: 713-348-5476 stat@rice.edu www.stat.rice.edu/	Applied probability, Bayesian methods, bioinformatics, biomathematics, biosta- tistics, data analysis, data mining, density estimation, epidemiology, environmental statistics, financial statistics, image pro- cessing, model building, nonparametric function estimation, quality control, risk management, spatial temporal statistics, statistical computing, statistical genetics, statistical visualization, stochastic processes, and time series analysis

**SCHOOL OF HUMANITIES**

English  Helena Michie	PhD  713-348-4840 fax: 713-348-5991 englgrad@rice.edu www.english.rice.edu	British and American literature and liter- ary theory
French Studies  Jean-Joseph Goux	MA, PhD  713-348-4851 fax: 713-348-5951 fren@rice.edu www.ruf.rice.edu/~fren/	French literature, language, and culture
Hispanic Studies  José Aranda	MA  713-348-5451 fax: 713-348-4863 span@rice.edu www.hispanicstudies.rice.edu	Spanish and Latin American literature and Spanish linguistics
History  Martin J. Wiener	MA, PhD  713-348-4948 fax: 713-348-5207 hist@rice.edu www.history.rice.edu/	U.S., European, and other history
Linguistics  Masayoshi Shibatani	MA, PhD  713-348-6010 fax: 713-348-4718 ling@ruf.rice.edu www.linguistics.rice.edu/	Anthropological, applied, cognitive, field, functional or discourse, and English, German, or Romance linguistics; second language ac- quisition; language typology and universals, sociolinguistic, phonetics, phonology, and speech technology
Philosophy  Steven Crowell	MA, PhD  713-348-4994 philos@rice.edu www.philosophy.rice.edu fax: 713-348-5847	Specialization in medical ethics, value theory, and history of philosophy

Religious Studies	PhD	African religions, African-American religion, The Bible and beyond, Jewish thought and philosophy, mysticism, Gnosticism, Ecotericism, modern Christianity in thought and popular culture, religion and psychology
Jeffrey Kripal	713-348-2238 fax: 713-348-5486 reli@rice.edu www.reli.rice.edu/	

**JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT**

William H. Glick (Dean)	MBA	Concentration options: accounting, energy, entrepreneurship, finance, global business, marketing, management consulting, and mastering creativity and innovation
Jeff Fleming (Associate Dean of Faculty Affairs)	MBA/Master of Engineering MBA/MD (with Baylor College of Medicine) MBA for Executives	
Sean Ferguson (Assistant Dean of Degree programs)	MBA for Professionals 713-348-5260 ricemba@rice.edu	
William Lee (Associate Dean of Executive Education)	www.jonesgsm.rice.edu/ Rice University Executive Education 713-348-6060 oed@rice.edu	
Rick Schell (Director)	Undergraduate business minor rice mba.rice.edu	

**SHEPHERD SCHOOL OF MUSIC**

Robert Yekovich (Dean)	BMus/MMus, MMus,  DMA	Composition, choral, and instrumental conducting, historical musicology, performance, and music theory  Composition and selected areas of performance
	713-348-4854 fax: 713-348-5317 musi@rice.edu www.ruf.rice.edu/~musi	

**WIESS SCHOOL OF NATURAL SCIENCES**

Biochemistry and Cell Biology	MA, PhD	Biochemistry, biophysics, developmental biology, cell biology, genetics, molecular biology, neurobiology, structure and function of nucleic acids and proteins, regulatory processes, biochemistry of lipids, enzymology, NMR and crystallography, cellular regulation, oxygen and electron transport, molecular genetics of plants, animals, fungi, bacteria, and bacteriophage
George Bennett	713-348-4015 fax: 713-348-5154 bioc@rice.edu biochem.rice.edu	
Chemistry	MA, PhD	Organic chemistry, inorganic chemistry, physical chemistry, nanotechnology, biological chemistry, theoretical and computational chemistry, materials chemistry, bio-organic chemistry, and bio-inorganic chemistry
Seiichi P. T. Matsuda	713-348-6158 fax: 713-348-5155 chem@rice.edu www.chem.rice.edu	
Earth Science	MA, PhD	Marine geology and geophysics; sedimentology, stratigraphy, paleoceanography, paleoclimatology, and evolution of continental margins and carbonate platforms; tectonics, neotectonics, tectonophysics, geodynamics, mantle processes, planetology, and space geodesy; remote sensing, potential fields, reflection and lithospheric seismology, global seismology, wave propagation and inverse theory; kinetics of fluid-solid interactions, low T aqueous geochemistry, petrology, and high T geochemistry, hydrogeology, sediment deformation, carbon cycling, and terrestrial-biosphere interactions
Alan Levander	713-348-4880 fax: 713-348-5214 geol@rice.edu www.earthscience.rice.edu/	

Ecology and Evolutionary Biology Joan Strassmann	MA, MS, PhD 713-348-4919 fax: 713-348-5232 eeb@rice.edu www.eeb.rice.edu	Ecology, plant and insect communities, populations, diversity, mutualisms, invasive species, evolution, quantitative genetics, mate choice, speciation, molecular evolution, adaptive evolution, behavioral ecology, sociobiology, genomics, and microbial evolution
Mathematics Michael Wolf	MA, PhD 713-348-4829 fax: 713-348-5231 math@rice.edu www.math.rice.edu	Differential and algebraic geometry, ergodic theory, partial differential equations, probability and combinatorics, real analysis, complex variables, geometric and algebraic topology, mathematical physics
Physics and Astronomy F. Barry Dunning	MST, MS, PhD 713-348-4938 fax: 713-348-4150 physics@rice.edu www.physics.rice.edu	Atomic, molecular, and optical physics; biophysics; nuclear and particle physics; condensed matter physics; nanoscale physics; surface physics; space plasma physics; solar physics; astronomy, high-energy astrophysics; and theoretical physics

### SCHOOL OF SOCIAL SCIENCES

Anthropology James D. Faubion	MA, PhD 713-348-4847 fax: 713-348-5455 anth@rice.edu www.ruf.rice.edu/~anth/	Archaeology, anthropological linguistics, social/cultural anthropology, theory, history, and global change
Economics Hervé Moulin	MA, PhD 713-348-2289 econ@rice.edu www.ruf.rice.edu/~econ/	Econometrics, economic theory, industrial organization and regulation, international trade and finance, labor, macroeconomics/monetary theory, and public finance and development
Political Science Rick K. Wilson	MA, PhD 713-348-4842 poli@rice.edu www.ruf.rice.edu/~poli/	American politics, comparative politics, and international relations
Psychology Stephan J. Motowidlo	MA, PhD 713-348-4856 fax: 713-348-5221 psyc@rice.edu www.ruf.rice.edu/~psyc/	Cognitive-experimental psychology and industrial-organizational/social psychology, with tracks in engineering psychology, human-computer interaction, and neuropsychology

### EDUCATION CERTIFICATION

Meredith Skura	MAT 713-348-4826 Fax: 713-348-5459 educ@rice.edu www.education.rice.edu/	Secondary education
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### INTERDEPARTMENTAL AND COOPERATIVE PROGRAMS

Opportunities for graduate study are available in a number of interdisciplinary areas. The advanced degree programs listed in the Interdepartmental and Cooperative Programs Chart (below) are administered by the participating Rice departments. They represent fields of study in rapidly developing areas of science and engineering or those areas subject to multiple investigations and interests. Rice also has established ties with other Houston universities and the Texas Medical Center to enable graduate students to receive training in computational biology research, to earn separate degrees simultaneously, or to focus their doctoral study on the specialized field of medical ethics.

## INTERDEPARTMENTAL AND COOPERATIVE PROGRAMS CHART

Program	Degrees Offered	Departments/Areas of Concentration
<b>INTERDEPARTMENTAL PROGRAMS</b>		
Applied Physics	Master's, PhD	Departments of physics and astronomy, chemistry, electrical and computer engineering, mechanical engineering and materials sciences, bioengineering, computational and applied mathematics, chemical and biomolecular engineering, and civil and environmental engineering; sciences that underlie important new and emerging technologies. Contact: Rice Quantum Institute, 713-348-6356 or ycreed@rice.edu
Computational Science and Engineering	MS, PhD	Modern computational techniques and use of powerful, new computers in research, development, and design involving the following departments: computational and applied mathematics, biochemistry and cell biology, earth sciences, computer science, chemical and biomolecular engineering, electrical and computer engineering, civil and environmental engineering, and statistics. Contact: 713-348-4657 or caam@caam.rice.edu
Education Certification	MAT	Secondary teaching certification in conjunction with BA in major field. Subjects include art, English, French, German, health science, history, Latin, life science, mathematics, physical education, physical science, physics/mathematics, science, social studies, and Spanish
Environmental Analysis and Decision Making	MS	Departments of computational and applied mathematics, statistics, civil and environmental engineering, chemistry, earth science, ecology and evolutionary biology, mechanical engineering and materials science, chemical and biomolecular engineering, sociology, electrical and computer engineering, management, and natural sciences. Contact Professional Master's Program: 713-348-3188 or profms@rice.edu
Master of Liberal Studies	MLS	Susanne M. Glasscock School of Continuing Studies/Humanities, Sciences, and Social Sciences. Contact: 713-348-4767 or mls@rice.edu
Materials Science and Engineering	MS, PhD	Departments of chemistry, electrical and computer engineering, mechanical engineering and materials science, chemical and biomolecular engineering, and physics and astronomy. Contact: 713-348-4906 or mems@rice.edu
Nanoscale Physics	MS	Departments of physics and astronomy, electrical and computer engineering, chemistry, management, and natural sciences. Contact Professional Master's Program: 713-348-3188 or profms@rice.edu
Study of Women, Gender, and Sexuality	Graduate Certificate	Departments in anthropology, English, French, history, linguistics, philosophy, psychology, and religious studies
Subsurface Geoscience	MS	Departments in earth science, chemistry, statistics, management, sociology, and natural sciences. Contact Professional Master's Program: 713-348-3188 or profms@rice.edu
<b>COOPERATIVE PROGRAMS</b>		
Joint Program in Computational Biology	Training opportunities for PhD students	Research in a lab setting, seminars, and workshops and access to advanced resources of W.M. Keck Center for Computational Biology (fellowships available); with Baylor College of Medicine and the University of Houston. Contact: 713-348-4752 or bioc@rice.edu
Joint Programs with Medical Colleges	MD/PhD, MD/MA, MD/MS	Combined MD and advanced research degree for research careers in medicine; with Baylor College of Medicine. Contact: 713-348-5869 or bioeng@rice.edu

# ACADEMIC REGULATIONS

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## FINAL EXAMINATION IN GRADUATE COURSES

Graduate courses, especially those with significant undergraduate student enrollment, should follow the guidelines for undergraduate courses (pages 28–29) regarding scheduling of projects, papers, and finals during the last weeks of classes, reading periods, and final exam periods. However, instructors have the discretion to modify those guidelines as appropriate for their specific courses. Such modifications and the final schedule must be made clear at the beginning of the semester.

## REQUIREMENTS FOR GRADUATE STUDY

Graduate students must meet the following minimums, deadlines, and course or grade requirements to graduate in good standing from the university. Some departments may have stricter policies and/or requirements.

**Residency**—Master's students must complete at least 1 full fall and/or spring semester in full-time study in a graduate program at Rice University. PhD students must complete at least 4 full fall and/or spring semesters in full-time study at Rice University.

**Full-time Study**—Semester course load for full-time students is 9 hours or more as required by specific departments. Graduate programs at Rice generally require full-time study. Students wishing to enroll for less than full time or wishing to drop below full time during the semester must receive written permission from their academic department, and that written approval must be forwarded to the Office of Graduate and Postdoctoral Studies.

**Part-time Study**—Admission of part-time students requires departmental permission, and students must register for at least 3 hours in a semester. All time-to-degree requirements apply to part-time students.

**Time to Degree**—PhD students are required to complete their program, including thesis defense, within 10 years of initial enrollment in the degree program. All masters students are required to complete their program, including thesis defense, within 5 years of initial enrollment. In both cases, students have a limit of 6 additional months from the date of defense to submit their theses to the Office of Graduate and Postdoctoral Studies. These time boundaries include any period in which the student was not enrolled or enrolled part time, for whatever reason. Failure to meet any university time to degree deadline may result in the student not being able to continue in their degree program.

**Time to Candidacy**—PhD students must be approved for candidacy before the beginning of the 9th semester of their residency at Rice. Masters students must be approved for candidacy before the beginning of the 5th semester of their residency at Rice.

**Time to Defense**—PhD students must defend their theses before the end of the 16th semester of their residency at Rice. Masters students must defend their theses before the end of the 8th semester of their residency at Rice.

**Time to Thesis Submission**—After candidates successfully pass the oral examination in defense of the thesis, they must submit 2 signed copies of the thesis to the Office of Graduate and Postdoctoral Studies no later than 6 months from the date of the examination.

**Minimum Hours**—Students must register for at least 3 hours in a semester.

**Course Registration**—Students may register for courses of study and drop or add courses only with the approval of their advisor or the department chair.

**Deadlines**—Students must observe all deadlines listed in the Academic Calendar (pages vii–xiii).

**Grades**—To graduate, students must achieve at least a B- (2.67) grade point average in courses counted toward the graduate degree. Some programs and departments have more stringent standards. To compute grade point averages, the credits attempted in semester hours for each course and the points for the grade earned (from A+ = 4.33 to F = 0.00) are multiplied, then the products (1 for each course) are added together, and the sum is divided by the total credits attempted. See also Probationary Status (page 69).

**Pass/Fail**—All students, except Class III students, may take course(s) Pass/Fail outside their department. They must file a course as Pass/Fail no later than the end of the 10th week of classes; however, they may later convert a Pass/Fail to a graded course by filing the appropriate paperwork with the registrar. Students should be aware that while a grade of P does not affect their Grade Point Average, a grade of F does.

**Satisfactory/Unsatisfactory**—Some departments may assign a grade of S or U. Students should be aware that while a grade of S or U does not affect their Grade Point Average, no credit will be awarded if a grade of U is received. Courses with a grade of S will count towards total credits earned. Class III students cannot take courses on a satisfactory/unsatisfactory grading basis.

**Departmental Duties**—In most research degree programs, students must undertake a limited amount of teaching or perform other services as part of their training. Assigned duties should not entail more than 10 hours per week, averaged over the semester, or extend over more than 8 semesters.

**Research and Scholarly Activities**—Research and other scholarly activities of all students must be compliant with Rice University policies. It is recommended that students familiarize themselves with these policies before embarking on research or other scholarly activities. Particularly pertinent to students are policy 324–00 (Research Misconduct), policy 326–98 (Human Health and Safety in the Performance of Research), policy 333 (Patent and Software Policies), and policy 334 (Copyright Policy).

**Employment**—Students receiving a stipend may accept employment only with the approval of their home academic department. Students working for more than 20 hours per week are not normally eligible for full-time status.

**Continuous Enrollment**—Students must maintain continuous program involvement and enrollment unless granted an official leave of absence. See Leaves or Withdrawals (page 68) for more information.

## CANDIDACY, ORAL EXAMINATIONS, AND THE THESIS

**Approval of Candidacy**—Candidacy marks a midpoint in the course of graduate education. Achieving candidacy for the PhD implies that a graduate student has: (a) completed required course work, (b) passed required exams to demonstrate his/her comprehensive grasp of the subject area, (c) demonstrated the ability for clear oral and written communication, and (d) shown the ability to carry on scholarly work in his/her subject area. Requirements for achieving candidacy for the thesis master's degree are determined at the departmental level. Students enrolled in research degree programs submit their petitions for candidacy for a master's or doctoral degree through the department chair

to the vice provost for research and graduate studies. In the petition sent to the vice provost, the department chair identifies the student's thesis director, recommends a thesis committee, certifies that the applicant has fulfilled the departmental requirements, and provides a course transcript as evidence that work completed within the department is of high quality.

Students must file their applications for approval of PhD and MA/MS candidacy in the Office of Graduate and Postdoctoral Studies on or before November 1 for midyear conferral and on or before February 1 for May commencement. Students may take the final oral examination in defense of their thesis only after the vice provost for research and graduate studies approves their candidacy. PhD students must be approved for candidacy before the beginning of the ninth semester of their residency at Rice. Master's students must be approved for candidacy before the beginning of the fifth semester of their residency at Rice.

**Thesis Committee**—The thesis committee administers the oral examination for the student's thesis defense and has final approval/disapproval authority and responsibility for the written thesis.

A thesis committee is composed of at least three members. Two, including the committee chair, must be members of the student's department faculty; in doctoral thesis committees 1 member must have his or her primary appointment in another department within the university. At least 3 members of the committee must meet 1 of the following requirements:

- Tenured or tenure-track members of the Rice faculty
- Research faculty holding the rank of faculty fellow, senior faculty fellow, or distinguished faculty fellow
- Faculty who have been certified as thesis committee members by the vice provost for research and graduate studies

The composition of the thesis committee must always meet the guidelines mentioned above.

The committee chair need not be the thesis director. The chair, however, must be either a tenured or tenure-track member of the major department or a research faculty member of the major department. Additional members of the committee, who may or may not meet the above criteria, may be selected with the approval of the department chair. These would be in addition to the three required members.

Candidates are responsible for keeping the members of their committee informed about the nature and progress of their research. They also must establish a schedule for thesis completion and review. The members of the committee, in turn, should review the thesis in a timely manner, approving a preliminary form of the thesis before scheduling the oral examination.

**Announcement of Thesis Defense**—Oral examinations for the doctoral degree must be announced at least 2 weeks in advance. Oral examination announcements are to be submitted to the Office of Graduate and Postdoctoral Studies by entering the information into the Graduate Students Thesis Defense Announcement form at [events.rice.edu/rgs/index.cfm](http://events.rice.edu/rgs/index.cfm). An automatically generated email will be sent to the Office of Research and Graduate Studies once the defense form has been submitted.

Oral examinations for the master's degree require only that public notice of the oral defense be posted on the department bulletin board 1 week in advance and a copy be sent to the Office of Graduate and Postdoctoral Studies.



**Oral Examination in Defense of Thesis**—The public oral defense of a thesis is intended to be an examination of a completed body of work and should be scheduled only when the dissertation is essentially completed. At least 1 copy of the thesis must be available in the departmental office not less than 2 calendar weeks prior to the date of the oral defense. The length of the oral examination and the subject matter on which the candidate is questioned are left to the judgment of the committee. The defense should be scheduled by the student after consultation with the thesis advisor, who agrees that the thesis is completed and ready to be defended. All members of the thesis committee must be present for the oral defense. A candidate must be enrolled in the semester in which his or her oral examination is held. Students who defend during the summer must enroll in the summer session of classes. For the purpose of the oral defense only, enrollment in a semester is considered valid through the Friday of the first week of class of the following semester. Students passing the oral examination on or before the end of the 1st week of classes of any semester do not have to register for that or any subsequent semester even though they may be continuing to make minor revisions to the final copy of their thesis.

Should a candidate fail, the committee chair may schedule a 2nd examination. Students who fail a second time must withdraw from the university.

Students must send a copy of their approval of candidacy form, signed by the thesis committee signifying successful defense of the thesis, to the Office of Graduate and Postdoctoral Studies within 1 week after the oral examination. The original approval of candidacy form must be turned in when the thesis is submitted.

No later than 6 months from the date of the examination, candidates who successfully passed the oral examination in defense of the thesis must submit 2 signed copies of the thesis to the Office of Graduate and Postdoctoral Studies. If the thesis is not ready for final signature by the end of the 6-month period, the “pass” will be revoked and an additional oral defense will need to be scheduled. Extensions of this 6-month period for completion without reexamination will be granted only in rare circumstances. Applications for an extension must be made by the candidate with the unanimous support of the thesis committee and approved by the Office of Graduate and Postdoctoral Studies.

PhD students must defend their theses before the end of the 16th semester of their residency at Rice. Master’s students must defend their theses before the end of the 8th semester of their residency at Rice.

**Thesis Regulations and Procedures**—The thesis is the principal record of a student’s work for an advanced degree. It is permanently preserved in the library. Instructions for thesis submission and guidelines for thesis formatting are provided by the Office of Graduate and Postdoctoral Studies at the time of approval of candidacy. Additional copies of these instructions are available from the graduate studies office and can also be accessed on the Rice website at: [rgs.rice.edu/grad/policies/thesis](http://rgs.rice.edu/grad/policies/thesis).

Students must have the original signatures of their thesis committee on two title pages of their dissertation. Students submitting a dissertation for the PhD, DArch, or DMA must fill out a Survey of Earned Doctorates form. All students submitting theses, whether for master’s or doctoral degrees, must complete a University Microfilm contract. Students must pay their fees for microfilming and binding their theses to the cashier before submitting the 2 copies to the Office of Graduate and Postdoctoral Studies for approval. The thesis may be

submitted to the Office of Graduate and Postdoctoral Studies at any time; however students must meet the deadline for the thesis submission listed in the Academic Calendar (pages vii–xiii).

## LEAVES OR WITHDRAWALS

**Leave of Absence**—A leave of absence is granted only by the Office of Graduate and Postdoctoral Studies on the recommendation of the department chair and only to graduate students in good standing with the university. Students must obtain approval for a leave before the academic semester in question. These requests, approved by the department, must be received in the Office of Research and Graduate Studies prior to the 1st day of classes.

Leaves are not granted after students register for courses or after the registration period passes. Normally, students may take a leave of absence for no more than 2 consecutive semesters. The semesters that a student is on leave do not count against the time to candidacy or the time to defense. It does, however, count against the time to degree. Students must pay a reinstatement fee of \$100 on their return from an official leave.

**Short-Term Medical and Parental Leave**—If a graduate student cannot fulfill the duties of his or her appointment due to a medical emergency or the adoption or birth of a child, enrollment and stipend support may be continued for up to 6 weeks or until the appointment expires (whichever occurs first). Complete guidelines for obtaining a short term or parental leave are available at: [rgs.rice.edu/Grad/Policies/med-mat-leave.cfm](http://rgs.rice.edu/Grad/Policies/med-mat-leave.cfm).

**Withdrawal and Readmission**—Students who wish to withdraw from Rice during the semester, for any reason, are to notify the chair of their academic department in writing (see Refund of Tuition and Fees, pages 44–45). Failure to register for any period without a leave of absence granted by the Office of Graduate and Postdoctoral Studies constitutes a de facto withdrawal.

The university may insist on a student's involuntary withdrawal if, in the judgement of the vice provost for research and graduate studies, the student

- Poses a threat to the lives or safety of him/herself or other members of the Rice community
- Has a medical or psychological problem that cannot be properly treated in the university setting
- Has a medical condition or demonstrates behavior that seriously interferes with the education of other members of the Rice community

Students who later wish to resume study, whether after voluntary or involuntary withdrawal, must reapply to the university. Readmission requires the recommendation of the department chair and the approval of the vice provost for research and graduate studies. Accepted students must pay a readmission fee of \$300.

Students who withdraw for medical reasons must meet certain conditions when applying for readmission. They must submit a written petition for readmission to the Office of Graduate and Postdoctoral Studies at least 1 month before the start of the semester in which they wish to resume their work at Rice. They also must provide evidence from a health professional that they have resolved the problems leading to their withdrawal. Some cases may require an interview with the director of the Rice Counseling Center, the director of Student Health Services, or their designees.

**Nonenrollment**—Students may not do degree work at Rice or work involving Rice faculty or facilities during any period of nonenrollment, except during the period following successful oral defense prior to submission of the final thesis.

## DROP/ADD

During the first 2 weeks of classes, all students may change their registration without a penalty fee by adding or dropping courses with the appropriate advisor's approval. Students must obtain the instructor's permission and the advisor's approval to add a course after the 2nd week of classes. Students may not add courses after the 4th week of classes without the permission of the Office of Graduate and Postdoctoral Studies.

Students may not drop courses after the end of the 10th week of classes, except by approval of the Office of Graduate and Postdoctoral Studies (a \$50 fee is assessed for courses dropped after the 10th week by non-1st-semester students). The student's request to drop a course must be approved by the student's advisor and then forwarded to the vice provost for consideration.

Students who add or drop courses after the 2nd week but before the deadlines noted above are charged for each drop/add form submitted according to the fee schedule (see page 22).

## ACADEMIC DISCIPLINE

**Probationary Status**—Students whose cumulative grade point average or the average for the most recently completed semester (including the summer semester) falls below 2.33 are placed on probationary status; some departments may have more stringent standards. Although the department in most cases sends the student a letter of warning, probationary status applies whether or not a letter has been issued. A second semester of probationary status leads to automatic dismissal by the Office of Graduate and Postdoctoral Studies unless the student's department presents a plea for exception that is approved by the vice provost for research and graduate studies. Departments are free to dismiss a student in the 1st semester of probationary status if they issue a warning before taking action.

**Dismissal**—Reasons for student dismissal include unsatisfactory progress as determined by the student's department or behavior judged by Rice to be disruptive or otherwise contrary to the best interests of either the university or the student.

## APPEAL

Students may petition the Office of Graduate and Postdoctoral Studies regarding the application of any academic regulation. Petitions should go through department chairs and divisional deans, who will be asked to comment on their merits. In some cases, the vice provost will seek the advice of the Graduate Council. For appeals regarding nonacademic matters, see the following section on problem resolution.

## OTHER DISCIPLINARY SANCTIONS

Additionally, the assistant dean of student judicial programs may place students on probation or suspension for violating the Honor Code or Code of Student Conduct or for other disciplinary reasons. Students on disciplinary suspension (including for an Honor Code violation) may not receive their degree even if they have met all academic requirements for graduation. They must leave the university within 48 hours of being informed of the dean's decision, though in cases of unusual hardship, the assistant dean of student judicial programs may extend the deadline to one week. Any tuition refund will be prorated from the official date of suspension, which is determined by the registrar. While on disciplinary suspension, students may not run for, or hold, any elective or appointed office in any official Rice organization. Participation in student

activities on and off campus and use of Rice facilities are limited to enrolled students. Students seeking admission after leaving the university because of a sanction imposed by the assistant dean should submit a petition in writing for review by the assistant dean.

### PROCEDURES FOR RESOLUTION OF PROBLEMS

Problems or conflicts may arise during a student's graduate education. Students should take responsibility for informing the appropriate faculty of any such problem. All parties involved should work together amicably with the goal of resolving the problem informally if at all possible. When attempts to resolve a problem informally do not meet with success, the following grievance procedure should be adopted.

1. The student should submit the grievance in writing to the departmental chair, who will then attempt to resolve the problem.
2. If the student remains unsatisfied, the problem should be presented to a departmental committee for resolution. This committee should be a standing committee and not the student's own review or dissertation committee. Both the student and the chair should submit a written record of their views to this committee.
3. If the student remains unsatisfied, the problem should be referred to a standing subcommittee designed at Graduate Council and composed of 3 faculty members (representing diverse disciplines within the university), 1 graduate student, and the associate dean for graduate studies. A written report of proceedings at stage 2 should be presented to the chair of graduate council for forwarding to the subcommittee, along with all other written materials generated during the investigation. The decision of this subcommittee will be considered final.

## TUITION, FEES, AND EXPENSES

The tuition and fees for graduate students in this section are for the 2007-08 academic year only and are subject to change in subsequent years. Current tuition and fees for all graduate students, full time and part time:

	Annual	Semester	Hour
<b>Tuition</b>			
Entering Students	\$28,400	\$14,200	\$1,578
Continuing Students	28,400	14,200	1,578
Architecture, Music, Professional Masters	\$24,330	\$ 12,165	\$1,352
Professional Masters in Natural Sciences Entering Fall 2006	23,400	11,700	1,300
Required Fees*	564	282	
Jones School MBA			
Entering Fall '06	33,500	16,750	1,862
Entering Fall '07	33,500	16,750	1,862
Required Fees**	2,234	1,117	
Jones School MBA for Executives			
Entering Fall '06 (2-year rate)	81,450		
Entering Fall '07 (2-year rate)	84,000		
Jones School MBA for Professionals			
Entering Fall '06 (2-year rate)	74,000		
Entering Fall '07 (2-year rate)	79,000		

Master of Liberal Studies	
Cost Per Course	2,246
Required Fees Per Session***	48

**Fees**

*Graduates	Annual	Semester
Graduate Student Association	20	10
Student Organization Fund	8	4
Honor Council	2	1
Health Services	414	207
Information Technology	120	60
	<u>564</u>	<u>282</u>
**Jones School MBA		
Graduate Student Association	20	10
Student Organization Fund	8	4
Honor Council	2	1
Health Services	414	207
Information Technology	120	60
Jones School Association	70	35
Jones School Material	1,600	800
	<u>2,234</u>	<u>1,117</u>
***Master of Liberal Studies		
GSA Fees Per Session (annual max \$20)	10	
Activity Fee Per Session	38	
	48	

**Away Status**—Graduate students pursuing their studies outside of the Houston area (graduate students on “away” status) must be registered and pay tuition but are not required to pay the fees listed above, with the exception of the Information Technology Fee (\$60/semester).

**Reduced Tuition**—After 6 semesters of full-time study in 1 degree program (excluding the summer semesters), continuing students enter a reduced-tuition rate. A semester of full-time study is defined as a fall or spring semester in which at least 9 hours of credit are earned. The reduced rate varies by department. For continuing graduates, the rate is \$1,578 per year (\$789 per semester). For architecture, Shepherd School, and professional masters in natural sciences and engineering, the rate is \$1,352 per year (\$676 per semester). For professional masters in natural sciences prior to fall 2007, the rate is \$1,300 per year (\$650 per semester). Students who are admitted with a relevant master’s degree, i.e., a master’s degree that counts toward a doctoral program at Rice, may become eligible for reduced tuition earlier than those entering a doctoral program without a relevant master’s degree. Semesters credited toward reduced tuition will be limited to 1 degree program. In extraordinary circumstances, the Office of Graduate and Postdoctoral Studies may consider petitions for exceptions.

**Health Insurance**—All students, full time or part time—including those on away status—must carry health insurance (see page 11).

**Other Fees**—Unless students elect a special payment plan, they must pay all tuition and fees for the fall semester by the middle of August and for the spring semester by the end of the 1st week of January. Past these deadlines, a late payment penalty of \$140 will be assessed.

Other fees applicable under special circumstances:

Preceptorship (per semester) . . . . .	\$230
Internship (per semester) . . . . .	230
Study abroad fee—per semester . . . . .	250

Graduate application fee . . . . .	40
Jones School application fee: MBA . . . . .	100
Jones School application fee: EMBA . . . . .	100
Part-time registration fee . . . . .	125
Late registration fee 1 . . . . .	70
Late registration fee 2 . . . . .	120
Late course change fee	
Adds:	
Week 1-2 . . . . .	Free
Week 3-4 . . . . .	10
Week 5 and after . . . . .	50
Drops:	
Weeks 1-4 . . . . .	Free
Weeks 5-10 . . . . .	10
Week 11 and after . . . . .	50
Deferred Payment Plan late fee . . . . .	35
Diploma fee: sheepskin . . . . .	115
Diploma fee: parchment . . . . .	40
Diploma fee: facsimile . . . . .	15
Diploma mailing fee: domestic . . . . .	30
Diploma mailing fee: air mail . . . . .	35
Transcript fee . . . . .	5
Class III registration fee . . . . .	125
Class III late application fee . . . . .	90
Class III late registration fee . . . . .	120
Intramural fee . . . . .	20
Readmission fee: graduate students only . . . . .	300
Reinstatement fee: graduate students only . . . . .	100
Replacement ID . . . . .	10

*For more information, see Refund of Tuition and Fees (pages 45).*

## FINANCIAL AID

### FELLOWSHIPS, SCHOLARSHIPS, AND ASSISTANTSHIPS

A range of fellowships, scholarships, and assistantships are available at Rice. Most graduate students in degree programs requiring a thesis are supported by fellowships or research assistantships.

**Rice Graduate Fellowships**—Doctoral students with high academic records and strong qualifications receive support through Rice fellowships. In most cases, these fellowships provide a stipend plus tuition for the 9-month academic period. Departments may nominate particularly outstanding entering students for a Rice Presidential Fellowship.

**Rice Graduate Tuition Scholarships**—Students whose previous records show marked promise but for whom no graduate fellowships are available may receive full or partial graduate tuition scholarships, which do not include a stipend.

**Research and Teaching Assistantships**—Usually funded from grants and contracts, research assistantships are available in many departments. Qualified students (usually 2nd-year or later) receive these awards to provide assistance on faculty research projects, work that usually contributes to the student's own thesis. In some departments, a limited number of teaching assistantships may be available to advanced students.

Fellowship, scholarship, and assistantship recipients are selected by the individual departments, subject to the approval of the Office of Graduate and Postdoctoral Studies. Students should send their applications for such awards directly to the department involved.

To receive Rice fellowships, graduate tuition scholarships, or assistantship aid, students must be engaged in full-time graduate study; part-time students and students who are not enrolled are not eligible for such aid.

Students receiving stipends from fellowships or assistantships may not accept any regular paid employment on or off campus without the explicit permission of the department. Full-time students, whether receiving stipend support or not, may not accept paid employment in excess of 20 hours per week.

## LOANS AND WORK-STUDY FINANCIAL AID

In addition to fellowships, scholarships, and assistantships, the Office of Student Financial Services offers assistance in the form of loans. Interested students must file a Free Application for Federal Student Aid (FAFSA) and a Rice Graduate Financial Aid application or a Rice Jones School application and submit copies of income tax returns and W-2's. The priority deadline to apply is April 15. (Loan assistance through Rice is not available to Master of Liberal Studies students.)

To be eligible to apply for loans and federal work-study employment, graduate students must maintain satisfactory academic progress as defined by their departments. Should a graduate student fail to make satisfactory academic progress, the student's aid eligibility will be terminated. Graduate students who enroll for less than 5 hours in a term will not be eligible for financial aid.

**Federal Student Loans**—These are low-interest loans made to students attending the university at least half time. Subsidized Stafford loans require need-based financial aid eligibility, but unsubsidized Stafford loans and PLUS loans are available to all students. Stafford loan eligibility is subject to annual and lifetime borrowing limits.

**Loan Counseling**—Students who are recipients of federal student loans will be required to complete online loan entrance counseling before funds will be credited to student accounts. Students also will be required to complete online exit counseling at the completion of a program of study at Rice. Failure to complete online exit counseling will result in a transcript hold.

**Private Loan Programs**—Private loans are available to graduate and MBA students. These loans are not based on need but do require credit approval from the lender and cannot exceed the student's cost of education, as determined by Rice, minus other resources.

**Special Loan Programs**—A Gulf Oil Corporation Foundation Loan Fund and the Benjamin S. Lindsey and Veola Noble Lindsey Memorial Loan Fund are available to help students working toward a degree meet their educational expenses, but funds are limited. Interested students may contact the Office of Student Financial Services.

**The Mary Lyn and Niles Moseley Loan Fund and the Professor John A. S. Adams, Sr., Memorial Graduate Student Loan Fund**—These funds provide financial assistance, in the form of loans, to graduate students at Rice University. Students wishing to apply for such a loan should obtain an application from the Office of Student Financial Services. Guidelines for the program are:

- Individual loans are made for an amount not to exceed \$2,000.
- Loans are made for a period of up to one year and, upon request, may be renewable annually.

- The interest rate applicable to these loans is determined by the university.
- Graduate students must be enrolled on a full-time basis to be eligible to apply for a loan and must maintain full enrollment during the full term of the loan.
- Upon completion, applications are submitted to the vice provost for research and graduate studies for approval.
- Loans are available during the full course of the academic year.
- Loans must be repaid before graduation.

**Emergency Loan Fund**—Established through gifts from the Graduate Wives Club of 1972–73, the Graduate Student Association, and various faculty members, this fund makes available emergency loans to help graduate students at Rice with short-term needs. Loans are limited to \$250 and must be repaid within 3 months. In lieu of interest, a charge of \$5 per loan is assessed to maintain the fund.

**Summer Aid**—Graduate students are eligible to apply for private educational loans if they are registered during the summer term.

**Other Fellowships, Honors, and Prizes**—Provisions are made for a variety of fellowships, scholarships, and prizes available to graduates of this and other universities. Memorial fellowships that have been founded and endowed by gift or bequest on the part of friends of Rice University provide stipends enabling the holders to devote their time to study and research in their chosen fields. There also are several industrial fellowships maintained by companies interested in the development of technical fields and the training of competent scientists, engineers, and business executives.

Persons desiring consideration for appointment as fellows should consult with the department in which they wish to do research. However, not all fellowships are available every year.

**Return of Title IV Funds**—Students who receive federal funds as part of their aid packages and do not complete the academic term may be subject to returning a portion of those funds. Contact student Financial Services for information about policies and procedures regarding the return of Title IV funds.

## GRADUATE STUDENT LIFE

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### GRADUATE STUDENT ASSOCIATION

All full-time students in the graduate program are members of the Graduate Student Association, which is the sole organization representing graduate students as a body. The governing body of this organization is the Graduate Student Association Council, consisting of a representative from each department offering graduate study and a president, vice president, secretary, and treasurer elected by the council. Graduate students also participate in university affairs through their representatives on many standing and ad hoc university committees, such as the Graduate Council, the Research Council, and various department committees.

One of the functions of the Graduate Student Association is to encourage social interaction among graduate students from different departments. To that end, the association organizes a variety of social activities open to all members of the graduate student body.

### HOUSING FOR GRADUATE STUDENTS

Rice Graduate Apartments is a garden style complex nestled on 2.7 acres and located just north of campus. The community features include, quick and easy



access to campus, attractive landscaping, and good lighting in all common areas designed to enhance the security and aesthetics of pedestrian, bike, auto paths, parking, and recreational areas. Electronically controlled gates for pedestrian and vehicular paths are provided. Handicap-accessible units are available to students with disabilities. A shuttle bus travels back and forth between the apartments and campus.

There are 112 units, totaling 222 beds, in 1-bedroom, 2-bedroom, 4-bedroom, and efficiency apartment configurations. The complex is designed with a centrally located area for social activities, a laundry room on each floor, a study room, a computer lab, 2 enclosed bike rack rooms, two courtyards, and an onsite RUPD substation. Each apartment, except the efficiencies, offers a living room and fully equipped kitchen. All units are furnished with a full-size bed, desk, chair, dresser, nightstand, and two bar stools. In addition, each unit includes free basic cable TV, water, and a network drop for a personal computer. The apartment management team to assist the students includes community manager, assistant manager, coordinator, 4 resident assistants, lead maintenance, assistant maintenance, and housekeeping. Housing is assigned on a lottery system. Call 713-348-GRAD (4723) for further information.

The Morningside Square Apartments are 2-story 1950s vintage units located in a quiet neighborhood adjacent to Rice Village. The community is a short walking distance to the campus, restaurants, and shopping areas. The 23-unit community offers 1-bedroom, 2-bedroom, and 3-bedroom apartments. The common hallways, bedrooms, and living rooms feature oak hardwood flooring. Kitchens are equipped with a refrigerator and gas range. All units have ceiling fans, a gas furnace, and window air conditioners. Basic cable TV is provided, and a coin operated laundry is available on site. Apartments are assigned on a space available basis. Call 713-524-1275 for further information.

Information Desk, the Office of Student Activities, and the Graduate Student Association keep records of available rooms and apartments listed with the university by area landlords. The daily newspaper and a weekly *Greensheet* are other sources of rental housing information. Incoming graduate students should arrive in Houston several days early to allow themselves time to find suitable housing.

### **HEALTH INSURANCE REQUIREMENTS FOR GRADUATE STUDENTS**

Paying the student health service fee gives graduate students access to both the Student Health Service and the Rice Counseling Center (see pages 10–11). New graduate students may not register for or attend classes until they have completed and returned the health data form to Rice and have met the immunization and TB screening requirements.

All graduate students must have health insurance purchased through Rice or provided by an outside source. Students may purchase insurance through the university. Rice's group coverage for the 2006–07 academic year is effective from 12:01 AM, August 15, 2006, until 12:01 AM August 15, 2007. Dependent coverage also is available. A description of the policy and the application form can be found on the Web at [studenthealthinsurance.rice.edu](http://studenthealthinsurance.rice.edu). A waiver form, if outside insurance is provided, also can be found at this site. Students should submit either the application or waiver by August 15 each year.

### **CLASS III STUDENTS IN NONDEGREE PROGRAMS**

Students with a 3.00 (B) or better grade average and an undergraduate or graduate degree from an accredited college or university may apply for admission

as Class III students. These students may take courses for credit without being admitted to a specific degree program. Registration requires the permission of the instructor and approval by the vice provost for research and graduate studies. Class III students must register for at least 3 hours and cannot take courses on a pass/fail or satisfactory/unsatisfactory basis. Class III students must receive at least a B for all classes taken or they will not be allowed to remain in the Class III program.

Students may not use courses taken under this arrangement to fulfill the requirements for a Rice degree unless and until they have been accepted into a degree program by an academic department (as well as, in the case of graduate students, by the vice provost for research and graduate studies) and received department approval; students are responsible for obtaining the proper approvals. Students may request that the department allow up to 3 courses taken as Class III to count toward their graduate degree.

### **APPLICATIONS FOR CLASS III**

Applications and course request forms are available from the Office of Graduate and Postdoctoral Studies. Official transcripts from all colleges and universities the student has attended should be mailed directly by the institutions to the Office of Graduate and Postdoctoral Studies. Students who were previously Class III students must complete a new application (without transcripts) for each such semester. All application materials are due by the workday closest to August 1 for fall semester courses and December 1 for spring semester courses. Late applications are not considered after classes have begun. Individuals applying as Class III students for the summer term should apply to the Summer School for College Students (see pages 37).

### **TUITION AND FEES FOR CLASS III**

The tuition for 2007-08 is \$1,578 per semester hour, not to exceed \$14,200, plus a \$125 registration fee and a \$60 InfoTech fee each semester. All fees are payable prior to registration. Students failing to submit their applications by the deadline must pay a late application fee of \$90, and students registering after the 2nd week of class must pay a \$120 late registration fee and also may have to pay a late payment fee. For some courses, students may be charged for computer time. If a class fills with degree students, instructors may drop Class III students up to the end of the 3rd week of class. In that case, the tuition (less \$30 of the registration fee) will be refunded. Please see pages 37 for information pertaining to summer school.



**Department of  
Interdisciplinary Programs**

# AIR FORCE SCIENCE

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**COMMANDER AND PROFESSOR**

Colonel Phil Bossert

**ASSOCIATE PROFESSORS**

Captain Albert Chapman

Captain Brian K. Kusia

The Air Force Reserve Officer Training (ROTC) program prepares men and women of character, commitment, and courage to assume leadership positions as commissioned officers in the active duty United States Air Force. On completion of the curriculum, students will have a thorough understanding of the core values, leadership, teamwork, and other requirements to be an effective officer in the world's greatest air force. For more information on the Air Force Science program, contact the Air Force Science Department at the University of Houston by calling 713-743-4932 or on-line at [www.uh.edu/afrotc](http://www.uh.edu/afrotc).

All courses and physical training sessions take place at the University of Houston. Flight orientation occurs at airports in the Houston metro area.

**COURSE CREDIT**

ROTC classes may be taken for elective credit toward any degree plan at Rice University. Freshman and sophomore level classes are open to all students. No military obligation is incurred as a result of enrollment in these courses. Junior and senior level courses are more restrictive and do require a military obligation. ROTC scholarship students also incur a military obligation.

**FOUR-YEAR PROGRAM**

The General Military Course (GMC) is the first half of the four year ROTC program and is taken during the freshman and sophomore years. This program allows the student to experience Air Force ROTC without obligation (unless the student is on an Air Force ROTC scholarship).

Each semester of the GMC consists of one classroom hour of instruction as well as Leadership Laboratory each week.

During the first two years, the student will learn about the Air Force and the historical development of aerospace power.

During the summer preceding the junior year, the student will compete for the opportunity to attend a four-week Field Training Unit. Successful completion of field training is mandatory for entrance into the Professional Officer Course (POC), the junior and senior years of the four-year program.

As a junior, the student will study the core values, leadership, teamwork, and management tools required to become an effective Air Force officer.

During the senior year, students study the national security policy process, participate in regional and cultural studies, and complete final requirements for commissioning as second lieutenants.

Enrollment in the POC is open to graduate students if they have four semesters of school remaining. Each semester of the POC consists of three classroom hours of instruction as well as Leadership Laboratory each week.

## LEADERSHIP LABORATORY

As an Air Force ROTC cadet, each student is required to attend an additional two-hour class known as Leadership Laboratory.

Although not part of the academic class requirement, it is an essential element of officer training. Leadership Laboratory is an intensive military training program in which students gain invaluable leadership and managerial experience while learning about the Air Force way of life. Students have numerous opportunities to hear guest speakers and panel discussions, participate in field trips, and experience practical leadership exercises.

## AFROTC SCHOLARSHIP OPPORTUNITIES

Air Force ROTC offers various scholarship opportunities for students at Rice University:

**In-College Scholarship Program (ICSP)** is a highly competitive scholarship program aimed primarily at college freshmen and sophomores in any major (students with a bachelor's degree can compete to earn a master's degree). The ICSP awards cover tuition capped at either \$15,000 per year plus \$750 per year for books or \$9,000 per year plus \$750 per year for books.

**The Express Scholarship Program** is operated on a fully qualified basis: those who meet the qualifications are awarded the scholarship. Though the list of eligible college majors differs from year to year, the express scholarship pays up to \$15,000 tuition per year and \$750 for books. Recent majors which qualified for express scholarships included electrical engineering, computer science, and strategic foreign languages. The processing of the scholarship award is completed at the local detachment.

## STIPEND

All AFROTC scholarship recipients and POC cadets receive a nontaxable monthly stipend. The annual stipend amount ranges from \$2,000 per year to \$4,000 per year depending on the recipient's enrollment year.

**For additional information** on AFROTC scholarship opportunities, please visit the AFROTC website at [www.afrotc.com](http://www.afrotc.com) or call 1-800-4AFROTC.

## FIELD TRAINING (FT)

Cadets completing the General Military Course attend four weeks of field training (FT) during the summer at a selected Air Force base. Those who have not completed the GMC attend an extended FT Unit. This rigorous program of leadership training, physical conditioning, and academics assesses the cadet's potential to be an Air Force officer.

Cadets also receive survival and firearms training and career information. Cadets receive travel pay and daily pay for FT.

## FLIGHT ORIENTATION PROGRAM

All cadets can volunteer to participate in a joint Air Force ROTC/Civil Air Patrol flight orientation program. This consists of eight flights, four in the front seat of a small passenger aircraft and four additional flights in the back seat as an observer. In addition, an abbreviated flying ground school course is taught in the ROTC classrooms using FAA textbooks. The flight orientation and ground school course are both free for all cadets.

### **PHYSICAL FITNESS TRAINING**

Cadets meet three times per week at 0600 at the University of Houston Alumni Center to perform physical fitness training. The training is mandatory and emphasizes push-ups, sit-ups, and running in preparation for the USAF physical fitness test.

### **PROFESSIONAL DEVELOPMENT TRAINING (PDT)**

Cadets are eligible to compete to attend PDT during the summer months.

PDT consists of several programs, including:

- Tours of nearby active duty Air Force bases
- Soaring and free-fall parachuting at the United States Air Force Academy (USAFA)
- Cultural and foreign language immersion
- Hands-on research at Air Force laboratories
- Shadowing an Air Force officer in Operation Air Force
- Internships at NASA and other government organizations

Cadets receive travel pay and daily pay for the majority of these programs.

For more information, contact Colonel Phil Bossert at 713-743-4932/3707 or visit the University of Houston Air Force website at [www.uh.edu/afrotc](http://www.uh.edu/afrotc).

### **SUMMARY**

During this time of war, our mission of producing Air Force second lieutenants of character, commitment, and courage is more important than ever.

**See AFSC in the Courses of Instruction section (these are University of Houston listings).**

# ANCIENT MEDITERRANEAN CIVILIZATIONS

## THE SCHOOL OF HUMANITIES

### DIRECTOR AND ADVISOR

Michael Maas

### PROFESSORS

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Michael Maas

Susan Keech McIntosh

Donald Ray Morrison

Harvey E. Yunis

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Eva Haverkamp

Matthias Henze

Hilary S. Mackie

Carol E. Quillen

Paula Sanders

### ASSISTANT PROFESSORS

Scott McGill

Caroline Quenemoen

### DEGREE OFFERED: BA

This interdisciplinary major in the cultures of ancient Greece and Rome, Judaism, early Christianity, and early Islam, as well as their antecedents, explores these traditions both for their intrinsic interest and for the contributions each has made to contemporary Western society. Our combined focus on ancient cultural history in its broadest sense and on perspectives offered by cultural criticism enables students to examine the beginnings of the civilization in which they now participate.

Courses for this major address common questions about the transmission and transformation of cultures in the ancient Mediterranean world. Students examine sources, such as texts, artifacts, and institutions, that illuminate the process. They study how shifting cultural centers and frontiers in this world are delineated, and they explore the general integration and disintegration of specific ancient cultures. This major also offers opportunities for archaeological fieldwork and study abroad.

Rice is a sponsor of the American School of Classical Studies at Athens, the American School of Oriental Research, and the Intercollegiate Center for Classical Studies in Rome. Students majoring in Ancient Mediterranean Civilizations are encouraged to study in these programs as well as in the College Year in Athens program.

### DEGREE REQUIREMENTS FOR BA IN ANCIENT MEDITERRANEAN CIVILIZATIONS

Students must take 1 course from 3 of the 5 following categories: 1) Graeco-Roman Civilization, 2) Islamic Civilization, 3) Jewish Civilization, 4) Christian Civilization, and 5) Archaeological Methods & Theory. In addition, students must take 1 course that addresses the creation, transmission, and reception of traditions in the Mediterranean world. Courses that meet this requirement are designated as "Themes Across Time."

Students also must fulfill a comparative requirement by taking either 1 course that, in and of itself, treats 2 different cultural traditions (designated "Comparative") or 2 separate courses on similar themes but from different cultures (e.g. Women in Greece & Rome, Women in the Islamic World). Although not required, courses in ancient languages are recommended. A minimum of 5 courses must be taken at the 300-level or above.

For general university requirements, see the Graduation Requirements in this publication. Majors in Ancient Mediterranean Civilizations must complete at least 30 semester hours (10 courses). Students may select from the following courses to fulfill their requirements for the major.

Please note that not all courses listed below will be offered during the academic year. For a current list of AMC courses that will be offered in fall 2007 and spring 2008, please visit the AMC website at [amc.rice.edu](http://amc.rice.edu).

### ***Graeco-Roman Civilization***

- ANTH 321 *Text as Property, Property as Text: Across the Ages*
- ANTH 325 *Sex, Self, and Society in Ancient Greece*
- ANTH 363 *Early Civilizations*
- CLAS 101 *Socrates: The Man and His Philosophy*
- CLAS 107 *Greek Civilization and Its Legacy*
- CLAS 108 *Roman Civilization and Its Legacy*
- CLAS 209 *Greek and Roman Drama*
- CLAS 220 *The Novel in Classical Antiquity*
- CLAS 225 *Women in Greece and Rome*
- CLAS 235 *Classical Mythology: Interpretation, Origins, and Influence*
- CLAS 311 *Text as Property, Property as Text: Across the Ages*
- CLAS 312 *Greek Art and Architecture*
- CLAS 315 *Roman Art and Architecture*
- CLAS 316 *Democracy and Political Theory in Ancient Greece*
- CLAS 318 *The Invention of Paganism in the Roman Empire*
- CLAS 320 *The Age of Augustus*
- CLAS 336 *The Origin of the Languages of Europe*
- CLAS 337 *Epic and Novel*
- ENGL 335 *Epic and Novel*
- FSEM 101 *Socrates: The Man and His Philosophy*
- FSEM 151 *The Hero and His Companion from Gilgamesh to Sam Spade*
- GREE 101 *Introduction to Ancient Greek I*
- GREE 102 *Elementary Greek II*
- GREE 201 *Intermediate Greek I: Prose*
- GREE 202 *Intermediate Greek II: Prose*
- GREE 301 *Advanced Greek*
- HART 204 *Art as Civilization*
- HART 218 *Special Topics: Ancient Greek Sites*
- HART 219 *Independent Study: Ancient Art*
- HART 228 *Special Topics: Christian, Byzantine, and Islamic Art*
- HART 229 *Independent Study: Christian, Byzantine, and Islamic Art*
- HART 312 *Greek Art and Architecture*
- HART 315 *Roman Art and Architecture*
- HART 320 *The Age of Augustus*
- HART 417 *Buried Cities: The Art and Architecture of Akrotiri, Pompeii, and Herculaneum*
- HART 428 *Special Topics: Early Christian, Byzantine, and Islamic Art*
- HART 429 *Independent Study: Early Christian, Byzantine, and Islamic Art*
- HIST 113 *God, Time, and History*
- HIST 151 *The Hero and His Companion from Gilgamesh to Spiderman*
- HIST 200 *Origins of Western Civilizations: Ancient Empires*
- HIST 202 *Introduction to Medieval Civilization: The Early Middle Ages*
- HIST 223 *Empires and Communities in the Middle Ages*
- HIST 257 *Jews and Christians in Medieval Europe*
- HIST 262 *Rome: City and Empire*
- HIST 307 *Imperial Rome from Caesar to Diocletian*
- HIST 308 *The World of Late Antiquity*
- HIST 316 *The Invention of Paganism in the Roman Empire*
- HIST 323 *Empires and Communities in the Middle Ages*
- HIST 357 *Jews and Christians in Medieval Europe*
- HIST 358 *European Intellectual History from Augustine to Descartes*
- HIST 382 *Classical Islamic Cultures*



HIST 437 *Christians and Jews in the Medieval Islamic World*  
 HIST 438 *Women and Gender in the Medieval Islamic Societies*  
 HIST 460 *Advanced Seminar in Ancient History*  
 HUMA 109 *Greek Civilization and Its Legacy*  
 HUMA 113 *God, Time, and History*  
 LATI 101 *Elementary Latin I*  
 LATI 102 *Elementary Latin II*  
 LATI 201 *Intermediate Latin I: Prose*  
 LATI 202 *Intermediate Latin II*  
 LATI 301 *Advanced Latin: Literature of Exile in the Roman Tradition*  
 LATI 302 *Advanced Latin: Roman Epic*  
 LATI 303 *Advanced Latin: Plautus and Terence*  
 LATI 311 *Latin Pastoral Poetry*  
 LATI 312 *Advanced Latin: Ovid*  
 LATI 313 *Cicero and Catullus: Literature and Society in the Roman Republic*  
 MDST 101 *Elementary Latin I*  
 MDST 102 *Elementary Latin II*  
 MDST 202 *Introduction to Medieval Civilization: The Early Middle Ages*  
 MDST 211 *Intermediate Latin I: Prose*  
 MDST 212 *Intermediate Latin II*  
 MDST 223 *Empires and Communities in the Middle Ages*  
 MDST 257 *Jews and Christians in Medieval Europe*  
 MDST 308 *The World of Late Antiquity*  
 MDST 357 *Jews and Christians in Medieval Europe*  
 MDST 358 *European Intellectual History from Augustine to Descartes*  
 MDST 382 *Classical Islamic Cultures*  
 MDST 385 *Christians and Jews in the Medieval Islamic World*  
 MDST 438 *Women and Gender in the Medieval Islamic Societies*  
 MDST 460 *Advanced Seminar in Ancient History*  
 RELI 123 *God, Time, and History*  
 RELI 316 *The Invention of Paganism in the Roman Empire*

WGST 225 *Women in Greece and Rome*  
 WGST 332 *Sex, Self, and Society in Ancient Greece*  
 WGST 455 *Women and Gender in the Medieval Islamic Societies*

### **Islamic Civilization**

ASIA 221 *The Life of the Prophet Mubammad*  
 ASIA 441 *Popular Religion in the Middle East*  
 HIST 382 *Classical Islamic Cultures*  
 HIST 437 *Christians and Jews in the Medieval Islamic World*  
 HIST 438 *Women and Gender in the Medieval Islamic Societies*  
 MDST 382 *Classical Islamic Cultures*  
 MDST 385 *Christians and Jews in the Medieval Islamic World*  
 MDST 438 *Women and Gender in the Medieval Islamic Societies*  
 RELI 141 *Introduction to Islam*  
 RELI 221 *The Life of the Prophet Muhammad*  
 RELI 223 *Qur'an and Commentary*  
 RELI 350 *Sacred Scriptures in Monotheistic Faiths*  
 WGST 455 *Women and Gender in the Medieval Islamic Societies*

### **Jewish Civilization**

HIST 113 *God, Time, and History*  
 HUMA 113 *God, Time, and History*  
 RELI 122 *The Bible and Its Interpreters*  
 RELI 123 *God, Time, and History*  
 RELI 125 *Introduction to Biblical Hebrew I*  
 RELI 126 *Introduction to Biblical Hebrew II*  
 RELI 127 *Intermediate Biblical Hebrew I*  
 RELI 128 *Intermediate Biblical Hebrew II*  
 RELI 209 *Introduction to Judaism*  
 RELI 210 *Elbics in Judaism*  
 RELI 350 *Sacred Scriptures in Monotheistic Faiths*  
 RELI 383 *The Dead Sea Scrolls*

### **Christian Civilization**

RELI 122 *The Bible and Its Interpreters*  
 RELI 125 *Introduction to Biblical Hebrew I*  
 RELI 126 *Introduction to Biblical Hebrew II*  
 RELI 127 *Intermediate Biblical Hebrew I*

RELI 128 *Intermediate Biblical Hebrew II*

RELI 223 *Qur'an and Commentary*

RELI 243 *The Book of Genesis*

RELI 282 *Introduction to Christianity*

RELI 350 *Sacred Scriptures in  
Monotheistic Faiths*

RELI 381 *The Messiah*

RELI 383 *The Dead Sea Scrolls*

RELI 410 *Apocalypse Then and Now*

### **Archaeological Methods and Theory**

ANTH 203 *Human Antiquity: An Introduction  
to Physical Anthropology and Prehistory*

ANTH 205 *Introduction to Archaeology*

ANTH 345 *The Politics of the Past: Archaeology  
in Social Context*

ANTH 362 *Archaeological Field Techniques*

ANTH 363 *Early Civilizations*

ANTH 425 *Advanced Topics in Archaeology*

ANTH 460 *Advanced Archaeological Theory*

### **Themes Across Time**

ANTH 321 *Text as Property, Property as Text:  
Across the Ages*

ANTH 363 *Early Civilizations*

CLAS 311 *Text as Property, Property as Text:  
Across the Ages*

FSEM 151 *The Hero and His Companion from  
Gilgamesh to Sam Spade*

HART 101 *Introduction to the History of  
Western Art: Prehistoric to Gothic*

HIST 113 *God, Time, and History*

HIST 151 *The Hero and His Companion from  
Gilgamesh to Spiderman*

HIST 200 *Origins of Western Civilizations:  
Ancient Empires*

HIST 308 *The World of Late Antiquity*

HIST 358 *European Intellectual History from  
Augustine to Descartes*

HUMA 113 *God, Time, and History*

MDST 308 *The World of Late Antiquity*

MDST 358 *European Intellectual History from  
Augustine to Descartes*

PHIL 201 *History of Philosophy I*

PHIL 301 *Ancient and Medieval Philosophy*

PHIL 307 *Social and Political Philosophy*

PHIL 327 *History of Social and  
Political Philosophy*

RELI 123 *God, Time, and History*

### **Comparative**

CLAS 209 *Greek and Roman Drama*

CLAS 225 *Women in Greece and Rome*

CLAS 336 *The Origin of the Languages  
of Europe*

CLAS 337 *Epic and Novel*

ENGL 335 *Epic and Novel*

HIST 357 *Jews and Christians in  
Medieval Europe*

HIST 437 *Christians and Jews in the Medieval  
Islamic World*

HIST 438 *Women and Gender in the Medieval  
Islamic Societies*

MDST 357 *Jews and Christians in  
Medieval Europe*

MDST 385 *Christians and Jews in the Medieval  
Islamic World*

MDST 438 *Women and Gender in the Medieval  
Islamic Societies*

PHIL 501 *Seminar in Ancient and  
Medieval Philosophy*

WGST 225 *Women in Greece and Rome*

WGST 455 *Women and Gender in the Medieval  
Islamic Societies*

# ANTHROPOLOGY

## THE SCHOOL OF SOCIAL SCIENCES

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George E. Marcus

Patricia Seed

### ADJUNCT ASSOCIATE PROFESSOR

Deepa Reddy

### ADJUNCT ASSISTANT PROFESSOR

Richard A. Nisbett

### DEGREES OFFERED: BA, MA, PHD

The major in anthropology has 2 areas of concentration: cultural anthropology and archaeology. The focus in cultural anthropology is on contemporary theoretical issues. By reading primary sources, students gain an exposure to the styles of argument and reasoning of a broad range of theorists. They then can engage in the ongoing discussion and definition of central problems within the field. Fieldwork and ethnography are important in the doctoral research.

In archaeology, the focus is on research skills in the library, the field, and the laboratory. Most students also develop at least 1 analytical skill, such as remote sensing, archaeological statistics, osteology, or geomorphology, drawing on the university's extensive laboratory and computer facilities.

Students may organize a major in one or both fields or combine a major in anthropology with 1 in another discipline.

### DEGREE REQUIREMENTS FOR BA IN ANTHROPOLOGY

For general requirements, see Graduation Requirements (pages 14–15).

Students majoring in anthropology must:

- Complete a total of 30 semester hours of approved courses (10 hours), at least 24 of which should be anthropology courses and at least 18 hours of which should be taken at the 300-level or above
- Successfully pass 3 of the following 5 courses or categories of courses:
  - ANTH 200 *Introduction to the Scientific Study of Languages or*
  - ANTH 313 *Language and Culture*
  - ANTH 201 *Introduction to Social/Cultural Anthropology*
  - ANTH 203 *Human Antiquity*
  - ANTH 205 *Introduction to Archaeology*
  - ANTH 298 *Biotechnology, 1900 to Now*
- Successfully pass 3 of the following 4 courses:
  - ANTH 302 *Anthropological Theory: A Survey*
  - ANTH 314 *Genetics*
  - ANTH 345 *The Politics of the Past*
  - ANTH 455 *Introduction to Science and Technology Studies*

- Successfully complete either:
  - ANTH 490 and ANTH 491 *Directed Honors Research*, or
  - ANTH 495 *Capstone in Anthropology*

With the approval of the undergraduate advisor, students may substitute for departmental courses at most 6 hours of courses from outside the major that are related to their plan of study. The department recommends that students intending to pursue graduate study acquire a reading knowledge of 1 or 2 European languages.

**Honors Program**—Majors considering a career in anthropology should apply to the honors program, as should those who wish to include advanced training and an intensive, individual research project in their undergraduate education. Anthropology faculty determine acceptance into the program. More information is available from the department office; see also Honors Programs (page 26).

### ARCHAEOLOGICAL FIELD SCHOOL ON GORÉE ISLAND, SENEGAL

The Department of Anthropology offers a 6-week field school in June and July on the island of Gorée, located off the coast of Senegal, just a short ferry ride away from the capital city of Dakar. The field school excavations are part of ongoing investigations into the growth and development of Gorée as a supply port for the Atlantic trade, occupied and serviced by a polycultural population of slaves, Europeans, mainland Africans, and mixed-race female landowners, known as *signares*. Two courses, ANTH 364 and 370, are offered for a total of 6 hours credit. The courses are offered without specific prerequisites, but there is a general requirement that students have some prior coursework in archaeology or African history. Program fees apply.

### DEGREE REQUIREMENTS FOR MA AND PHD IN ANTHROPOLOGY

Because each field of specialization offers different opportunities for training and different research orientations, the department seeks applicants with a defined interest in either cultural anthropology or archaeology; an undergraduate background in anthropology is desirable but not required. Entering students devise a detailed 1st-year plan of study and provisional plans for succeeding years in consultation with an advisor. The plan should emphasize broad training in the selected field before the eventual definition of a project for dissertation research. For general university requirements, see Graduate Degrees (pages 57-58).

**MA Program**—Graduate students may earn the MA after obtaining approval of their candidacy for the PhD. For the MA as a terminal degree, students must complete:

- 30 semester hours of approved course work
- 1 of the 3 special papers required for the PhD
- A thesis

**PhD Program**—For the PhD degree, students must accomplish the following:

- Complete 3 substantial papers, each emphasizing an analytical, research, and writing skill appropriate to their field of specialization (should be completed during the first 2 years of study)
- Demonstrate reading competency in 1 foreign language
- Prepare a satisfactory proposal for dissertation research, based in substantial part on field research
- Complete and defend the dissertation

**Special Options**—The department will arrange seminars and tutorials on any topic relevant to a student's training; these seminars may be conducted in supervisory consultation with scholars in other disciplines as well as with adjunct faculty. Students interested in the specialized field of medical anthropology may take advantage of the extensive resources of the Texas Medical Center through ties established with the University of Texas School of Public Health

and Graduate School of Biomedical Sciences; students may earn degree credit for formal courses taken at both schools.

**Financial Support**—All 1st-year students receive the same level of support: a combination of graduate fellowships and tuition scholarships. These awards are renewed for a further 3 years of study.

**See ANTH in the Courses of Instruction section.**

# APPLIED PHYSICS GRADUATE PROGRAM

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## THE RICE QUANTUM INSTITUTE

### **DIRECTOR OF APPLIED PHYSICS GRADUATE PROGRAM**

D. Natelson

### **PARTICIPATING FACULTY**

This program is open to faculty from physics and astronomy, chemistry, mechanical engineering and materials science, electrical and computer engineering, bioengineering, computational and applied mathematics, civil and environmental engineering, and chemical and biomolecular engineering.

### **DEGREES OFFERED: MS, PHD**

A joint effort of both the natural sciences and the engineering divisions at Rice and overseen by the Rice Quantum Institute (RQI), the Applied Physics Program (APP) is administered by a committee composed of members from the participating departments mentioned above. The objective is to provide an interdisciplinary graduate education in the basic science that underlies important technology. The faculty believes that the experience obtained by performing research at the intellectually stimulating interface of physical science and engineering is particularly effective in producing graduates who succeed in careers based on new and emerging technologies.

Due to the interdisciplinary nature of the program, students can access virtually any of the research facilities in either the natural sciences or engineering schools of Rice University. The Applied Physics Committee (APC) urges prospective students to contact individual departments or RQI for detailed descriptions of research facilities and ongoing research projects. Within RQI alone, there are more than 100 separate projects, and there are numerous other research opportunities.

### **DEGREE REQUIREMENTS**

The Applied Physics Program (APP) offers master's and PhD degrees. For each degree, the student must fulfill the university requirements set forth in the catalog under which he/she entered. The semester hour requirements may be fulfilled both by classroom hours and research hours. A total of 9 one-semester graduate level courses is required for the master's degree in applied physics, ordinarily a requirement for advancement to candidacy in the PhD program. Four of these are core courses required of all students, and 5 are elective courses chosen according to individual research goals. The Applied Physics Committee (APC) may waive some course requirements for students who demonstrate a thorough knowledge of material in 1 or more core/elective course(s). Full requirements are available on line at [rqj.rice.edu/academics/graduate/APPrequirements.pdf](http://rqj.rice.edu/academics/graduate/APPrequirements.pdf).

By the end of the 3rd year in the program, all APP students should have completed the university requirements for a master's degree, fulfilled the course requirements of the APP, and defended a master's thesis in a public oral examination by a committee approved by the APC. The examination covers the work reported in the thesis as well as the entire field in which

the student intends to work toward the PhD. The examining committee votes separately on awarding the master's degree and on admission to candidacy for the PhD. The student also must fulfill the teaching requirements set by the host department to achieve candidacy. Fulfillment of all university degree requirements and successful defense of a PhD thesis in a public examination by an APC-approved committee is necessary for the PhD.

### **Core courses**

*Quantum Mechanics I* (PHYS 521 or CHEM 530)

*Quantum Mechanics II* or *Statistical Physics* (PHYS 522 or PHYS 526 or CHEM 531 or CHEM 520)

*Classical Electrodynamics* (PHYS 532)

*Introduction to Solid State Physics I* (PHYS 563/ELEC 563)

It is assumed that the student has an adequate background in classical mechanics, electrostatics, and statistical and thermal physics. This background is determined from interviews or exams given to entering students by the APC or the host department.

### **Elective courses (5 required)**

BIOE 584 *Lasers in Medicine and Bioengineering*

BIOE 589/BIOS 589 *Computational Molecular Biophysics*

BIOE 610/PHYS 600 *Methods of Molecular Simulation/Advanced Topics in Physics*

CENG 630 *Chemical Engineering of Nanostructured Materials*

CHEM 495 *Transition Metal Chemistry*

CHEM 515 *Chemical Kinetics & Dynamics*

CHEM 520 *Classical and Statistical Thermodynamics*

CHEM 530 *Quantum Mechanics I/Quantum Chemistry*

CHEM 531 *Quantum Mechanics II/Quantum Chemistry*

CHEM 533 *Nanostructure & Nanotechnology*

CHEM 547 *Supramolecular Chemistry*

CHEM 611 *High Temperature and High Pressure Chemistry*

CHEM 630 *Molecular Spectroscopy and Group Theory*

ELEC 462 *Semiconductor Devices*

ELEC 463 *Lasers and Photonics*

ELEC 465 *Physical Electronics Practicum*

ELEC 560 *Linear/Nonlinear Fiber Optics*

ELEC 561 *Topics in Semiconductor Manufacturing*

ELEC 562 *Submicrometer & Nanometer Device Technology*

ELEC 564/PHYS 564 *Introduction to Solid State Physics II*

ELEC 565 *Topics in Quantum Semiconductor Nanostructures*

ELEC 567 *Applied Quantum Mechanics*

ELEC 568 *Laser Spectroscopy*

ELEC 569 *Ultrafast Optics*

ELEC 591 *Optics*

ELEC 592 *Topics in Quantum Optics (Nonlinear Optics)*

ELEC 603 *Topics in Micro- and Nanophotonics*

ELEC 691 *Seminar Topics in Nanotechnology*

MECH 679 *Applied Monte Carlo Analysis*

MECH 682 *Convective Heat Transfer*

MECH 683 *Radiative Heat Transfer I*

MECH 684 *Radiative Heat Transfer II*

MSCI 402 *Mechanical Properties of Materials*

MSCI 523 *Properties, Synthesis, and Design of Composite Materials*

MSCI 535 *Crystallography and Diffraction*

MSCI 597 *Polymer Synthesis, Soft Materials, and Nanocomposites*

MSCI 610 *Crystal Thermodynamics*

MSCI 614 *Principles of Nanoscale Mechanics*

MSCI 615 *Thin Film Failure Analysis, Measurement, and Reliability*

MSCI 623 *Analytical Spectroscopies*

MSCI 634 *Thermodynamics of Alloys*

MSCI 635 *Transformation of Alloys*

MSCI 645/ELEC 645 *Thin Films*

MSCI 666 *Conduction Phenomena in Solids*

PHYS 480 *Introduction to Plasma Physics*

PHYS 512 *Ionospheric Physics*

PHYS 515 *Classical Dynamics*

PHYS 516 *Mathematical Methods*

PHYS 521 *Quantum Mechanics I*

PHYS 522 *Quantum Mechanics II*

PHYS 526 *Statistical Physics*

PHYS 533/534 *Nanostructures and Nanotechnology I/II*

PHYS 537/538 *Methods of Experimental Physics I/II*

PHYS 539 *Characterization and Fabrication at the Nanoscale*

PHYS 552 *Molecular Biophysics*

PHYS 564/ELEC 564 *Introduction to Solid State Physics II*

PHYS 566 *Surface Physics*

PHYS 568 *Quantum Phase Transitions*

PHYS 571 *Modern Atomic Physics and Quantum Optics*

PHYS 572 *Fundamentals of Quantum Optics*

PHYS/ELEC 605 *Computational Electrodynamics and Nanophotonics*

PHYS 663 *Condensed Matter Theory: Applications*

PHYS 664 *Condensed Matter Theory: Many-Body Formalism*

No courses may be used for both core and elective courses. Due to overlap of curricula, only 1 from each of the pairs PHYS 521/CHEM 530, PHYS 522/CHEM 531, and PHYS 526/CHEM 520 may be used for the 9 required courses.



# ARCHITECTURE

## THE SCHOOL OF ARCHITECTURE

### DEAN

Lars Lerup

### ASSOCIATE DEAN

John J. Casbarian

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William T. Cannady

Carlos Jimenez

Albert H. Pope

Gordon G. Wittenberg Jr.

### ASSOCIATE PROFESSORS

Farès el-Dahdah

Sanford Kwinter

Spencer W. Parsons

### ASSISTANT PROFESSORS

Dawn Finley

David Guthrie

Christopher Hight

Sean Lally

Nana Last

Clover Lee

### LECTURERS

Alan Fleishacker

James Furr

Tom Lord

Frank S. White

### PROFESSORS IN PRACTICE

Nonya S. Grenader

Douglas E. Oliver

### ADJUNCT LECTURER

Stephen Fox

### VISITING SMITH PROFESSOR

Danny M. Samuels

### VISITING CULLINAN PROFESSOR

Mark Wamble

## DEGREES OFFERED: BA, BARCH, MARCH, MARCH IN URBAN DESIGN, DARCH

The principal goal of the School of Architecture is to contribute to a more humane environment. The school focuses on teaching and research, the development of a broad liberal education for undergraduates in the allied sciences and arts of architecture, and professional graduate and postgraduate education in architecture and urban design. Intimate student-faculty interaction, academic freedom, and unrestricted institutional cooperation within and outside the university are distinctive qualities of the architecture degree programs at Rice.

*"In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board, which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes 2 types of degree: the Bachelor of Architecture and the Master of Architecture. A program may be granted a 6-year, 3-year, or 2-year term of accreditation, depending on its degree of conformance with established educational standards.*

*Master's degree programs may consist of a preprofessional undergraduate degree and a professional degree, which, when earned sequentially, comprise an accredited professional education. However, the professional degree is not, by itself, recognized as an accredited degree."*—National Architectural Accrediting Board

The undergraduate programs maintain a balance between academic studies and professional practice. Lectures and other public programs, visiting faculty,

scholarly presentations, and the Preceptorship Program, which provides a 1-year internship in outstanding architectural offices throughout the United States, Europe, and Japan, all complement the school's core of distinguished teachers and practitioners.

The graduate programs have three areas of emphasis: architectural design, with particular attention paid to history, theory, and practice; urban design, where the concern is the emerging form of the American city; and research in computer visualization, which uses the resources of the state-of-the-art Rice Advanced Visualization Lab.

## DEGREE REQUIREMENTS FOR BA IN ARCHITECTURE OR ARCHITECTURAL STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). The conditions specified here for each major also satisfy the university distribution requirements.

**BA in Architecture**—The curriculum for architecture majors is divided into a foundation sequence taken in the freshman and sophomore years and a preprofessional sequence taken in the junior and senior years. The foundation sequence consists of 4 semesters of design studios and other related courses in architecture. The 1st-semester studio develops basic design skills through directed explorations and problem-solving exercises in form, texture, color, material, and structures. In the subsequent 3 studios, through a carefully sequenced series of exercises, students are introduced to a broad range of architectural design issues, processes, and methods. Students are required to take 4 courses in the history and theory of art and architecture during the freshman and sophomore years in addition to 2 semesters of architectural technology. They also must complete university distribution requirements. It is recommended that students take an introductory drawing course during their first 2 years of study to develop visual skills.

Students who satisfactorily complete the foundation sequence may, upon approval of their major, enter the junior and senior year preprofessional sequence. The fall studios for the 3rd and 4th years are organized around the workshop model and emphasize urban design issues, digital media applications, and comprehensive building design. The spring studios are vertically integrated, allowing students to select offerings emphasizing specialized design topics such as technology, landscape design, historical precedent, sustainable design, and project delivery systems. During the 3rd and 4th years, students are required to take 2 additional technology courses and to fulfill all remaining school or university distribution requirements. Students wishing to pursue the professional degree in architecture may apply for admission to the Bachelor of Architecture (BArch) degree program during the 2nd semester of the 4th year.

**BA in Architectural Studies**—As an alternative to the preprofessional degree sequence, and open only to students who have been admitted as architecture majors and have completed the 2-year foundation program, the Architectural Studies curriculum is an option. The first 4 semesters of the curriculum are identical to the foundation sequence of the architecture major except for the omission of 1 technology course. Subsequent requirements are the completion of an additional studio and 4 elective courses in architecture. The program provides basic preparation for later professional study while allowing other academic interests to be pursued at greater depth.

## TYPICAL CURRICULUM FOR BA IN ARCHITECTURE

### **1st Semester**

ARCH 101 *Principles of Architecture I*  
 HART 101 *Introduction to History of Art*  
 PHYS 101 *Mechanics (with lab)*  
 LPAP 101 *Lifetime Physical Activities*  
 Approved architecture-restricted distribution course in humanities

### **2nd Semester**

ARCH 102 *Principles of Architecture I*  
 ARCH 132 *Freshman Seminar*  
 HART 102 *Introduction to History of Art*  
 LPAP 102 *Lifetime Physical Activities*  
 MATH 101 *Single Variable Calculus*  
 Approved architecture-restricted distribution course in humanities

### **3rd Semester**

ARCH 201 *Principles of Architecture II*  
 ARCH 207 *Introduction to the Design of Structures*  
 ARCH 345 *Architecture and the City I*  
 Studio Art Elective\*  
 Elective\*

### **4th Semester**

ARCH 202 *Principles of Architecture II*  
 ARCH 214 *Design of Structures II*  
 ARCH 346 *Architecture and the City II*  
 Approved architecture-restricted distribution course in social sciences  
 Elective\*

### **5th Semester**

ARCH 301 *Principles of Architecture III*  
 ARCH 316 *Design of Structures III*  
 Architectural Theory Elective  
 Elective\*  
 Elective\*

### **6th Semester**

ARCH 302 *Principles of Architecture III*  
 ARCH 315 *Building Climatology*  
 Elective\*  
 Elective\*  
 Elective\*

### **7th Semester**

ARCH 401 *Principles of Architecture IV*  
 Elective\*  
 Elective\*  
 Elective\*

### **8th Semester**

ARCH 402 *Principles of Architecture IV*  
 Elective\*  
 Elective\*  
 Elective\*

\*All courses must be selected to satisfy both architecture major requirements and university distribution requirements.

## DEGREE REQUIREMENTS FOR A BACHELOR OF ARCHITECTURE (BARCH)

The Bachelor of Architecture program is open only to students who have completed the undergraduate preprofessional architecture program at Rice. Upon admission, students are assigned a preceptorship, which takes place immediately after receipt of the Bachelor of Arts in Architecture degree. The preceptorship program balances academic learning with professional experience. Qualified students who have been admitted to the BArch degree program are assigned to work for a year in the United States or abroad with leading architectural offices designated by the school as preceptors. The BArch degree requires the successful completion of the BA in architecture, completion of the 2-semester preceptorship, and completion of 2 graduate studios and 5 approved lecture or seminar courses.

**PRECEPTORS****Allied Works**

Portland

**Arquitectonica**

Miami

**Cambridge Seven Associates**

Cambridge

**Gensler**Houston, London, Los Angeles,  
San Francisco, Santa Monica**Michael Graves Architects**

Princeton

**Kohn Pedersen Fox, Architects**

London, New York

**Lake/Flato Architects**

San Antonio

**Machado-Silvetti Associates**

Boston

**Richard Meier and Partners**

Los Angeles

**Mitchell Giurgola**

New York

**NBBJ**

Seattle

**Office dA, Inc**

Boston

**Ong & Ong Architects**

Singapore

**Pei, Cobb, Freed & Partners**

New York

**Pelli Clarke Pelli**

New Haven

**Renzo Piano Building Workshop**

Genoa, Paris

**Robert A. M. Stern Architects**

New York

**Rogers Marvel Architecture**

New York

**SOM**

San Francisco

**Venturi Scott-Brown & Associates**

Philadelphia

**Weiss/Manfredi Architects**

New York

**Zimmer Gunsul & Frasca**

Los Angeles

**MASTER OF ARCHITECTURE**

The Master of Architecture (MArch) program prepares graduates for a full range of professional activities in the field of architecture. It is offered to individuals who possess a bachelor's degree. Students follow a course of study in all 4 areas of the curriculum: design; history, theory, and criticism; structures, practice, and environments; and computing, logic, and representation. These areas of study are sustained by groups of courses from which students may choose offerings according to the requirements of their particular program. Strong emphasis is given to developing design skills, logic, and imagination through an intensive series of design studio courses. Students also are required to prepare an independent thesis before graduating. A potential exists for dual degrees.

The Master of Architecture program is accredited by the National Architectural Accrediting Board. It leads to the degree of Master of Architecture, which qualifies graduates to take the state professional licensing examination after completing the required internship in an architectural office.

**Programs of Study**—Three program options are available at the Master of Architecture level. Options 1, 2, and 3 differ according to the bachelor's degree received before entering the graduate program.

**OPTION 1**

**Seven-Semester Program**—Option 1 is offered to individuals who hold a 4-year undergraduate degree with a major in a field other than architecture. Preference for admission is given to those who have completed a balanced education in the arts, sciences, and humanities. A minimum of 2 semesters of

college-level courses in the history of art and/or architecture are recommended, as is a minimum of one semester of college-level courses in mathematics or physics. Previous preparation in the visual arts also is desirable, as are courses in philosophy, literature, and economics.

To graduate, students must complete a 4-semester core curriculum (76 credit hours), which is followed by a 3-semester advanced curriculum (57 credit hours). Course work in both core and advanced curricula consists of 7 studios (including thesis) and 20 distribution courses (133 credit hours).

## Core Curriculum

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### 1st Semester

ARCH 501 *Core Design Studio I*

ARCH 507 *Introduction to Design of Structures II*

ARCH 635 *Architecture Computer Graphics Overview*

ARCH 685 *Architecture and Society I*

### 2nd Semester

ARCH 502 *Core Design Studio II*

ARCH 514 *Design of Structures II*

ARCH 532 *Introduction to Digital Visualization and Communication*

ARCH 686 *Architecture and Society II*

### 3rd Semester

ARCH 503 *Core Design Studio III*

ARCH 516 *Environmental Control Systems*

ARCH 683 *20th-Century History of Ideas in Architecture*

Distribution Elective (*Computing, Logic, and Representation*)

### 4th Semester

ARCH 504 *Architectural Problems*

ARCH 515 *Design of Structures III*

ARCH 623 *Professionalism and Management in Architecture*

Distribution Elective (*History, Theory, and Criticism*)

## Advanced Curriculum

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### 5th Semester

ARCH 601 *Architectural Problems*

Distribution Elective (*History, Theory, and Criticism*)

Distribution Elective (*Computing, Logic, and Representation*)

Elective

### 6th Semester

ARCH 602 *Architectural Problems*

ARCH 702 *PreThesis Preparation*

Distribution Elective (*Structures, Practice, and Environments*): *Sustainability*

Elective

### 7th Semester

ARCH 703 *Thesis Studio* or equivalent

Elective

Elective

## OPTION 2

**5-Semester Program**—Option 2 is offered to individuals who hold a 4-year undergraduate degree with a major in architecture. Preference for admission is given to those who have successfully completed between 4 and 6 semesters of undergraduate design studio as well as undergraduate courses that are analogous to those given in the 1st year of Option 1. A minimum of 2 semesters of college-level courses in the history of art and/or architecture are recommended; as is a minimum of 1 semester of college-level courses in mathematics and physics.

Students in this program enter into the 2nd year of the core curriculum (2 semesters, 38 credit hours), followed by the advanced curriculum (3 semesters, 57 credit hours). Course work in both core and advanced curricula consists of 5 studios (including thesis) and 14 distribution courses (95 credit hours).

**1st Semester**ARCH 503 *Core Design Studio III*ARCH 516 *Environmental Control Systems*ARCH 683 *20th-Century History of Ideas in Architecture*Dist. Elective (*Computing, Logic, and Representation*)**2nd Semester**ARCH 504 *Architectural Problems*ARCH 515 *Design of Structures III*ARCH 623 *Professionalism and Management in Architecture*Distribution Elective (*History, Theory, and Criticism*)**Advanced Curriculum**

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**3rd Semester**ARCH 601 *Architectural Problems*Distribution Elective (*History, Theory, and Criticism*)Distribution Elective (*Computing, Logic, and Representation*)  
Elective**4th Semester**ARCH 602 *Architectural Problems*ARCH 702 *Prelthesis Preparation*Distribution Elective (*Structures, Practice, and Environments*): *Sustainability*  
Elective**5th Semester**ARCH 703 *Thesis Studio\**

Elective

Elective

\*or an approved alternative

**OPTION 3**

**3-Semester Program**—Option 3 is offered to individuals who hold a professional degree in architecture (BArch) or its equivalent from a foreign university. Preference for admission is given to those who have significant practical experience in architecture and who have demonstrated high achievement in design.

To graduate, students must complete a 3-semester advanced curriculum of elective courses. Course work consists of 3 studios (including thesis) and 8 distribution courses (57 credit hours).

**1st Semester**ARCH 601 *Architectural Problems*Distribution Elective (*History, Theory, and Criticism*)Distribution Elective (*Computing, Logic, and Representation*)

Elective

or

ARCH 610 *History, Theory/RSAP*ARCH 620 *Architectural Problems/RSAP*ARCH 702 *Prelthesis Preparation*Distribution Elective (*Structures, Practice, and Environments*)

Elective

or

ARCH 610 *History, Theory/RSAP*ARCH 620 *Architectural Problems/RSAP***3rd Semester**ARCH 703 *Thesis Studio*

Elective

Elective

**2nd Semester**ARCH 602 *Architectural Problems*

**Thesis Requirement**—All MArch candidates are required to develop a thesis in partial fulfillment of graduate degree requirements. Students are asked to demonstrate their ability to independently undertake research and analysis and develop a hypothesis and a thorough demonstration of the thesis. This must take the form of either a research thesis (written thesis) or a thesis with a design demonstration (design thesis). Both thesis formats must address architectural consequences that may be derived from within or outside conventional boundaries of the architectural discipline.

Thesis preparation begins in the next-to-last semester with a 3-hour independent study course leading to the submission of a thesis proposal and the selection of a thesis director plus 2 faculty members as readers. While the thesis is independent work carried out by the student under the direction of a chosen advisor, it is organized as a studio in the fall term of the academic year. The thesis studio provides a support setting for both formal and informal review processes throughout the thesis semester. In early January, thesis projects are reviewed by a panel of guest critics and publicly presented in the Farish Gallery.

### **MASTER OF ARCHITECTURE IN URBAN DESIGN**

The Master of Architecture in Urban Design (MAUD) program prepares graduates for a full range of professional activities in the field of urban design. It is offered to individuals who already hold a professional degree qualifying them for registration as architects or landscape architects. The MAUD program makes extensive use of Houston as a setting for case studies and design problems. During the 1st year, strong emphasis is given to developing design skills, logic, and imagination through an intensive series of urban design studio courses. Three additional courses in urban history, planning, and design are required each semester. Students also are required to prepare an independent thesis during their 3rd semester.

### **DOCTOR OF ARCHITECTURE**

Admission to the Doctor of Architecture program requires either a bachelor's or master's degree in architecture and a detailed statement of research concerns and anticipated array of investigation. A student entering with a master's degree normally takes 3 semesters of course work before the qualifying examination. A student with a bachelor's degree normally requires 2 to 5 semesters of course work before the qualifying examination. Preparation for doctoral candidacy may include a foreign language or computer skills. Specific course requirements are established individually when a student is admitted to the program.

After successful completion of all required course work, students may apply to take the qualifying examination after submitting a prospectus outlining their research programs for the doctoral dissertation. The dissertation must represent an original contribution to knowledge in the field of architecture. Completion and successful defense of the dissertation will take a minimum of 1 year. University requirements for thesis (dissertation) preparation and defense must be carefully followed. The time limit for successful defense of the dissertation is established by university policy. Students should not expect to complete the Doctor of Architecture program in less than 4 years of full-time study.

**See ARCH in the Courses of Instruction section.**

# ART HISTORY

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## THE SCHOOL OF HUMANITIES

### CHAIR

Joseph Manca

### PROFESSOR

Joseph Manca

### ASSOCIATE PROFESSORS

Marcia Brennan

Linda E. Neagley

### ASSISTANT PROFESSORS

Robert Leo Costello

Shirine T. Hamadeh

Shih-Shan Susan Huang

Caroline Quenemoen

### ADJUNCT LECTURER

Charles Dove

### POSTDOCTORAL FELLOW

Gordon Hughes

## DEGREES OFFERED: BA

The Department of Art History offers a wide range of courses in European, American, Asian, and Middle Eastern/Islamic art history with additional strengths in architectural history and film and media studies. The major in art history is structured to expose students to the chronological, geographical, and methodological breadth of the field of scholarship.

## DEGREE REQUIREMENTS FOR BA IN ART HISTORY

For general university requirements, see Graduation Requirements (pages 14–15).

Students with a single major in art history must complete 36 hours in art history (12 courses) and double majors must complete 30 hours (10 courses). A total of 6 of the courses for double and single majors must be at the 300 level or above. Of these 6 courses, 2 courses must be in each of the following periods: Pre Modern (antiquity to the medieval period), Early Modern (early modern, or Renaissance in the European context, to the later 18th century), and Modern (later 18th century to the present). Three of these 6 courses also must be in American/European, distributed over the 3 periods; 1 course in Asian from any period; and 1 course in Middle East/Islamic from any period. Of the 12/10 courses for single and double majors, at least 2 courses must be seminars.

It is strongly recommended that majors in art history acquire a proficiency in at least one foreign language.

In addition, art history majors are encouraged to take advantage of the opportunities provided by museum internships, study abroad programs, and travel fellowships.

## TRANSFER CREDIT

With approval from the departmental undergraduate advisor, a maximum of 4 courses may be taken outside of the department and applied to the major as transfer credits or study abroad course credits. No Advanced Placement credits may be used to satisfy major requirements.

See also Transfer Credit in the Information for Undergraduate Students section (page 26).

## HONORS PROGRAM IN ART HISTORY

Art history majors may apply in the spring semester of their junior year for acceptance into the Honors Program. Interested students, with an excellent



academic record, must submit a thesis proposal and recommendation from their thesis advisor to a committee of art historians for review. If accepted, 6 credit hours (included in the 36/30 hours for single and double majors) of directed research and writing would be taken the senior year to complete an honors thesis (HART 402/HART 403). Financial assistance is available for honor students to conduct research between their junior and senior years. In addition to a written thesis, honors students must make a presentation to the faculty and students of the department. Once the advisor and readers have evaluated the completed thesis, the art history faculty determine whether to award honors. Students who do not make satisfactory progress in the 1st term will not be allowed to continue. Students who miss the final thesis deadline (mid-spring semester of the senior year) will receive a grade and credit but no honors.

### **EXHIBITIONS, LECTURES, AND ARTS PROGRAMS AT RICE AND IN HOUSTON**

Houston is fortunate to have some of the best art collections in the United States. The department enjoys a strong and ongoing relationship with the local museums, in particular the Menil Collection and the Museum of Fine Arts, Houston. The department offers opportunities for students to study with local museums, galleries, and alternative art spaces by way of internship courses (HART 400, HART 401, HART 500, HART 501), summer internship working opportunities, fellowships, or collaborative events. The collections and special exhibitions of local museums are often the focus of class lectures and research papers in art history.

The department sponsors the Katherine Brown Distinguished Lectures in Art History, which bring leading scholars to Rice to speak on a wide variety of topics. The department also hosts occasional symposia and lectures in collaboration with other departments, presenting the ideas of top scholars, critics, and artists.

The Department of Art History houses the Visual Resources Center, which currently holds a broad and extensive collection of slides and digital images related to the arts for teaching and research, serving both the department and the university at large.

Exhibitions and related activities organized by the Rice University Art Gallery enrich the university and the Houston community. The Department of Visual Arts mounts several art and photography exhibitions each year and sponsors Rice Cinema, a public alternative film program. Rice Cinema is intimately connected with the curriculum both in film and media studies (HART) and in film and photography production (ARTV) and includes frequent guest lectures, panel discussions, and media events.

**See HART in the Courses of Instruction section.**

# ASIAN STUDIES

## THE SCHOOL OF HUMANITIES AND THE SCHOOL OF SOCIAL SCIENCES

### **DIRECTOR**

Steven W. Lewis

### **PROFESSORS**

Anne C. Klein

Jeffrey J. Kripal

Masayoshi Shibatani

Richard J. Smith

Stephen A. Tyler

### **PROFESSOR OF THE PRACTICE**

Steven W. Lewis

Diana L. Strassman

### **PROFESSOR EMERITUS**

Fred R. von der Mehden

### **ASSOCIATE PROFESSORS**

William Parsons

Nanxiu Qian

### **ASSISTANT PROFESSORS**

Lisa Balabanlilar

David Cook

Shih-Shan Susan Huang

Elora Shehabuddin

Kerry Ward

### **DISTINGUISHED LECTURER EMERITUS**

Thomas McEvilley

### **SENIOR LECTURERS**

Lilly C. H. Chen

Jonathan Ludwig

Hiroko Sato

Guatami Shah

### **LECTURERS**

J. Won Han

Chao-Mei Shen

Peiting Tsai

Meng Yeh

### **DEGREE OFFERED: BA**

Asian Studies is an interdisciplinary major that explores the complex interaction between political, social, religious, and other important spheres of human life in Asia. Emphasis is placed not only on the diversity and achievements of Asian civilizations but also on the ways an understanding of Asia may shed new light on Western cultural traditions. The major is built around courses in the humanities and social science divisions and a team-taught interdisciplinary core course, Introduction to Asian Civilizations. Some residential college courses may qualify for Asian studies credit.

Requirements: The undergraduate Asian Studies major will consist of 30 hours or more of course work. All majors must take the core course, ASIA 211, and 9 additional courses drawn from at least 3 of the departments offering courses in Asian studies. (See specific guidelines below.)

### **DEGREE REQUIREMENTS FOR BA IN ASIAN STUDIES**

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in Asian studies must complete 30 semester hours or more of major course work, including:

- ASIA 211 Introduction to Asian Civilizations
- 9 additional courses drawn from at least 3 of the departments or programs that offer courses with predominantly Asian content. In the case of cross-listed courses, any 1 of the departments or programs appearing in the cross-listing can be used to satisfy this particular requirement. See courses listed below.
- 6 courses at the 300-level or above
- 2 years of a single Asian language (this may include an Asian language other than those offered by Rice), though students may count no more than 4 semesters of Asian languages toward the major. Students who have

placed into the 3rd year (300-level) or higher of an Asian language at Rice will have satisfied our proficiency requirement for the Asian Studies major. Such students may continue with the same Asian language or another and receive up to 4 semesters of credit toward the major for this additional language coursework.

Any changes in the requirements for the major must be approved by the director of Asian Studies.

One or more independent reading courses (ASIA 401 for the fall and ASIA 402 or ASIA 403 for the spring) taught by Asian Studies faculty in these departments may be counted toward the major. Students also may use certain residential college courses to fulfill their major requirements, subject to the approval of the director of Asian studies.

The following courses, not all of which are taught every year, may be used to satisfy the major requirements. Note that a number of these courses are cross-listed.

### ***Anthropology***

ANTH 353 *Cultures of India*

### ***Asian Studies***

ASIA 139 *Introduction to Indian Religions*  
(also offered as RELI 139)

ASIA 140 *Introduction to Chinese Religions*  
(also offered as RELI 140)

ASIA 179 *The Arts of China*

ASIA 211 *Introduction to Asian Civilizations*  
(Also listed as HIST 206)

ASIA 221 *The Life of the Prophet Mubammad*  
(also offered as RELI 221)

ASIA 231 *The Enlightenment of the Body*  
(also offered as RELI 231)

ASIA 232 *Religions From India* (also offered as RELI 232)

ASIA 240 *Gender and Politicized Religion* (also offered as SWGS 240)

ASIA 250 *Meditation, Mysticism, and Magic*  
(also offered as RELI 250)

ASIA 280 *The Asian American Experience*

ASIA 299 *Women in Chinese Literature*  
(also offered as CHIN 299 and SWGS 299)

ASIA 323 *The Knowing Body* (also offered as SWGS 323 and RELI 323)

ASIA 330 *Introduction to Traditional Chinese Poetry* (also offered as CHIN 330)

ASIA 331 *South Asian Literature, Poetry, and Popular Culture I* (also offered as HIND 335)

ASIA 332 *Chinese Literature and its Movie Adaptations* (also offered as CHIN 332)

ASIA 334 *Traditional Chinese Tales* (also offered as CHIN 334)

ASIA 335 *Introduction to Classical Chinese Literature* (also offered as CHIN 335)

ASIA 336 *South Asian Literature, Poetry, and Popular Culture II* (also offered as HIND 336)

ASIA 340 *Gender and Politicized Religion* (also offered as SWGS 340)

ASIA 344 *Korean Literature* (also offered as HUMA 344 and KORE 344)

ASIA 345 *Origin and Development of Korean and Related Languages in East Asia* (also offered as HUMA 345 and KORE 345)

ASIA 346 *Korean Culture and History*  
(also offered as KORE 346)

ASIA 350 *History and Politics of Central Asia*

ASIA 354 *Asian Apocalyptic Movements*  
(also offered as RELI 354)

ASIA 355 *Religion and Social Change in South Asia* (also offered as RELI 355)

ASIA 360 *China and the Chinese Diaspora*

ASIA 361 *The Oriental Renaissance*  
(also offered as RELI 361)

ASIA 363 *Marriage of Heaven and Hell*  
(also offered as RELI 363)

ASIA 372 *Survey of Asian American Literature*  
(also offered as ENGL 372)

ASIA 380 *The Asian American Experience*

ASIA 385 *Chinese Art and Visual Culture* (also offered as HART 372)

ASIA 389 *The Indian Ocean World* (also offered as HIST 389)

ASIA 399 *Women in Chinese Literature*  
(also offered as MDST 379 and SWGS 399)

ASIA 401/402 *Independent Reading*

ASIA 422 *Original Beauty of Chinese Literature*

ASIA 432 *Islam in South Asia* (also offered as HIST 432 and SWGS 432)

ASIA 441 *Popular Religion in the Middle East* (also offered as RELI 441/525)

ASIA 470 *Visual Culture in Revolutionary and Postrevolutionary China (ca. 1949-present)* (also offered as HART 470)

ASIA 473 *Topics in Asian American Literature* (also offered as ENGL 473)

### **Chinese**

CHIN 101/102 *Introductory Chinese I and II*

CHIN 201/202 *Elementary Chinese I and II*

CHIN 203/204 *Accelerated Chinese I and II*

CHIN 211/212 *Accelerated Elementary Chinese I and II*

CHIN 215 *Classical Chinese*

CHIN 301/302 *Intermediate Chinese I and II*

CHIN 311/312 *Accelerated Intermediate Chinese I and II*

CHIN 313 *Advanced Intermediate Chinese: Media Chinese*

CHIN 314 *Contemporary China*

CHIN 315 *Taiwan's Films Since 1980s*

CHIN 316 *Texts from Popular Culture*

CHIN 318 *Medical Chinese*

CHIN 321 *Structure of Chinese: Syntax and Semantics* (also offered as LING 321)

CHIN 322 *Taiwanese Language and Literature*

CHIN 330 *Introduction to Traditional Chinese Poetry* (also offered as ASIA 330)

CHIN 332 *Chinese Literature and its Movie Adaptations* (also offered as ASIA 332)

CHIN 334 *Traditional Chinese Tales* (also offered as ASIA 334)

CHIN 335 *Introduction to Classical Chinese Literature* (also offered as ASIA 334)

CHIN 346 *History of the Chinese Language* (also offered as LING 346)

CHIN 399 *Chinese Teaching Practicum*

CHIN 411/412 *Advanced Chinese Language and Culture I and II*

CHIN 422 *Original Beauty of Chinese Literature* (also offered as ASIA 422)

### **English**

ENGL 372 *Survey of Asian American Literature* (also offered as ASIA 372)

ENGL 473 *Topics in Asian American Literature* (also offered as ASIA 473)

### **Hindi**

HIND 101/102 *Elementary Hindi I and II*

HIND 201/202 *Intermediate Hindi I and II*

HIND 335 *South Asian Literature, Poetry, and Popular Culture I* (also offered as ASIA 331)

HIND 336 *South Asian Literature, Poetry, and Popular Culture II* (also offered as ASIA 336)

HIND 398/399 *Hindi Teaching Practicum*

### **History**

HIST 134 *20th-Century Chinese Women*

HIST 206 *Introduction to Asian Civilizations*

HIST 219 *Fortune-Tellers and Philosophers*

HIST 220 *Contemporary China* (also offered as ANTH 220)

HIST 268 *Bondage in the Modern World*

HIST 270 *South Africa and Indonesia*

HIST 271 *History of South Asia to 1857*

HIST 272 *Modern South Asia*

HIST 302 *Traditional Chinese Culture*

HIST 310 *Contemporary China* (enriched version of HIST 220; also offered as ANTH 310)

HIST 319 *Fortune-Tellers and Philosophers*

HIST 320 *Imperial Gardens*

HIST 341 *Premodern China*

HIST 342 *Modern China*

HIST 389 *The Indian Ocean World* (also offered as ASIA 389)

HIST 405 *Issues in Comparative History*

HIST 432 *Islam in South Asia* (also offered as ASIA 432 and WGST 432)

HIST 450 *Traditional Chinese Culture* (enriched version of HIST 250)

HIST 493 *Early Modern Islamic Empires*

### **History of Art**

HART 170 *The Arts of China*

HART 372 *Chinese Art and Visual Culture* (also offered as ASIA 385)

HART 470 *Visual Culture in Revolutionary and Postrevolutionary China (ca. 1949-present)* (also offered as ASIA 470)

### **Japanese**

JAPA 101/102 *Introduction to Japanese I and II*

- JAPA 201/202 *Intermediate Japanese I and II*  
 JAPA 301/302 *Advanced Japanese Reading and Composition I and II*  
 JAPA 370 *Structure of Japanese* (also offered as LING 370)  
 JAPA 398/399 *Japanese Teaching Practicum*  
 JAPA 498/499 *Independent Study*

### **Korean**

- KORE 101/102 *Introduction to Korean Language and Culture I and II*  
 KORE 201/202 *Intermediate Korean Language and Culture I and II*  
 KORE 301/302 *Advanced Korean I and II*  
 KORE 344 *Korean Literature and Culture* (also offered as ASIA 344 and HUMA 344)  
 KORE 345 *Origin and Development of Korean and Related Languages in East Asia* (also offered as LING 345 and ASIA 345)  
 KORE 346 *Korean Culture and History* (also offered as ASIA 346)  
 KORE 398/399 *Korean Teaching Practicum*

### **Linguistics**

- LING 321 *Structure of Chinese Syntax and Semantics* (also offered as CHIN 321)  
 LING 345 *Linguistic Structure of Korean* (also offered as ASIA 345 and KORE 345)  
 LING 370 *Structure of Japanese* (also offered as JAPA 370)

### **Political Science**

- POLI 250 *Political Economy of Gender* (also offered as SWGS 250)  
 POLI 460 *Seminar in Comparative Government*

### **Religious Studies**

- RELI 132/133 *and Colloquial Tibetan* (also offered as TIBT 132)  
 RELI 221 *The Life of the Prophet Muhammad* (also offered as ASIA 221)  
 RELI 231 *The Enlightenment of the Body* (also offered as ASIA 231)  
 RELI 232 *Religions From India* (also offered as ASIA 232)  
 RELI 250 *Meditation, Mysticism, and Magic* (also offered as ASIA 250)

- RELI 322 *Introduction to Buddhism*  
 RELI 323 *The Knowing Body* (also offered as ASIA 323 and SWGS 323)  
 RELI 325 *Buddhism and the Female*  
 RELI 328 *Tantra in Comparative Perspective*  
 RELI 331/332 *Advanced Tibetan Language and Culture I and II* (also offered as TIBT 331/332)  
 RELI 354 *Asian Apocalyptic Movements* (also offered as ASIA 354)  
 RELI 355 *Religion and Social Change in South Asia* (also offered as ASIA 355)  
 RELI 356 *Major Issues in Contemporary Islam*  
 RELI 361 *The Oriental Renaissance* (also offered as ASIA 361)  
 RELI 363 *The Marriage of Heaven and Hell* (also offered as ASIA 363)  
 RELI 441/525 *Popular Religion in the Middle East* (also offered as ASIA 441)  
 RELI 470 *Buddhist Wisdom Texts*  
 RELI 480/580 *Sexuality, Sanctity, and Psychoanalysis* (also offered as SWGS 470)

### **Sociology**

- SOCI 323 *The Knowing Body: Buddhism, Gender, and the Social World* (also offered as ASIA 323 and SWGS 323)

### **Tibetan**

- TIBT 132/133 *Tibetan Language and Culture I and II* (also offered as RELI 132/133)  
 TIBT 331/332 *Advanced Tibetan Language and Culture I and II* (also offered as RELI 331/332)

### **University and Residential College Courses**

- RICH 280 *Clothing and Culture: Kimono as a Reflection of Modern Japanese History*  
**Women, Gender, and Sexuality Studies**  
 SWGS 240 *Gender and Politicized Religion* (also offered as ASIA 240)  
 SWGS 250 *Political Economy of Gender* (also offered as ASIA 250)  
 SWGS 299 *Women in Chinese Literature* (also offered as ASIA 299 and CHIN 299)  
 SWGS 323 *The Knowing Body: Buddhism, Gender, and the Social World* (also offered as ASIA 323 and SOCI 323)

SWGS 340 *Gender and Politicized Religion*  
(also offered as ASIA 240)

SWGS 399 *Women in Chinese Literature*  
(also offered as ASIA 399 and CHIN 399)

SWGS 432 *Islam in South Asia*  
(also offered as ASIA 432 and HIST 432)

SWGS 470 *Sexuality, Sanctity, and  
Psychoanalysis* (also offered as RELI 480/580)

**See ASIA in the Courses of Instruction section.**

# BIOENGINEERING

## GEORGE R. BROWN SCHOOL OF ENGINEERING

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John Oghalai

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### ADJUNCT LECTURERS

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Kathryn Peek

## DEGREES OFFERED: BSB, MBE, MS, PHD

Graduate programs in bioengineering offer concentrations in areas such as biomedical imaging and diagnostics, cellular and biomolecular engineering,

computational and theoretical bioengineering, drug delivery and biomaterials, supramolecular biophysics and bioengineering, and tissue engineering and biomechanics. Undergraduate programs in bioengineering offer concentrations in areas that include cellular and molecular engineering; bioinstrumentation, imaging, and optics; and biomaterials and biomechanics. Research areas include biomechanical engineering, biological systems modeling, bioinformatics, biomaterials, biomedical lasers, cellular and molecular engineering, controlled release technologies, metabolic engineering, spectroscopy, statistical mechanics, systems engineering and instrumentation, thrombosis, tissue engineering, and transport processes.

**Undergraduate Program**—The bioengineering undergraduate program will prepare students for careers in rapidly developing areas of biomedical engineering and bioprocessing. Our unified and comprehensive program leading to the BS degree in bioengineering will:

- Provide students with a fundamental understanding of mathematics and the natural, life, and medical sciences
- Teach students bioengineering principles and their applications in life and medical sciences
- Develop critical problem-solving skills in bioengineering
- Develop the ability to communicate effectively and participate in interdisciplinary teams
- Expose students to a broad education that prepares them for diverse careers

Undergraduates in bioengineering will have the training to pursue further education in graduate school or medical school and will have strong preparation for a career in the biotechnology industry.

The BSB degree is organized around a core of required courses and a selection of elective courses from 3 areas of specialization. The specialization electives provide a flexibility that can be used to create a focus in cellular and molecular engineering; bioinstrumentation, imaging, and optics; or biomaterials and biomechanics. Because of the number of options, students should consult early with departmental advisors to plan a program that meets their needs.

### DEGREE REQUIREMENTS FOR BS IN BIOENGINEERING

For general university requirements, see Graduation Requirements (pages 14–15). The curriculum for a BS degree in bioengineering requires 94 credit hours, which count toward the total of 134 hours required to graduate.

**Preparation**—As freshmen, students considering a major in bioengineering should take MATH 101 and 102, CHEM 121 and 122, PHYS 101 or PHYS 125, PHYS 102 or PHYS 126, and CAAM 210. Sophomore students should take MATH 211 and 212, CHEM 211, BIOS 201, ELEC 243 and MECH 211. BIOE 252 should be taken in the 1st semester of the sophomore year. BIOE 330, BIOE 320, and BIOE 322 should be taken the 2nd semester of the sophomore year.

Students majoring in bioengineering must complete the following courses.

#### *Core Courses*

#### *Bioengineering*

BIOE 252 *Bioengineering Fundamentals*

BIOE 320 *Systems Physiology  
Laboratory Module*

BIOE 322 *Systems Physiology*

BIOE 330 *Bioreaction Engineering*



BIOE 332 *Thermodynamics*  
 BIOE 342 *Tissue Culture Laboratory*  
 BIOE 370 *Biomaterials*  
 BIOE 372 *Biomechanics*  
 BIOE 383 *Biomedical Instrumentation*  
 BIOE 385 *Biomedical Instrumentation Laboratory*  
 BIOE 391 *Numerical Methods*  
 BIOE 420 *Biosystems Transport and Reaction Processes*  
 BIOE 440 *Statistics for Bioengineers*  
 BIOE 442\* *Tissue Engineering Laboratory Module*  
 BIOE 443\* *Bioprocessing Laboratory Module*  
 BIOE 444\* *Biomechanical Testing Laboratory Module*  
 BIOE 445\* *Advanced Bioinstrumentation Laboratory Module*  
 BIOE 451 *Bioengineering Design I*  
 BIOE 452 *Bioengineering Design II*

**Biosciences**

BIOS 201 *Introductory Biology*  
 BIOS 341 *Cell Biology*

### **Computational and Applied Mathematics**

CAAM 210 *Introduction to Engineering Computation*

### **Chemistry**

CHEM 121 *General Chemistry*  
 CHEM 122 *General Chemistry*  
 CHEM 211 *Organic Chemistry*

### **Math**

MATH 101 *Single Variable Calculus I*  
 MATH 102 *Single Variable Calculus II*  
 MATH 211 *ODEs and Linear Algebra*  
 MATH 212 *Multivariable Calculus*

### **Electrical Engineering**

ELEC 243 *Introduction to Electronics*

### **Mechanical Engineering**

MECH 211 *Engineering Mechanics*

### **Physics**

PHYS 101, PHYS 111, or PHYS 125 *Mechanics*  
 PHYS 102, PHYS 112, or PHYS 126 *Electricity and Magnetism*

\*Students must take advanced laboratory module in their specialization area: BIOE 442 or BIOE 443 for cellular and molecular engineering; BIOE 442 or 444 for biomaterials and biomechanics; and BIOE 445 for bioinstrumentation, imaging and optics. Students must take one other advanced laboratory module for a total of 2 of the 4 listed modules (BIOE 442, 443, 444, and 445).

## **SPECIALIZATION AREAS**

Three specialization area elective courses, at least 2 of which must be at the senior level, will be required in 1 of the 3 areas:

- Cellular and molecular engineering
- Bioinstrumentation, imaging, and optics
- Biomaterials and biomechanics

The elective courses in these concentration areas will be announced in future course listings. All 3 specialization courses must be engineering courses.

**Graduate Program**—To train the next generation of leaders in bioengineering, we have built an innovative teaching program that transcends boundaries between bioengineering, basic science, and clinical medicine, integrating the academic, industrial, and societal perspectives.

Our hands-on approach to education is supported by a long standing tradition of cross-disciplinary research and education. The Rice bioengineering program is a comprehensive training program that provides student with:

- A fundamental understanding of the life and medical sciences

- Advanced analytical and engineering capabilities,
- Translational research that transfers biotechnical advances from bench to bedside

With this educational background, graduates will be well prepared to participate in independent or collaborative research and development endeavors in industry or academia.

### DEGREE REQUIREMENTS FOR MBE AND MS AND PHD IN BIOENGINEERING

For general university requirements, see Graduate Degrees (pages 57–58).

To make sure scores are available when admission decisions are made, applicants need to register to take the GRE and TOEFL as required before September for the year in which they are applying. Applicants should request transcripts and letters of recommendation before September, as well, to give senders time to get the material to Rice University by the December 31 deadline. The Graduate Admissions Committee begins its deliberations in late November. Application materials received after the December 31 deadline will not be considered. Once admitted, departmental policy requires full-time students to be registered for at least 12 credit hours each semester.

**MBE Program**—The master of bioengineering degree is intended for those having a BA or BS degree in an engineering or science discipline.

Candidates for the MBE degree must complete the following course work:

1. Curriculum must be approved by the Graduate Academic Affairs Committee of the bioengineering department. (This will be done on a case-by-case basis).
2. Total of 30 credit hours is required (courses must be above and beyond the requirement for the undergraduate degree) as follows:
  - At least 15 credit hours of the 30 must be taken as BIOE courses, including Fundamentals of Systems Physiology (BIOE 572)
  - Introduction to Partial Differential Equations (MATH 381) (3 hours)
  - 1 additional engineering course (3 hours)
  - 3 additional courses approved by the Graduate Academic Affairs Committee (9 hours)

In summary, the credit hours required are:

- 15 credit hours of BIOE courses
- 3 credit hours of MATH 381
- 3 credit hours of one additional engineering course
- 9 credit hours of additional courses approved by the Graduate Academic Affairs Committee
- 30 Total credit hours

**MS Program**—Candidates for the MS degree must:

- Complete at least 18 approved semester hours of foundation, supporting, and advanced courses while maintaining a grade point average of 3.0
- MS students must earn additional credits they need for graduation by registering for the master's research course BIOE 600 during the terms they are engaged in research.
- Fulfill a teaching requirement

- Submit an original research thesis
- Defend the thesis in a public oral examination

**PhD Program**—Candidates for the PhD degree must:

- Complete at least 30 approved semester hours of foundation, supporting, and advanced courses with high standing. With departmental approval, the course requirements may be reduced to not less than 22 hours for students already holding an MS degree.
- Fulfill a teaching requirement. After their 1st semester in residence, students may be asked to spend the equivalent of 6 to 10 hours per week for a total of 3 semesters on teaching assignments.
- Submit a thesis proposal. PhD students must submit and successfully defend their thesis proposals by the end of their 4th semester in residence.
- Complete a 3- to 6-month internship. This requirement may be waived for those with adequate previous relevant experience.
- Submit a thesis that provides evidence of their ability to carry out original research in a specialized area of bioengineering.
- Defend the thesis in a public oral examination.

Graduate students take required courses and electives in the following areas:

- Molecular, cellular, and tissue engineering
- Imaging and optics
- Biomaterials, biomechanics, and tissue engineering
- Computational bioengineering

See **BIOE** in the **Courses of Instruction** section.

# BIOSCIENCES

## BIOCHEMISTRY AND CELL BIOLOGY

### THE WIESS SCHOOL OF NATURAL SCIENCES

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Paolo Moretti

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Neal Pellis

George N. Phillips Jr

Florante A. Quioccho

Clarence Sams

Scott Singleton

Ah-Lim Tsai

Peggy Whitson

## ECOLOGY AND EVOLUTIONARY BIOLOGY

### THE WIESS SCHOOL OF NATURAL SCIENCES

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Blaine Cole

Jeff Glassberg  
Dan Graur  
Nancy Greig  
Adam Kuspa  
Wen-Hsiung Li  
Steve Pennings  
Gad Shaulsky  
Diane Wiernasz

**DEGREES OFFERED: BA, BS, MA, PHD**

**Undergraduate Programs**—The Departments of Biochemistry and Cell Biology and Ecology and Evolutionary Biology offer a broad range of courses in the biosciences: animal behavior, animal biology, biochemistry, biophysics, cell biology, developmental biology, ecology, endocrinology, evolutionary biology, genetics, immunology, microbiology, molecular biology, neurobiology, plant biology, and advanced courses in these and related areas. Students may elect a BA in Biochemistry and Cell Biology, BA in Biological Sciences, BS in Biochemistry and Cell Biology, or BS in Ecology and Evolutionary Biology. They also may select courses from the range of topics listed above.

**Core courses required of all bioscience majors:****Mathematics**

MATH 101/102 *Single Variable Calculus I and II*

**Chemistry**

CHEM 121/122 *General Chemistry with Laboratory*

CHEM 211/212 *Organic Chemistry*

CHEM 215 *Organic Chemistry Lab*

**Physics**

PHYS 125/126 *General Physics I and II*

**Biosciences**

BIOS 201/202 *Introductory Biology*

BIOS 301 *Biochemistry*

BIOS 211 *Introductory Lab in Biological Sciences* (2 credit hours)

BIOS 213 *Introductory Lab in Ecology and Evolutionary Biology*

**1 Group B BIOS course****2 of the following advanced laboratory courses:**

BIOS 311 *Lab in Protein Purification*

BIOS 312 *Lab Module in Molecular Biology I*

BIOS 313 *Lab Module in Molecular Biology II*

BIOS 314 *Lab in Cell and Developmental Biology*

BIOS 315 *Lab in Physiology*

BIOS 316 *Lab in Ecology*

BIOS 317 *Lab in Behavior*

BIOS 318 *Lab in Microbiology*

BIOS 320/BIOE 342 *Lab in Tissue Culture*

BIOS 327 *Biological Diversity Lab*

BIOS 330 *Insect Biology Lab*

BIOS 337 *Field Bird Biology Lab*

BIOS 393 *Laboratory Transfer Credit in Biosciences*

BIOS 530 *NMR Spectroscopy and Molecular Modeling*

BIOS 532 *Spectroscopy*

BIOS 533 *Computational Biology*

BIOS 535 *Practical X-Ray Crystallography*

MATH 111 and 112 may be substituted for MATH 101; CHEM 151 and 152 may be substituted for CHEM 121 and 122; PHYS 101 and 102 or PHYS 111 and 112 and their labs may be substituted for PHYS 125 and 126. See listings in the Courses of Instruction for Group A and B designations. No course may be counted more than once toward any of the major requirements.

One of the advanced laboratory course requirements can be satisfied by taking any of the following: (i) BIOS 310 or BIOS 306 if taken for at least two credits; or (ii) HONS 470/471, if the research supervisor is from one of the biosciences departments or if the research is biological in nature and preapproved by the student's advisor; (iii) BIOS 412; or (iv) BIOS 393.

### **BA IN BIOCHEMISTRY AND CELL BIOLOGY**

In addition to the core courses required of all biosciences majors, BA majors within this option also must take:

- MATH 211 or MATH 213
- BIOS 311
- BIOS 341
- 2 of the following courses: BIOS 302, BIOS 344, BIOS 352
- 2 additional Group A biosciences courses, only one of which may be BIOS 401 or 402

CHEM 311/312 may be substituted for BIOS 352. NEUR 511/512 may be substituted for 1 Group A course. Students may receive credit toward the major for a maximum of 3 credits of BIOS 390.

### **BA IN BIOLOGICAL SCIENCES**

In addition to the core courses that are required of all biosciences majors, BA majors within this option must take:

- MATH 211, MATH 213, STAT 305, or BIOS 338
- 1 of the following advanced lab courses: BIOS 311, 312, 313, 314, 315, 316, 317, 318, 320 (BIOE 342), 327, 330, 337, 393, 530, 533, or 535
- 1 of the following Group A courses: BIOS 302, 341, 344, 352
- 1 additional Group A course
- 2 Group B courses
- 1 additional Group A or Group B course

Only 1 of the courses used to satisfy these Group A and Group B requirements may be BIOS 401, 402, 403, or 404. NEUR 511/512 may be substituted for 1 Group A course. CHEM 311/312 may be substituted for BIOS 352. Students may receive credit toward the major for a maximum of 3 credits of BIOS 390 and 3 credits of BIOS 391. Students desiring to specialize in ecology and evolutionary biology can choose a Group B course for the Group A or B course and their advanced lab can be BIOS 316, 317, 327, 330, 337, or 393.

### **BS IN BIOCHEMISTRY AND CELL BIOLOGY**

In addition to the core courses required of all biosciences majors, BS majors must also take:

- MATH 211 or MATH 213
- BIOS 311
- BIOS 302
- BIOS 341
- BIOS 344
- BIOS 352 or CHEM 312/313
- Three additional Group A bioscience courses

BIOS 401/402 are recommended Group A courses in the BS degree program. NEUR 511/512 may be substituted for one Group A course. Students may receive credit toward the major for a maximum of 3 credits of BIOS 390.

### **BS IN ECOLOGY AND EVOLUTIONARY BIOLOGY**

In addition to the core courses required of all biosciences majors, BS majors must also take:

- MATH 211, MATH 213, STAT 305, or BIOS 338
- 1 of the following advanced laboratory courses: BIOS 316, 317, 327, 330, 337, 393
- 1 Group A biosciences course
- BIOS 403 and BIOS 404
- 2 additional Group B biosciences courses
- 1 additional biosciences course from Group A or B

NEUR 511 and 512 may be substituted for 1 Group A course. Students may receive credit toward the major for a maximum of 3 credits of BIOS 390 and 3 credits of BIOS 391.

**Advising**—Students should contact the appropriate departmental office to be assigned to an advisor. Those pursuing a BS or BA in Biochemistry and Cell Biology should contact that department office. Those pursuing a BS in Ecology and Evolutionary Biology should contact that department office. Those electing a BA in Biological Sciences may choose the department that most closely corresponds to their interests, and that choice may be changed at any time. Students interested in environmental careers should consult with the ecology and evolutionary biology department for a list of recommended courses. See also Environmental Studies listings and Environmental Science Double Major.

It is recommended that the 100-level mathematics and chemistry courses be taken in the freshman year; that the 100-level physics courses and the 200-level biosciences courses be taken in either the freshman or sophomore year; and that CHEM 211, 212, 215 be taken in the sophomore year. Those with a limited background in chemistry should complete CHEM 121, 122 before taking BIOS 201, 202. Others are urged to take BIOS 201, 202 as freshmen to permit earlier access to advanced level BIOS courses. PHYS 125 and 126 are the preferred physics courses for biosciences majors. However, PHYS 101 and 102 or PHYS 111 and 112 and their labs may be taken instead by those wishing to preserve the option of majoring in a subject for which PHYS 101 and 102 are required.

Note that BIOS 311 is a prerequisite for BIOS 312, 313, 314, 315, and 318. This prerequisite will be strictly enforced, and majors in Biological Sciences whose interests are primarily in cell and molecular biology, are advised to take BIOS 311 as early as possible to allow for scheduling subsequent lab modules.

An undergraduate major in biosciences must have 48 semester hours in courses numbered 300 or higher to obtain a BA or BS degree. Students also must complete no fewer than 60 semester hours outside the departmental requirements. These must include the courses needed to satisfy the university distribution requirements.

### ACCELERATED RICE BA-BS/PHD PROGRAM IN BIOCHEMISTRY AND CELL BIOLOGY

Qualified undergraduate students at Rice can apply to enroll in the biochemistry and cell biology graduate program in their senior year. The course requirements for graduate studies are therefore completed at the same time as the upper-level undergraduate degree requirements; laboratory research performed as part of the undergraduate thesis project can serve as the initial phases of the PhD thesis work. As a result, the graduate careers of these students will be accelerated by at least 1 full year, and, in principle, such students should be able to obtain their PhD degrees approximately 3 years after obtaining their BA or BS degree.

Criteria for selection include academic performance (GPA  $\geq 3.3$ ), GRE scores, motivation, previous research experience, and personal qualities. Selection is made by the department admissions committee.

### MECHANICS OF THE PROGRAM

The program requires the completion of 2 and 1-half years (or their equivalent) of undergraduate studies at Rice before a student can be considered for enrollment in the accelerated PhD program. To continue in the program, the following requirements must be fulfilled: (1) The student must take the GRE before receiving the BA or BS degree and receive scores greater than 80 percent in the Analytical and Quantitative Tests; (2) students also must maintain at least a B average in all courses in their senior year; and (3) the usual graduate requirements will apply for continuation in the program.

### DEGREE REQUIREMENTS FOR MA AND PHD IN BIOCHEMISTRY AND CELL BIOLOGY

**Admission**—Applicants for graduate study in the Department of Biochemistry and Cell Biology must have:

- BA or BS degree in biochemistry, biology, chemistry, chemical engineering, physics, or some equivalent
- Strong ability and motivation, as indicated by academic record, Graduate Record Examination (GRE) scores, and recommendations

Although the department offers an MA degree in biochemistry and cell biology, only on rare occasions are students who do not intend to pursue the PhD degree admitted to the graduate program. The department provides a program guide entitled "Graduate Requirements for Biochemistry and Cell Biology" which is updated annually. For general university requirements, see Graduate Degrees (in the *General Announcements*).

**Both PhD and MA Programs**—Most of the formal course studies will be completed in the 1st year of residence to allow the students to commence thesis research at the end of their 2nd semester at Rice. During the 1st year, all graduate students will be advised by the Graduate Advisory Committee. This committee will determine the formal course program to be taken during the 1st year in residence. Students are required to have training in biochemistry, cell biology, genetics, and physical chemistry or biophysics. If students are missing formal training in these subjects, they are required to take the equivalent background courses during their 1st year. The corresponding courses at Rice include the following:



BIOS 301 *Biochemistry*  
 BIOS 341 *Cell Biology*  
 BIOS 344 *Molecular Biology and Genetics*  
 BIOS 352 *Physical Chemistry for  
 the Biosciences*

**All PhD students are required to take the following graduate-level courses:**

BIOS 575 *Introduction to Research*  
 BIOS 581, 582 *Graduate Research Seminars*  
 BIOS 583 *Molecular Interactions*  
 BIOS 587 *Research Design, Proposal Writing,  
 and Professional Development*  
 BIOS 594 *Responsible Conduct of Research*  
 BIOS 599 *Graduate Teaching*  
 BIOS 701/702 *Graduate Lab Research*  
 (rotations in 1st year)

**Students must also take 2 units from the following set of advanced courses:**

BIOS 525 *Plant Molecular Biology* (1 unit)  
 BIOS 530, 532, 533, 535 *Graduate Laboratory  
 Modules in Molecular Biophysics*  
 (1/2 unit each)  
 BIOS 544 *Developmental Biology* (1 unit)  
 BIOS 545 *Advanced Molecular Biology and  
 Genetics* (1 unit)  
 BIOS 551 *Molecular Biophysics* (1 unit)  
 BIOS 552 *Molecular Biophysics II* (1 unit)  
 BIOS 588 *Advanced Cell and Developmental  
 Biology* (1 unit)

Students should complete BIOS 583 and BIOS 587 in their 1st year, and they will be responsible for the content of those course programs in their admission to candidacy examinations (see below). Students also gain teaching experience by serving as discussion leaders and graders in undergraduate sections during their 2nd year. Safety and ethics presentations are provided for 1st-year students.

**Evaluation of Progress in Graduate Study**—The Graduate Advisory Committee evaluates each student's undergraduate record and identifies any deficiencies to be corrected (usually in the 1st year). Thesis advisors may require additional course work of a more specialized nature. Students must complete all additional courses before taking the admission to candidacy examination.

At the end of each semester, the department chair, in consultation with the committee and faculty, reviews student performance in the formal course work; after students complete 2 semesters at Rice, the faculty conducts a review. Students must maintain at least a B average and demonstrate outstanding motivation and potential for research.

Evaluation after the 1st year includes:

- Ongoing review of research progress by the thesis research advisor
- A research progress review examination given each year by the student's Research Progress Review Committee
- Presentation of research progress at least once a year after the 1st year until submission of a complete doctoral thesis
- Completion of an oral admission to candidacy examination before the end of the student's fourth semester
- Defense of the PhD thesis research and text in a final public seminar presentation and oral examination attended by the student's thesis committee

**MA Program**—All the above requirements and evaluation procedures apply to MA candidates with the following exceptions. The research progress review examination held during the MA student's second full year, which is identical in format to that for PhD students, replaces the admission to candidacy examination; no other preliminary examination is held before the final oral defense of the master's thesis. MA candidates must complete a thesis and

make a public oral defense of their research work to their thesis committee and other interested parties.

## DEGREE REQUIREMENTS FOR MS, MA, AND PHD IN ECOLOGY AND EVOLUTIONARY BIOLOGY

**Admission**—Applicants for graduate study in the Department of Ecology and Evolutionary Biology must have:

- BA or BS degree or equivalent that provides a strong background in biology
- Strong ability and motivation, as indicated by academic record, Graduate Record Examination (GRE) scores, and recommendations
- Scores from the GRE Biology subject exam are optional but can be helpful, particularly for student with nontraditional backgrounds in biology

These requirements do not preclude admission of qualified applicants who have majored in areas other than biology. Although the department offers MA and MS degrees, only on rare occasions are students who do not intend to pursue the PhD admitted to the graduate program.

Students should have completed course work in physics, mathematics (including calculus), and chemistry (including organic chemistry) prior to admission. Deficiencies in these subject areas or in specific areas of biology should be made up during the first year of residence; some may be waived at the discretion of the student's advisory committee and the department chair.

Entering students will meet with a faculty advisor to form a course of study of the first year. All first year students will complete the core course in ecology and evolutionary biology (BIOS 569) in their first semester. All graduate students are required to complete BIOS 585/586 (Graduate Seminar in Ecology and Evolutionary Biology) and two semesters of BIOS 591 (Graduate Teaching). Students must maintain a grade average of B in courses taken in the department and satisfactory grades in courses taken outside the department.

Students must demonstrate satisfactory progress in their degree program in annual reviews by a departmental committee. The review process requires that each student present a public seminar on their research, prepare a written report on their progress, and participate in an interview with the departmental committee. For general university requirements, see Graduate Degrees (in *General Announcements*).

**MS Program.** In addition to the general university requirements and those listed above, the master of science in ecology and evolutionary biology requires at least 10 hours of research credit.

**MA Program.** In addition to the general university requirements and those listed above, the master of arts in ecology and evolutionary biology requires the completion and public defense of a thesis embodying the results of an original investigation.

**PhD Program.** In addition to the general university requirements and those listed above, the PhD degree in ecology and evolutionary biology requires:

- Passing the admission to candidacy examination given by the Graduate Thesis Committee. (Committee will be composed of at least 4 members. At least 3 must be members of the EEB graduate faculty.)
- Complete an original investigation and a doctoral thesis with the potential to produce publications in reputable, peer-reviewed scientific journals
- Present a departmental seminar on the research
- Publicly defend the doctoral thesis

# CENTER FOR THE STUDY OF LANGUAGES

## THE SCHOOL OF HUMANITIES

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Deborah Nelson-Campbell

### ASSOCIATE DIRECTOR

Claire Bartlett

### DIRECTOR OF LANGUAGE

### RESOURCE CENTER

Claire Bartlett

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Lilly C. Chen (*Chinese*)

Brigitte Crull (*French*)

Evelyne Datta (*French*)

Raquel Gaytán (*Spanish*)

Jonathan Ludwig (*Russian*)

Jose Narbona (*Spanish*)

Marcela Salas (*Spanish*)

Hiroko Sato (*Japanese*)

Gautami Shah (*Hindi*)

Chao-Mei Shen (*Chinese*)

Richard Spuler (*German*)

Jane Verm (*Spanish*)

### LECTURERS

Edward Anderson (*Italian*)

Victoria Arbizu-Sabater (*Spanish*)

Maher Awad (*Arabic*)

Tiqva Baron (*Hebrew*)

Suzana Bloem (*Portuguese*)

Fabiana Cecchini (*Italian*)

Elizabeth Cummins-Muñoz (*Spanish*)

Christa Gaug (*German*)

J. Won Han (*Korean*)

Luisa Kluger (*Spanish*)

Peggy Patterson (*Spanish*)

Pei-Ting Tsai (*Chinese*)

Meng Yeh (*Chinese*)

Elsa Zambosco-Thomas (*Spanish*)

The Center for the Study of Languages (CSL) was founded in 1997 to promote and enhance the study of languages at Rice University and is responsible for teaching 12 languages through the 3rd year of instruction. The role of the center is to establish innovative approaches to language acquisition, expand opportunities for language learning across the curriculum, and increase Rice students' participation in study and work abroad. The Language Resource Center (LRC), the technology division of the CSL, provides resources such as specialized computer software and enhanced videos to support and supplement all aspects of the teaching and learning of languages.

### DEGREES OFFERED: NONE

The CSL does not offer degree programs itself, but students are able to pursue language degrees from language departments. Some of those degrees include: BA in Asian Studies (Asian Studies); BA in Classical Studies (Classical Studies); BA, MA, and PhD in French Studies (French Studies); BA in German Studies; BA in Slavic Studies (German and Slavic Studies); and BA and MA in Spanish (Hispanic Studies). See each department for degree requirements.

### PLACEMENT TESTING

Foreign language classes are popular among Rice University students who wish to enhance their knowledge of world languages and cultures. Students who have some background in the language they intend to study are required to take a placement test to ensure that they are placed in the appropriate course. Placement tests can be taken online prior to matriculation or during O-Week. Additional information regarding language placement tests can be found on the Language Resource Center web page at [www.ruf.rice.edu/~lrc/placement.html](http://www.ruf.rice.edu/~lrc/placement.html).

### **TRANSFER CREDITS**

The CSL will determine equivalency for foreign language classes taken at other colleges or universities and approve them for transfer credit. University transfer credit guidelines (see page 27) as well as requirements of the degree-granting department still apply. Students who study abroad should have their transfer credits approved before they commit to a study-abroad program. When requesting Rice equivalent credit for foreign language acquisition courses students must submit no less than the following to the CSL for approval: 1) the appropriate transfer request form from the Registrar's Office, 2) a program description for courses taken abroad or catalog description for courses taken in the United States, and 3) a syllabus for the course they wish to take or have taken. Students should be aware that the approval process takes about 1 week and should plan accordingly.

### **SCHOLARSHIPS**

Two scholarships are offered yearly through the CSL. The Donne Di Domani donates money to be awarded to outstanding Rice University students. This scholarship, to be used for tuition and books, is awarded to students committed to study of the Italian language and is based on need and merit. The Ministry of Education, Republic of China in Taiwan also offers a scholarship to study Mandarin Chinese in Taiwan. Students interested in applying for either of these scholarships should contact the CSL at the beginning of the spring semester.

**See ARAB, CHIN, FREN, GERM, HIND, HEBR, ITAL, JAPA, KORE, PORT, RUSS, and SPAN in the Courses of Instruction section.**

# CHEMICAL AND BIOMOLECULAR ENGINEERING

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

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Andreas N. Matzakos

## DEGREES OFFERED: BA, BSChE, MChE, MS, PHD

This major gives undergraduates a sound scientific and technical grounding for further development in a variety of professional environments. Courses in mathematics, chemistry, physics, and computational engineering provide the background for the chemical engineering core, which introduces students to chemical process fundamentals, fluid mechanics, heat and mass transfer, thermodynamics, kinetics, reactor design, process control, product and process design. Course electives may be used to create a focus area in one of the following 4 disciplines: biotechnology/bioengineering, environmental engineering, materials science/engineering, and computational engineering. Upon completing either the flexible BA requirements or the more scientific and professional BSChE requirements, students may apply for a 5th year of study leading to the nonthesis Master of Chemical Engineering (MChE) degree. A joint MBA/MChE degree also is available in conjunction with the Jesse H. Jones Graduate School of Management.

Students admitted for graduate studies leading to the MS or PhD degrees must complete a rigorous program combining advanced course work and original research that must be formalized in an approved thesis. Graduate research is possible in a number of areas, including catalysis and nanotechnology, thermodynamics and phase equilibria, interfacial phenomena, colloids, microemulsions, rheology and fluid mechanics, biosystems engineering, biocatalysis and metabolic engineering, cell population heterogeneity and biological pattern formation, cellular and tissue engineering, energy and sustainability, gas hydrates, enhanced oil recovery, reservoir characterization, and pollution control.

**DEGREE REQUIREMENTS FOR BS IN CHEMICAL ENGINEERING**

For general university requirements, see Graduation Requirements (pages 14–15). The BS degree is accredited by the Accreditation Board for Engineering and Technology (ABET). Through careful selection of other engineering and science courses, a student can develop a focus (or concentration) area in any of the following 4 engineering disciplines: environmental biotechnology/engineering, bioengineering, materials science/engineering, and computational engineering. These elective programs can be completed within the framework of a BS in chemical engineering. Students majoring in chemical engineering must complete 96 hours in the courses specified below for a minimum of 132 hours at graduation.

The undergraduate curriculum is designed so that outstanding students interested in careers in research and teaching may enter graduate school after earning either bachelor's degree.

**ENGINEERING BREADTH AND FOCUS AREA OPTIONS**

To complete their technical education, Rice students seeking a BS degree in chemical engineering take course electives in at least 2 other engineering disciplines to satisfy a "breadth" requirement.

Or, they can use their electives to create a focus (or concentration) area in 1 of the following four disciplines:

- biotechnology/bioengineering
- computational engineering
- environmental engineering
- materials science and engineering

Consult our department web page for a detailed list of courses that can be used to satisfy the engineering breadth or focus area requirements.

**DEGREE REQUIREMENTS FOR BSChE IN CHEMICAL ENGINEERING****Chemistry**

CHEM 121/122 *General Chemistry with Laboratory* or

CHEM 151/152 *Honors Chemistry with Laboratory*

CHEM 211/212 *Organic Chemistry*

CHEM 217 *Organic Chemistry Lab*

CHEM 311/312 *Physical Chemistry*

Any 2 of CHEM 212, CHEM 311, or CHEM 312

**Chemical and Biomolecular Engineering**

CHBE 301 *Chemical Engineering Fundamentals*

CHBE 303 *Computer Programming in Chemical Engineering*

CHBE 305 *Computational Methods for Chemical Engineers*

CHBE 343 *Chemical Engineering Lab I*

CHBE 390 *Kinetics and Reactor Design*

CHBE 401/402 *Transport Phenomena I and II*

CHBE 403 *Design Fundamentals*

CHBE 404 *Product and Process Design*

CHBE 411/412 *Thermodynamics I and II*

CHBE 443 *Chemical Engineering Lab II*

CHBE 470 *Process Dynamics and Control*

**Mathematics**

MATH1 101/103 *Single Variable Calculus I and II*

MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus or equivalent honors courses*

CAAM 336 *Differential Equations in Science and Engineering or*

MATH 381 *Introduction to Partial Differential Equations*

**Physics**

PHYS 101 or 111 *Mechanics*

PHYS 102 or 112 *Electricity and Magnetism*

**Mechanical Engineering**

MECH 211 *Engineering Mechanics*

Students pursuing the BA degree in chemical engineering must meet all of the requirements for the BSChE degree with the following exceptions: CHBE 404 and 470 are not required. Also, they do not have to satisfy the requirements for either the engineering breadth or the focus area. Free electives may be substituted for these requirements to reach at least 132 semester hours for graduation.

**Prerequisites for Chemical Engineering Courses**—Before undergraduates may register for courses in chemical engineering at the 300-level and above, they must satisfy the following prerequisites.

**For CHBE 301**

MATH 101/102

CHEM 121/122 or CHEM 151/152

Corequisite: CHBE 303

**For CHBE 303**

Corequisite: CHBE 301

**For CHBE 305**

CHBE 301 and 303

**For CHBE 343**

CHBE 390, 401, and 412

**For CHBE 390**

CHBE 301, 303 and 305

MATH 211/212

**For CHBE 401**

CHBE 411

MATH 211/212

PHYS 101/102

Co/Prerequisite: CHBE 305

**For CHBE 402**

CHBE 401

Co/Prerequisites: CAAM 336 or MATH 381

**For CHBE 403**

CHBE 390, 402, and 412

Co/Prerequisites: CHBE 470 and MECH 211

**For CHBE 404**

CHBE 403

**For CHBE 411**

CHBE 301 and 303

**For CHBE 412**

CHBE 411

**For CHBE 443**

CHBE 343

**For CHBE 470**

CHBE 390, 402, and 412

## DEGREE REQUIREMENTS FOR MChE, MS, AND PHD IN CHEMICAL ENGINEERING

For general university requirements, see Graduate Degrees (pages 57–58).

**MChE Program**—For the MChE degree, students must complete at least 30 hours of courses beyond those counted for their undergraduate degree. At least 6 of the courses taken must be upper-level courses in chemical engineering and 1 must be an approved mathematics course. The chemical engineering courses selected should include process design (2 semesters) and process control, unless courses in these subjects were taken during the student's undergraduate studies.

**MS Program**—Candidates for the MS degree must:

- Complete at least 18 approved semester hours with high standing
- Submit an original research thesis
- Defend the thesis in a public oral examination

**PhD Program**—Candidates for the PhD degree must:

- Satisfactorily complete 36 semester hours of advanced course work, including both general and specialized topics (students who already have an MS degree in chemical engineering can request departmental approval for a reduction in the number of required courses)
- Pass written examinations demonstrating a general understanding of reaction engineering, thermodynamics, transport phenomena, and applied mathematics

- Prepare and present a thesis proposal
- Complete a publishable thesis representing research that is an original and significant contribution to the field of chemical and biomolecular engineering
- Pass a public oral examination in defense of the thesis
- Fulfill a residency requirement
- Complete a teaching assignment

**See CHBE in the Courses of Instruction section.**



# CHEMISTRY

## THE WIESS SCHOOL OF NATURAL SCIENCES

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Mary E. R. McHale

### INSTRUCTOR

Margaret H. Hennessy

### DISTINGUISHED FACULTY FELLOW

Robert H. Hauge

Bruce R. Johnson

### FACULTY FELLOWS

Valery Khabashesku

Kristen Kulinowski

## DEGREES OFFERED: BA, BS, MA, PHD

The undergraduate BS degree program is designed as a rigorous program for preparing students for advanced work in chemistry or a related discipline. The BA degree program is designed with a broader and more flexible program that can more easily be coupled with other majors or professional career paths. Both degree programs offer students a solid background in the fundamental principles of chemistry, the properties and reactions of chemical compounds and their uses.

Graduate studies emphasize individual research together with a fundamental understanding of chemistry beyond the students' specific interests. Faculty research interests include the synthesis and biosynthesis of organic natural products; supramolecular chemistry, molecular recognition, and biological catalysis; bioinorganic and organometallic chemistry; main group element and transition metal chemistry; the chemistry of the main group elements; the design of nanophase solids; molecular photochemistry and photophysics; infrared kinetic spectroscopy, laser, and NMR spectroscopy; studies of electron transfer in crossed beams; theoretical and computational chemistry; and the study of fullerene molecules, carbon nanotubes, and their derivatives; polymer synthesis

and characterization; molecular electronics; and molecular machines.

## DEGREE REQUIREMENTS FOR BA IN CHEMISTRY

For general university requirements, see Graduation Requirements (pages 14–15). Students choosing to receive a BA in chemistry must have a total of at least 120 semester hours at graduation, including the following courses required of all majors.

### Core Courses Required of All Chemistry Majors

#### **Chemistry**

CHEM 121/122 *General Chemistry* with laboratory or CHEM 151/152 *Honors Chemistry* with laboratory

CHEM 211/212 *Organic Chemistry* or CHEM 251/252 *Honors Organic Chemistry*

CHEM 311/312 *Physical Chemistry*

CHEM 351 *Introductory Module in Experimental Chemistry I*

CHEM 352 *Introductory Module in Experimental Chemistry II*

CHEM 353 *Introductory Module in Analytical Methods*

CHEM 360 *Inorganic Chemistry*

#### **Mathematics\***

MATH 101/102 *Single Variable Calculus I* and *II*

MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus*

(MATH 221/222 *Honors Calculus III* and *IV* may substitute for MATH 211/212)

#### **Physics**

PHYS 101 or 111 *Mechanics*

PHYS 102 or 112 *Electricity and Magnetism*

#### **Other**

One course from the following: NSCI 230, CAAM 210, CAAM 335, CAAM 336, CAAM 353, CHBE 305, or approved equivalent.

\* The Department of Mathematics may, after consultation with a student concerning his/her previous math preparation, recommend that a student be placed into a higher level math course than for which the student has official credit. The Department of Chemistry will accept this waiver of the math classes upon a written confirmation of the waiver from the Department of Mathematics and upon the student's successful completion of the higher level math course.

#### **Additional Lecture Courses**

**At least 1 course from the following:**

CHEM 401 *Advanced Organic Chemistry*

CHEM 430 *Quantum Chemistry*

CHEM 495 *Transition Metal Chemistry*

#### **Additional Laboratory Courses**

**At least 4 advanced laboratory module credit hours from the following list:**

CHEM 372 *Advanced Module in Synthesis and Characterization of Fullerene Compounds*

CHEM 373 *Advanced Module in Chemistry and Properties of Fullerene Compounds*

CHEM 374 *Advanced Module in Synthetic Chemistry*

CHEM 375 *Advanced Module in Nanochemistry*

CHEM 378 *Advanced Module in Plant Natural Products Biochemistry*

CHEM 381 *Advanced Module in Experimental Physical Chemistry*

CHEM 382 *Advanced Module in Kinetic Physical Chemistry*

CHEM 384 *Advanced Module in Instrumental Analysis*

CHEM 395 *Advanced Module in Green Chemistry*

CHEM 399 *Advanced Module: Experimental Design*

CHEM 435 *Methods of Computational Quantum Chemistry*

(CHEM 215 may substitute for one Advanced Laboratory Module)

Other advanced laboratory courses from chemically related disciplines (biochemistry, materials science, environmental engineering, etc.) may be substituted for these advanced modules, with approval of the committee. Students interested in applying for health professions programs are advised to take CHEM 215 (consult with the health professions advisor). Three hours of CHEM 491 (taken for 1 entire semester) may be substituted for 1 advanced laboratory module if no other CHEM 491 credit is taken in the same semester.

Students in the chemistry BA major must satisfy the university distribution requirements and complete no fewer than 65 semester hours in addition to the departmental requirements for the chemistry major, giving a minimum total of 120 hours for graduation.

### DEGREE REQUIREMENTS FOR BS IN CHEMISTRY

In addition to the core courses required of all chemistry majors, the BS degree requires the following course and laboratory work:

- 1 additional course from the **Additional Lecture Courses** list
- At least 3 semester hours in undergraduate research (CHEM 491) in a single semester. With departmental approval, students may satisfy this requirement with HONS 470/471, which requires participation in CHEM 491 meetings. Students also may satisfy 3 of the 6 required hours in upper-level courses with additional research.
- 6 hours credit in upper-level courses (300 level or higher) in chemistry, mathematics, computational and applied mathematics, physics, biochemistry, or other subjects with advisor approval.

PHYS 201 *Waves and Optics* and PHYS 202 *Modern Physics* are recommended but not required.

Students in the chemistry BS major must satisfy the distribution requirements (see pages 15–16) and complete no fewer than 60 semester hours in addition to the departmental requirements for the chemistry major, giving a minimum total of 127 hours for graduation.

**American Chemical Society Certification**—The Rice Department of Chemistry is on the approved list of the Committee on Professional Training of the American Chemical Society and so can certify that graduates have met the appropriate standards. The BA degree is not certifiable. For certification, students must complete:

- All degree requirements for the BS degree listed above
- CHEM 495 *Transition Metal Chemistry* as one of the additional lecture courses
- A department-approved course in biochemistry
- 9 hours total in upper-level courses from chemistry, physics, mathematics, computational and applied mathematics, biochemistry, or other courses in science or engineering with the approval of the department. The required course in biochemistry listed above counts toward this total.

A foreign language, preferably German, is recommended.

**Chemical Physics Major**—The chemical physics major leading to a BS degree is offered in conjunction with the Department of Physics and Astronomy. Students take upper-level courses in both chemistry and physics, focusing on the applications of physics to chemical systems. Students majoring in chemical physics must complete the following courses:

**Core Courses Required of All Chemical Physics Majors****Chemistry**

CHEM 121/122 *General Chemistry with Laboratory* or CHEM 151/152 *Honors Chemistry with Laboratory*  
 CHEM 211 *Organic Chemistry* or CHEM 251 *Honors Organic Chemistry*  
 CHEM 311/312 *Physical Chemistry*

**Physics**

PHYS 101 or 111 *Mechanics*  
 PHYS 102 or 112 *Electricity and Magnetism*  
 PHYS 201 *Waves and Optics*  
 PHYS 202 *Modern Physics*  
 PHYS 231 *Elementary Physics Lab II*  
 PHYS 301 *Intermediate Mechanics*  
 PHYS 302 *Intermediate Electrodynamics*

**Mathematics**

MATH 101/102 *Single Variable Calculus I and II*

MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus* (MATH 221/222 *Honors Calculus III and IV* may substitute for MATH 211/212)

**Additional Courses**

1 course from CHEM 212 or CHEM 360

2 courses from PHYS 311, PHYS 312, CHEM 430, or CHEM 415

6 hours from CHEM 215, CHEM 351, CHEM 352, CHEM 372–395, CHEM 435, PHYS 331, or PHYS 332. Up to 2 hours of independent research (CHEM 491 or PHYS 491/492 may be counted toward this requirement.)

6 credit hours from NSCI 230, CAAM 210, or mathematics or computational and applied mathematics at the 300 level or above

**ADMISSION REQUIREMENTS FOR ACCELERATED BS/PHD PROGRAM IN CHEMISTRY**

The high level of training provided in the Rice BS program enables certain specially qualified undergraduates to enter an accelerated program that allows them to complete a PhD degree in significantly less time after receiving their BS degree.

Students wishing to be considered for the accelerated BS/PhD program should contact the chemistry department graduate admissions committee.

**DEGREE REQUIREMENTS FOR MA AND PHD IN CHEMISTRY**

For general university requirements, see Graduate Degrees (pages 57–58). Students who have completed course work equivalent to that required for a BA or BS in chemistry may apply for admission to the PhD program. For more information, see Admission to Graduate Study (pages 56–57).

**MA Program**—Students are NOT normally admitted to study for an MA degree. However, this degree is sometimes awarded to students who do not wish to complete the entire PhD program. Candidates for the MA degree must:

- Complete 6 one-semester courses
- Produce a thesis that presents the results of a program of research approved by the department
- Pass a final thesis defense

Students who are admitted to PhD candidacy may apply for an automatic master's degree.

**REQUIREMENTS FOR THE PHD IN CHEMISTRY AT RICE UNIVERSITY**

The PhD in Chemistry is awarded for original research in chemistry. Candidates receive a PhD after successfully completing at least 90 semester hours of advanced study in chemistry and related fields, culminating in a thesis that

describes an original and significant investigation in chemistry. The thesis must be satisfactorily defended in a public oral examination. The student must pass the thesis defense before the end of the 16th semester of residency.

## RESEARCH

During the 1st semester of residence students will select a research advisor from among the members of the faculty; the department chair must approve this choice. In some cases, students may choose research advisors outside of the department; however, such arrangements must be approved by the chemistry faculty. The research advisor will guide the student in the choice of an appropriate research topic and in the detailed training required to complete that project. Students must enroll in CHEM 800 (Graduate Research) and must participate in 1 of the graduate seminar classes offered by the department (currently CHEM 600) each semester that the student is in residence.

## COURSE WORK

The student must complete 6 3-semester-hour graduate-level lecture courses at Rice University. In order to satisfy this requirement, each of these courses must satisfy the following criteria:

- They must be approved by the department's graduate advising committee.
- If a chemistry course, it must be at the 400 level or higher. Certain 300-level courses in other departments may be acceptable with prior approval by the department's graduate advising committee. Courses must be in technical subjects in science or engineering. Courses in teaching, presentation, or management will not be counted toward the 6-class requirement.
- Each course must be passed with a grade of B- or higher. It is possible to repeat or replace a course, upon approval of the department's graduate advising committee. A maximum of 2 courses can be repeated/replaced.

Students transferring from other graduate institutions or students with a master's degree can apply to have a maximum of 2 courses waived. A course waiver request must be accompanied by proof that a course pertinent to the student's field of research has been successfully completed at a different institution. Waiver requests must be submitted for approval to the department's graduate advising committee.

## TEACHING

Each student is required to participate in teaching for up to 4 semesters. Actual assignments are determined by departmental needs.

## QUALIFYING EXAMINATION

To advance to candidacy, the student must pass a candidacy examination. The exam has written and oral components, and the expectations for these are available in the department office. The examination committee will be composed of 3 faculty members, excluding the research advisor. The written document must be submitted to the committee at least one week before the date of the oral examination. The examination (including any follow-up work deemed necessary by the committee) must be passed by the last day of class at the end of the student's fourth semester in residency.

**ADVANCEMENT TO CANDIDACY FOR THE PHD**

The course and examination requirements listed above must be completed within 2 years of admittance to the graduate program. After completing these requirements, a student must petition to be advanced to candidacy for the PhD degree. Upon advancement to candidacy, a student chooses a thesis committee of at least 3 faculty members with the guidance and approval of the research advisor and department chair. The thesis committee must include one faculty member holding his/her primary appointment outside of the chemistry department.

**SATISFACTORY PERFORMANCE**

In order to remain in good standing, a student must receive grades above B- in CHEM 800, CHEM 700, and the various seminar courses. A student must maintain a GPA of 3.00 (B) or higher in all lecture courses. Failure to maintain satisfactory progress in research and/or grades will result in probation and possible dismissal.

Students are expected to perform satisfactorily in research as judged by their research director and thesis committee. Students also may be requested to fulfill certain service functions for the department. The student must be enrolled full time in a research group each semester that the student is in residence (except the first semester).

The student, advisor, or committee may request a meeting between student and committee at any time to evaluate progress or to determine a course of action. The thesis committee will assess the progress being made in research and may invite the student to present a discussion of his or her work. If progress is unsatisfactory, the committee may recommend a semester of probation, which could result in dismissal from the program if progress remains unsatisfactory in the subsequent semester.

**APPEAL**

Students may petition the Chemistry Department Graduate Advising Committee for variances on these academic regulations.

**See CHEM in the Courses of Instruction section.**

# CIVIL AND ENVIRONMENTAL ENGINEERING

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

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<b>ASSISTANT PROFESSORS</b> Daniel Cohan Leonardo Dueñas-Osorio Qilin Li Jamie Padgett		

### DEGREES OFFERED: BA, MCE, MEE, MES, MS, PHD

Civil and environmental engineering (CEVE) is a broad and diverse field of study that offers students an education with several degree options. The most flexible degree options are at the bachelor's level, where students can major in civil engineering (BS or BA) or complete a double major with any other Rice University major. Three nonthesis graduate degrees (MCE, MEE, and MES) are available to students who desire additional education and specialization in civil engineering, environmental engineering, or environmental sciences. Joint MBA/Master of Engineering degrees also are available in conjunction with the Jesse H. Jones Graduate School of Management.

Students admitted for graduate study leading to MS or PhD degrees must complete a rigorous course of study that combines advanced course work with scholarly research culminating in the public defense of a written thesis. Graduate research is carried out in a range of areas reflecting the interests of the department's faculty. Examples include environmental engineering, geotechnical engineering, structural engineering and mechanics, hydrology, water resources and water quality management, air pollution and its control, and hazardous waste treatment.

### BS DEGREE IN CIVIL ENGINEERING

The Department of Civil and Environmental Engineering (CEVE) offers an innovative and challenging BS engineering curriculum that is designed to provide significant flexibility to the student. Specific details and typical course layouts by semester can be found at the departmental website: [ceve.rice.edu](http://ceve.rice.edu).

The main features of the ABET accredited BS in Civil Engineering are as follows:

- 6 core courses (21 hours) primarily aimed at introduction to civil and environmental engineering, followed by 10 courses (30 hours) that represent the 4 thrust areas within CEVE, with at least 4 courses from one thrust area.

- The total required CEVE courses are kept to a minimum level of 51 hours to provide maximum flexibility to the student.
- The thrust areas include (1) environmental engineering (air and water quality, transport theory, modeling, and energy); (2) hydrology and water resources (watershed and aquifer management, flood prediction, data analysis, GIS); (3) structural engineering and mechanics (structural analysis, mechanics, design, matrix methods); (4) urban infrastructure and management (transportation systems, urban systems, soil mechanics, engineering economics, management)
- A choice of free electives (18 hours) to allow maximum flexibility for students to choose from an approved list of courses
- General science (39 hours) courses cover mathematics, physics, and chemistry
- Distribution (24 hours) courses as per university requirements

A total of at least 132 hours are required for graduation with a BS (see detailed list below).

Additional features of the BS curriculum include:

- Freshman/sophomore year courses that introduce fundamentals of CEVE primarily targeted at students with diverse science, engineering, and humanities backgrounds (CEVE 101, 201, 203, 211, and 311, 312)
- Special-topics course available in the final year to help attract the best students to perform undergraduate research in the department.
- Engineers Without Borders (EWB) (CEVE 315) is an important component of the program. This exciting new endeavor allows undergraduates to have an experience in a developing country where they are able to actually design and build a project to help society. Students have been attracted to the program in large numbers. (see [ceve.rice.edu](http://ceve.rice.edu))

### Course Requirements

#### **General Science Requirements (\* or an equivalent approved course)**

CAAM 210 *Introduction to Engineering Comp* (3)

CAAM 335\* *Matrix Analysis* (3)

CHEM 121 *General Chemistry with Lab* (4)

CHEM 122 *General Chemistry with Lab* (4)

CHEM 211 or PHY 201 or BIOS 201 (3)

MATH 101 *Single Variable Calculus I* (3)

MATH 102 *Single Variable Calculus II* (3)

MATH 211 *Ordinary Differential Equations* (3)

MATH 212 *Multivariable Calculus* (3)

PHYS 101 *Mechanics with Lab* (3)

PHYS 102 *Electricity and Magnetism with Lab* (4)

STAT 310\* *Probability and Statistics* (3)

#### **CEVE Core Requirements (21 credits)**

CEVE 101 (F) *Fundamentals of CEVE* (3)

CEVE 203 (F) *Environmental Eng. Processes* (3)

CEVE 211 (F) *Engineering Mechanics* (3)

CEVE 311 (S) *Mechanics of Solids and Structures* (3)

CEVE 312 (S) *Strength of Materials Lab* (1)

CEVE 371 (F) *Fluid Mechanics* (3)

CEVE 402 *Environmental Engineering Lab*

CEVE 480 (S) *Senior Design Project* (4)

#### **Area I Environmental Engineering (select 6 approved hours)**

CEVE 307 (S) *Energy and the Environment*

CEVE 401 (F) *Environmental Chemistry* (3)

CEVE 402 (F) *Environmental Chemistry Lab* (1)

CEVE 406 (S) *Environmental Law* (3)

CEVE 411 (S) *Air Resources Management* (3)

CEVE 434 (F) *Fate and Transport of Contaminants in the Environment* (3)

Or any approved environmental course in CEVE/CENG

#### **Area II Hydrology and Water Resources (select 6 approved hours)**

CEVE 412 (S) *Hydrology and Watershed Analysis* (3)

CEVE 418 *Quantitative Hydrogeology*

CEVE 443 (F) *Atmospheric Science* (3)

CEVE 450 (S) *Remote Sensing* (3)

CEVE 451 (F) *Analysis of Environmental Data* (3)

CEVE 453 (F) *Geographical Information Science* (3)



CEVE 512 (S) *Hydrologic Design Lab* (3)

Or any approved computational course in CEVE/CAAM/ESCI

**Area III Structural Engineering and Mechanics (select 6 approved hours)**

CEVE 304 (S) *Structural Analysis* (3)

CEVE 405 (S) *Steel Design* (3)

CEVE 407 (F) *Reinforced Concrete Design* (3)

CEVE 408 (F) *Structures Lab* (1)

CEVE 427 (F) *Matrix Methods in Structural Mechanics* (3)

Or any approved structures/mechanics course in CEVE/MECH

**Area IV Urban Infrastructure and Management (select 6 approved hours)**

CEVE 322 (F) *Engineering Economics* (3)

CEVE 452 (S) *Urban Transportation Systems* (3)

CEVE 470 (F) *Basic Soil Mechanics*

CEVE 479/505 (F) *Engineering Project Management*

CEVE 492 (S) *Complex Urban Systems*

Or any approved urban infrastructure and management course in CEVE/MGMT/ECON

**List of CEVE Recommended Elective Courses:**

CEVE 308, 315, 316, 400, 417, 454, 490, 499

**ABET PROGRAM OBJECTIVES**

*(See website at [ceve.rice.edu/](http://ceve.rice.edu/) for additional information.)*

1. Develop/demonstrate strong problem-solving and communication skills
2. Achieve leadership position in technical or managerial area
3. Demonstrate initiative and innovative thinking in project work
4. Maintain a keen awareness of ethical, social, environmental, and global concerns
5. Remain engaged in continuing learning, including advanced degrees
6. Prepare for a Professional Engineering License

**BA DEGREE IN ENVIRONMENTAL ENGINEERING SCIENCES**

The BA degree in Environmental Engineering Sciences is designed to provide access to topics of common interest to students across the disciplines at Rice University. It is tailored to the specific needs of each student by discussion with and approval by the CEVE departmental advisor. An advisor will be assigned by the CEVE department chair, normally during the 1st year of study. Five core courses, plus 7 courses in a focused specialty area (see below for example curricula) of study are required; total CEVE requirements approximately 39 hours. In addition, each student is responsible for satisfying the university distribution requirements (24 hours) and additional electives for a total of at least 120 hours for graduation with a BA in Environmental Engineering Sciences. **Although not required, students are encouraged to double major in their focus specialty area.**

The coherent and complete core curriculum is designed to give Rice Undergraduate students a consistent technological literacy through the lens of civil and environmental engineering and to prepare students for graduate school in engineering, various sciences (depending on focus), economics, business MBA, political science, law, or medicine. Select students will be invited to finish an accelerated MS/PhD degree in the CEVE department at Rice (meet with your advisor or department chair for details). Those students who want to obtain an ABET accredited engineering degree must follow a BS degree program in one of the engineering disciplines, including CEVE.

A student must demonstrate proficiency in the basic concepts of mathematics, computation, chemistry, and physics. Generally, this will require that these subjects were studied previously, e.g., AP exams or concurrent enrollment with CEVE 101 or 201.

Seven courses from approved electives, including 4 courses from 1 specific focus area; 4 of these 7 courses must be 300, or above, and 2 of these upper-division courses must be from the CEVE curriculum.

**Five Core courses required for all BA Environmental Engineering Science majors:**

CEVE 101 *Fundamentals of CEVE* (3)

CEVE 201 *Urban and Environmental Systems* (4)\*

CEVE 203 (204) *Environmental Engineering Processes* (4\*)

CEVE 401 *Intro Environmental Chemistry* (4)

CEVE 402 *Lab* (1)

CEVE 412 *Hydrology and Watershed Analysis* (3)

\* Courses with laboratories

**Typical “focus specialty areas” might include (subject to advisor approval):**

1. Environmental Engineering: CEVE 307, 406, 411, 434; CEVE 451 plus 3 approved electives
2. Earth Science: ESCI 101, 321, 322, 353, CEVE 308, 406, 411
3. Biology: BIOS 201, 202, 211, 301, CEVE 308, 406, 411
4. Chemical Engineering: CENG 301, 390, 401, 402; CEVE 411, 434, 443
5. Chemistry: CHEM 211, 212; CEVE 406, 511 plus 3 approved electives
6. Economics: ECON 211, 212, 370, 450, 461; CEVE 406, 411
7. Management: ECON 211, 212, 461; ACCO 305; POLI 336; CEVE 406, 411

Engineers Without Borders (EWB) (CEVE 315) is an important component of the CEVE program. This exciting new endeavor allows undergraduates to have an experience in a developing country where they are able to actually design and build a project to help society. Students have been attracted to the program in large numbers.

**BA DEGREE IN CIVIL ENGINEERING**

The BA degree in civil engineering is designed to provide access to topics of common interest to students across the disciplines at Rice University. It is tailored to the specific needs of each student by discussion with and approval by the CEVE departmental advisor. An advisor will be assigned by the CEVE department chair, normally during the first year of study. For the BA degree in civil engineering the students must have a total of at least 120 hours. A student must demonstrate proficiency in the basic concepts of mathematics, computation, chemistry, and physics. Generally, this will require subjects studied previously, e.g., AP exams. The BA degree in civil engineering requires 21 hours of general math and science courses, 25 hours of core civil engineering courses, and 73 hours of electives (distribution courses 24 hours and remaining open or free electives 49 hours). Although not required, students are encouraged to double major in their focus specialty area.

The coherent and complete core curriculum is designed to give Rice undergraduate students a consistent technological literacy through the lens of civil and environmental engineering and to prepare students for graduate school in engineering. Those students who want to obtain an ABET accredited engineering degree must follow a BS degree in civil engineering program.

**Required general math and science courses**

MATH 101 <i>Single Variable Calculus I</i>	3
MATH 102 <i>Single Variable Calculus II</i>	3
MATH 211 <i>Ordinary Differential Equations</i> [MATH 212 or 221 recommended]	3
PHYS 101* <i>Mechanics with Lab</i>	3
PHYS 102* <i>Electricity and Magnetism with Lab</i>	3
One of [COMP 110, CAAM 210, CAAM 335]	3
One of [BIOS 122, CHEM 121/122, ELEC 242, MECH 200, MSCI 301]	3

\* or equivalent

**Total: 21 hrs****Required core civil engineering courses**

CEVE 101 <i>Fundamentals of CEVE</i>	3
CEVE 211 <i>Engineering Mechanics</i>	3
CEVE 311 <i>Mechanics of Solids and Structures</i>	3

CEVE 312 <i>Strength of Materials</i>	1*
CEVE 371 <i>Fluid Mechanics</i>	3
* Laboratory	
<b>Total:</b>	<b>13 hrs</b>

**Any 4 civil engineering courses from the following:**

CEVE 202 Environmental Eng. Processes	3
CEVE 304 Structural Analysis	3
CEVE 322 Engineering Economics for Engineers	3
CEVE 405 Steel Design	3
CEVE 407 Reinforced Concrete Design	3
CEVE 412 Hydrology and Watersheds	3
CEVE 427 Matrix Methods in Structural Mechanics	3
CEVE 452 Urban Transportation Systems	3
CEVE 470 Infrastructure Geotechnical Engineering	4
<b>Total:</b>	<b>12 hrs</b>

Engineers Without Borders (EWB) (CEVE 315) is an important component of the CEVE program. This exciting new endeavor allows undergraduates to have an experience in a developing country, where they are able to actually design and build a project to help society. Students have been attracted to the program in large numbers.

**DEGREE REQUIREMENTS FOR MCE, MEE, MES, MS, AND PHD**

**Admission**—Applicants pursuing graduate education in environmental engineering or hydrology should have preparation in mathematics, science, and engineering or related courses. A BS degree, or degree in natural science is preferred. Applicants pursuing graduate education in structural engineering, structural mechanics, and geotechnical engineering should have a BSCE with a significant emphasis on structural engineering, but students with other undergraduate degrees may apply if they have adequate preparation in mathematics, mechanics, and structural analysis and design. Applicants for graduate degrees should have a BS or BA in related areas of science and engineering. Successful applicants typically have at least a 3.00 (B) grade point average in undergraduate work and high Graduate Record Examination (GRE) scores. For general university requirements, see Graduate Degrees and Admission to Graduate Study (pages 56–58).

**MS Program**—The Master of Science degree is offered in both civil engineering and environmental engineering. For general university requirements, see Graduate Degrees (pages 57–58). To earn a MS degree, students must:

- Complete at least 24 semester hours of approved courses. For students studying environmental engineering, this must include 1 course each in environmental chemistry, water treatment, hydrology, and air quality. For students studying civil, structural engineering, and mechanics, this must include 1 course each in structural engineering, mechanics, advanced mathematics, and dynamic systems (comparable course work completed previously may be substituted for the core courses).

- Select a thesis committee according to department requirements and conduct original research in consultation with the committee.
- Present and defend in oral examination an approved research thesis.

Students take the oral exam only after the committee determines the thesis to be in a written format acceptable for public defense. Normally, students take 2 academic years and the intervening summer to complete the degree.

Students intending to extend their studies into the PhD degree program should note that the department does not grant an automatic MS degree to candidates who have not written a satisfactory master's thesis.

**MCE Program**—The Master of Civil Engineering (MCE) is a professional nonthesis degree requiring 30 hours of study. Students with a BS in civil engineering are eligible to apply. (see Graduate Degrees pages 57–58). To earn an MCE degree, students must complete 30 semester hours of approved courses.

**MBA/MCE Program**—For general university requirements, see Graduate Degrees (pages 57–58). See also Management and Accounting (pages 205–216). To earn a MBA/MCE degree, students must:

- Complete 24 semester hours of civil engineering courses.
- Complete 52 semester hours of business administration courses.

**MEE Program**—The Master of Environmental Engineering (MEE) is a professional nonthesis degree requiring 30 hours of study. Students who have a BS degree in any field of engineering may apply (see Graduate Degrees pages 57–58).

**MES Program**—The Master of Environmental Science (MES) is a professional nonthesis degree requiring 30 hours of study. To enter the MES program, applicants must have a BA or BS degree in any of the natural or physical sciences (see Graduate Degrees pages 57–58).

**PhD Program**—To earn a PhD degree, candidates must successfully accomplish the following (spending at least 4 semesters in full-time study at Rice). (See candidacy, oral examinations, and the thesis (pages 65–67).

- Complete 90 semester hours of approved course work past BS (60 semester hours past MS) with high standing.
- Pass a preliminary written examination in civil and environmental engineering.
- Pass a qualifying examination on course work, proposed research, and related topics.
- Complete a dissertation indicating an ability to do original and scholarly research.
- Pass a formal public oral examination on the thesis and related topics.

PhD candidates in civil and environmental engineering take the preliminary exam, administered by department faculty, after 2 semesters of course work. Candidates who pass this exam then form a doctoral committee according to department requirements. The qualifying examination administered by the doctoral committee after candidates develop a research proposal evaluates their preparation for the proposed research and identifies any areas requiring additional course work or study.

# CLASSICAL STUDIES

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## THE SCHOOL OF HUMANITIES

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Donald Ray Morrison

Harvey Yunis

### ASSOCIATE PROFESSOR

Hilary Mackie

### ASSISTANT PROFESSORS

Scott McGill

Caroline Quenemoen

### LECTURERS

Edward Anderson

Marcel Widzisz

### DEGREE OFFERED: BA

The classical department offers instruction in the Greek and Latin languages, in Greek and Roman literature (studied in the original and in translation), in the classical civilizations surveyed as a whole, and in particular themes, genres, and periods of classical culture and its influence through subsequent ages.

We recognize that students come to the study of ancient Greece and Rome with a whole spectrum of different kinds of interest. Some will want to concentrate on learning the ancient languages and reading the classical texts in the original Greek or Latin. Others will desire a broader introduction to the cultures of Greece and Rome and their legacy. With this in mind, the classics department provides maximum flexibility without sacrifice of focus. We cater to students who wish to prepare for graduate school in classics and also to students who are interested in Greek and Roman culture for other reasons and wish to take a less specialized approach. Students will be able to explore ancient Greece and Rome from a variety of different angles and with whatever emphasis best suits their individual needs and goals.

The classics department offers 2 tracks to satisfy the requirements for a BA (specific information below): the classics track emphasizes the ancient languages and reading classical texts in the original; the classical civilizations track allows for a broader set of approaches and does not include a language requirement.

Classical studies majors, in either track, will, if they wish, have the opportunity to engage in research. In the final semester of study, a student may enroll in CLAS 493, in which the student writes a senior thesis on a topic of the student's choice in consultation with a faculty member.

The classics department also offers a program in the Classical Legacy. Using courses in translation, this program makes classical antiquity accessible to a wide range of students and offers those students basic knowledge of major trends in Western intellectual and cultural history. Courses offer grounding in classical literature, art, thought, and history and relate classical culture to later attempts in post classical and contemporary cultures to assimilate, emulate, and recreate classical models. A highlight of the Classical Legacy program is CLAS 321, a 2-week study-trip to Rome at the end of the spring semester, organized and run by Rice professors for Rice students. For current information on the Classical Legacy program and the study-trip to Rome, consult the website: [classicallegacy.rice.edu/](http://classicallegacy.rice.edu/).

Further information on the department, its courses, its faculty members, and its events is available on the web: [classics.rice.edu/](http://classics.rice.edu/).

Policy on Advanced Placement credit: For the exam on "Latin Literature," new matriculants who score 4 receive 3 hours credit for LATI 104 and new matriculants who score 5 receive 3 hours credit for LATI 204 and D1 distribution credit. For the exam on "Latin: Virgil," new matriculants who score 4 receive 3 hours credit for LATI 104 and new matriculants who score 5 receive 3 hours credit for LATI 202 and D1 distribution credit.

### DEGREE REQUIREMENTS FOR BA IN CLASSICAL STUDIES

For general university requirements, see Graduation Requirements (pages 14–15).

Students majoring in classical studies may complete either of 2 tracks.

For the classics track, students must complete 30 semester hours (10 courses) listed under Greek, Latin, or Classics, including at least 2 of the following 3 courses:

- CLAS 107 *Greek Civilization and Its Legacy*
- CLAS 108 *Roman Civilization and Its Legacy*
- CLAS 235 *Classical Mythology: Interpretation, Origins, and Influence*

and at least 9 hours (3 courses) in either Greek or Latin at the 300 level or higher.

For the classical civilizations track, students must complete 30 semester hours (10 courses) listed under Greek, Latin, or Classics, including at least 2 of the following 3 courses:

- CLAS 107 *Greek Civilization and Its Legacy*
- CLAS 108 *Roman Civilization and Its Legacy*
- CLAS 235 *Classical Mythology: Interpretation, Origins, and Influence*

Some courses in ancient philosophy, history, art history, and religion offered by the departments of Philosophy, History, Art History, and Religious Studies also satisfy requirements for either track of the classical studies major. For advice on which courses do this, consult the undergraduate advisor.

**See CLAS, GREE, and LATI in the Courses of Instruction section.**

# COGNITIVE SCIENCES

## THE SCHOOL OF SOCIAL SCIENCES

### **DIRECTOR**

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Claire Bower

Darcy Burgund

Denise Chen

Katherine Crosswhite

Robert Englebretson

Melinda Fagan

Nicoletta Orlandi

### **DEGREE OFFERED: BA**

Researchers in this interdisciplinary field seek to understand such mental phenomena as perception, thought, memory, the acquisition and use of language, learning, concept formation, and consciousness. Some investigators focus on relations between brain structures and behavior, some work with computer simulation, and others work at more abstract theoretical levels.

### **DEGREE REQUIREMENTS FOR BA IN COGNITIVE SCIENCES**

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in cognitive sciences must complete 5 core courses and 7 additional courses (see below). Among the 7 additional courses, at least 3 and no more than 4 must be in a single area of concentration—linguistics, philosophy, psychology, or neuroscience.

### **INTRODUCTORY COURSES**

Because the major is interdisciplinary, no single course introduces the full range of the subject. However, students who are interested in majoring in cognitive sciences should take 1 or more of the following courses during their 1st and 2nd years: LING200, PHIL103, PSYC101, or PSYC203.

### **HONORS PROGRAM**

Students with a 3.5 GPA in cognitive sciences and 3.3 overall GPA may apply for the cognitive sciences honors program. Students in the honors program are expected to conduct an independent research project of either 1 or 2 semesters under the guidance of a member of the cognitive sciences faculty. Students who wish to enter this program should consult with prospective advisors during their junior year and submit a proposal by the end of the semester preceding the initiation of the project. Typically, this means submitting a proposal by the end of the junior year and beginning the project during the fall of the senior year. Proposal will be reviewed by both the supervisor

and the program director. Students who undertake a 2-semester project will be allowed to continue into the 2nd semester only if their advisor judges that sufficient progress has been made during the 1st semester. At the end of a project, honors students are expected to submit a final paper to both their advisor and the program director and make an oral presentation. For more details, contact the program director.

## INDEPENDENT RESEARCH

Majors may undertake supervised independent research by enrolling in CSCI390 or the honors program and may apply up to 9 credits of independent research toward the major. Students who wish to take CSCI390 must complete a CSCI390 contract and have it approved by their supervisor and the program director prior to the end of the 1st week of classes. All students taking CSCI390 also must write a substantive research paper, which is to be submitted to both their advisor and the program director at the end of the semester. (Copies of the contract form and instructions are available on the "forms" section of the cognitive sciences website.)

## Core Courses

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The core courses are divided into 5 groups.  
Majors just take one course from each group.

### **Computer Science**

*Though all of these courses may be used to satisfy the computer science core requirements, no more than 1 may be taken for credit within the major*

CAAM 210 *Introduction to Engineering Computation*

COMP 200 *Elements of Computer Science*

COMP 201 *Principles of Object-Oriented Programming*

COMP 210 *Introduction to Principles of Scientific Computation*

### **Psychology**

PSYC 203 *Introduction to Cognitive Psychology*

### **Linguistics**

LING 200 *Introduction to the Scientific Study of Language*

## Additional Courses

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At least 3 and no more than 4 courses must be in 1 of the following areas of concentration: linguistics, philosophy, psychology, or neuroscience. Note: you may not use the same courses to fulfill both a core course requirement and an additional course requirement; in other words, no double counting.

### **Cognitive Sciences**

CCSCI 390 *Supervised Research in Cognitive Science*

CSCI 481 *Honors Project*

CSCI 482 *Honors Project*

LING 306 *Language and the Mind*

LING 315 *Semantics*

### **Philosophy**

PHIL 103 *Philosophical Aspects of Cognitive Science*

PHIL 305 *Mathematical Logic*

PHIL 312 *Philosophy of Mind*

### **Advanced Psychology**

PSYC 308 *Memory*

PSYC 309 *Psychology of Language*

PSYC 351 *Psychology of Perception*

PSYC 360 *Thinking*

PSYC 362 *Biopsychology*

PSYC 430 *Computational Modeling of Cognitive Processes*

PSYC 432 *Brain and Behavior*

### **Computer Science**

COMP 212 *Intermediate Programming*

COMP 440 *Artificial Intelligence*

COMP 450 *Algorithmic Robotics*

### **Linguistics**

LING 200 *Introduction to the Scientific Study of Language*

LING 300 *Linguistic Analysis*

LING 301 *Phonetics*

LING 304 *Introduction to Syntax*

LING 306 *Language and the Mind*



- LING 311 *Phonology*  
 LING 315 *Semantics*  
 LING 317 *Language and Computers*  
 LING 402 *Syntax and Semantics*  
 LING 403 *Foundations of Modern Linguistics*  
 LING 404 *Research Methodologies and Linguistic Theories*  
 LING 405 *Discourse Analysis*  
 LING 411 *Neurolinguistics*  
 LING 412 *Language and Intelligence*

### **Neuroscience**

Many of the neuroscience courses are taught by Baylor College of Medicine faculty.

For more information, see  
<http://www.ruf.rice.edu/~neurosci/neurocoursesmain.html>.

- BIOS 421 *Neurobiology*  
 CAAM 415 *Theoretical Neuroscience*  
 ELEC 481 *Fundamentals of Systems Physiology and Biophysics*  
 LING 411 *Neurolinguistics*  
 PSYC 362 *Biopsychology*  
 PSYC 432 *Brain and Behavior (formally cross-listed as CSCI 420)*  
 NEUR 500 *Functional Neuroanatomy and Systems Neuroscience*  
 NEUR 501 *Cognitive Neuroscience I*  
 NEUR 502 *Cognitive Neuroscience II*  
 NEUR 503 *Molecular Neuroscience I and II*  
 NEUR 504 *Cellular Neurophysiology I and II*  
 NEUR 505 *Optical Imaging in Neuroscience*  
 NEUR 506 *Learning and Memory*  
 NEUR 511 *Integrative Neuroscience Core Course (1st semester)*  
 NEUR 512 *Integrative Neuroscience Core Course (2nd semester)*  
 NEUR 515 *Neural Development*

### **Philosophy**

- PHIL 103 *Philosophical Aspects of Cognitive Science*  
 PHIL 303 *Theory of Knowledge*  
 PHIL 305 *Mathematical Logic*  
 PHIL 312 *Philosophy of Mind*  
 PHIL 353 *Philosophy of Language*  
 PHIL 357 *Incompleteness, Undecidability, and Computability*

### **Psychology**

- PSYC 308 *Memory*  
 PSYC 309 *Psychology of Language*  
 PSYC 340 *Research Methods*  
 PSYC 351 *Psychology of Perception*  
 PSYC 352 *Formal Foundations of Cognitive Science*  
 PSYC 360 *Thinking*  
 PSYC 362 *Biopsychology*  
 PSYC 370 *Introduction to Human Factors*  
 PSYC 409 *Methods in Human-Computer Interaction*  
 PSYC 411 *History of Psychology*  
 PSYC 430 *Computational Modeling of Cognitive Processes*  
 PSYC 432 *Brain and Behavior (formally cross-listed as CSCI 420)*  
 PSYC 441 *Human-Computer Interaction*  
 PSYC 465 *Olfactory Perception*

### **Other**

- ANTH 406 *Cognitive Studies in Anthropology and Linguistics*  
 ELEC 201 *An Introduction to Engineering Design*  
 ELEC 498 *Introduction to Robotics*  
 STAT 300 *Model Building*

# COMPUTATIONAL AND APPLIED MATHEMATICS

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

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(joint MEMS)

Michael M. Carroll  
(joint MEMS)

Steven J. Cox

Matthias Heinkenschloss

William W. Symes

Richard A. Tapia

Yin Zhang

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Angelo Miele (joint MEMS)

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Henry Rachford

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Adam B. Singer

Paul D. Smolen

Andreas S. Tolia

### RESEARCH PROFESSORS

Robert E. Bixby

John E. Dennis

### INSTRUCTORS

Kirk D. Blazek

Elaine T. Hale

## DEGREES OFFERED: BA, MCAM, MCSE, MA, PHD

Courses within this major can provide foundations applicable to the many fields of engineering, physical sciences, life sciences, behavioral and social sciences, and computer science. Undergraduate majors have considerable freedom to plan a course of study consistent with their particular interests.

The professional degree (MCAM), for persons interested in practicing within this field, emphasizes general applied mathematics, operations research and optimization, and numerical analysis, while the MA and PhD programs concentrate on research. Faculty research interests fall in the 4 general areas of numerical analysis and computation; physical mathematics; operations research and optimization; and mathematical modeling in physical, biological, or behavioral sciences.

A further advanced degree program in computational science and engineering (CSE) addresses the current need for sophisticated computation in both engineering and the sciences. Such computation requires an understanding of

parallel and vector capabilities and a range of subjects including visualization, networking, and programming environments. An awareness of a variety of new algorithms and analytic techniques also is essential to maximizing the power of the new computational tools.

A joint MBA/Master of Engineering degree also is available in conjunction with the Jesse H. Jones Graduate School of Management.

## DEGREE REQUIREMENTS FOR BA IN COMPUTATIONAL AND APPLIED MATHEMATICS

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in computational and applied mathematics are required to complete the 51 semester hours spelled out in the following program of study.

**Introductory Courses:** Typically completed during the 1st 2 years

MATH 101 <i>Single Variable Calculus I*</i>	CAAM 210 <i>Introduction to Engineering Computation</i>
MATH 102 <i>Single Variable Calculus II</i>	CAAM 335 <i>Matrix Analysis</i>
MATH 212 <i>Multivariable Calculus+</i>	
COMP 110 <i>Computation in Science and Engineering*</i>	

\*Students with prior experience with calculus and/or computational science may petition the department for a waiver.

+Students may substitute Honors Calculus sequence (MATH 221, 222) for MATH 212.

Entering students should enroll in the most advanced course commensurate with their background; advice is available from the CAAM department during Orientation Week.

**Intermediate Courses:** Typically completed by the end of the 3rd year

CAAM 336 <i>Differential Equations in Science and Engineering</i>	CAAM 378 <i>Introduction to Operations Research and Optimization</i>
(or STAT 310 <i>Probability and Statistics</i> or STAT 331 <i>Applied Probability</i> )	CAAM 401 <i>Analysis I</i>
	CAAM 402 <i>Analysis II</i>

**Advanced Courses:** Typically completed during the 4th year

CAAM 453 <i>Numerical Analysis I</i>
CAAM 454 <i>Numerical Analysis II</i>

**Electives:** 5 courses at 300 level or above; 2 of which must be at the 400-level or above (chosen in consultation with a CAAM undergraduate advisor).

**Highly Recommended Electives:**

CAAM 415 <i>Theoretical Neuroscience</i>	MATH 423 <i>Partial Differential Equations</i>
CAAM 420 <i>Computational Science I</i>	MATH 425 <i>Integration Theory</i>
CAAM 436 <i>Partial Differential Equations of Mathematical Physics</i>	MATH 427 <i>Complex Analysis</i>
CAAM 460 <i>Optimization Theory</i>	STAT 431 <i>Overview of Mathematical Statistics</i>

## DEGREE REQUIREMENTS FOR MCAM, MA, AND PHD IN COMPUTATIONAL AND APPLIED MATHEMATICS

**Admission**—Admission to graduate study in computational and applied mathematics is open to qualified students holding bachelor's or master's degrees (or their equivalent) in engineering; mathematics; or the physical, biological, mathematical, or behavioral sciences. Department faculty evaluate the previous academic record and credentials of each applicant individually. For general information, see Graduate Degrees (pages 56–58) and Admission to Graduate Study (pages 56–57).

Applicants should be aware that it normally takes 2 years to obtain a master's degree and an additional 2 to 4 years for the doctoral degree.

**MCAM Program**—This professional degree program emphasizes the applied aspects of mathematics. The MCAM degree requires satisfactory completion of at least 30 semester hours of course work approved by the department.

**MA Program**—For an MA in computational and applied mathematics, students must:

- Complete at least 30 semester hours at the graduate level, including 5 courses in computational and applied mathematics, in addition to thesis work
- Produce an original thesis acceptable to the department
- Perform satisfactorily on a final public oral examination on the thesis

For students working toward the PhD, successful performance on the master's thesis may fulfill the PhD thesis proposal requirements upon approval by the thesis committee.

**PhD Program**—For a PhD in computational and applied mathematics, students must:

- Complete a course of study approved by the department, including at least 2 courses outside the major area
- Perform satisfactorily on preliminary and qualifying examinations and reviews
- Produce an original thesis acceptable to the department
- Perform satisfactorily on a final public oral examination on the thesis

**Financial Assistance**—Graduate fellowships, research assistantships, and graduate scholarships are available and are awarded on the basis of merit to qualified students. Current practice in the department is for most doctoral students in good standing to receive some financial aid.

## DEGREE REQUIREMENTS FOR MCSE AND PHD IN COMPUTATIONAL SCIENCE AND ENGINEERING

**CSE Program Area**—Recognizing the increasing reliance of modern science and engineering on computation as an aid to research, development, and design, the Department of Computational and Applied Mathematics, in conjunction with the Departments of Biochemistry and Cell Biology, Earth Science, Computer Science, Chemical and Biomolecular Engineering, Electrical and Computer Engineering, Environmental Science and Engineering, and Statistics, has established an advanced degree program in computational science and

engineering (CSE). The program focuses on modern computational techniques and provides a resource for training and expertise in this area.

The program is administered by a faculty committee chosen by the deans of engineering and natural sciences, with ultimate oversight by the provost. The Computational Science Committee (CSC) helps students design an appropriate course of study and sets the examination requirements.

Students may enter the CSE program either directly or indirectly through one of the participating departments (see list above). In all cases, however, students must fulfill the admissions requirements of 1 department, which is their associated department. Students then meet the normal requirements for graduate study within that department in every way (including teaching and other duties), except that the curriculum and examination requirements are set by the CSC.

**MCSE Program**—This program's intent is to produce professional experts in scientific computing able to work as part of an interdisciplinary research team. Training is concentrated in state-of-the-art numerical methods, high-performance computer architectures, use of software development tools for parallel and vector computers, and the application of these techniques to at least 1 scientific or engineering area. For general university requirements, see Graduate Degrees (pages 57–58).

For the MCSE degree, students must complete at least 30 semester hours of course work approved by the CSC; no more than 2 of the courses may be taken at the 300 level, taken outside the CSE program area, or satisfied by transfer credit. Each student's program of study must meet the requirements listed below. Modification of requirements can be requested by petition.

#### **Required Courses**

CAAM 420 *Computational Science I* (taken as soon as possible)

CAAM 520 *Computational Science II* (taken as soon as possible)

CAAM 551 *Numerical Linear Algebra*

#### **1 course from the following**

COMP 412 *Compiler Construction*  
(or ELEC 425 *Computer Systems Architecture*)

CAAM 452 *Numerical Methods for Differential Equations*

CAAM 453 *Numerical Analysis I*

CAAM 454 *Numerical Analysis II*

CAAM 464 *Numerical Optimization*

#### **Computational Science Electives**

4 courses selected from an approved list of COMP or CAAM courses (at least 2 courses at the 500 level)

#### **Open Electives**

2 approved courses other than CAAM or COMP courses at the 300 level or above (a computational project taken within a participating department also satisfies this requirement)

#### **Application Areas**

An appropriate sequence of courses from a participating application area at the 300 level or above

**PhD Program**—Study at the doctoral level seeks to advance the field through original research. For general university requirements, see Graduate Degrees (pages 57–58). For the PhD in computational science and engineering, students must:

- Complete a course of study approved by the CSC, including at least 2 courses outside the major area

- Perform satisfactorily on preliminary and qualifying examinations and reviews
- Produce an original thesis acceptable to the CSC
- Perform satisfactorily on a final public oral examination on the thesis

**See CAAM in the Courses of Instruction section.**

# COMPUTER SCIENCE

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

### CHAIR

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G. Anthony Gorry

Lydia Kavradi

Krishna Palem

Vivek Sarkar

Devika Subramanian

Moshe Y. Vardi

Joe D. Warren

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Jack Dongarra

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S. Lennart Johnsson

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John Mellor-Crummey

Dave Johnson

Yehia Massoud

Scott Rixner

Dan Wallach

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Eugene Ng

Walid Taha

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P. Read Montague

Scott K. Warren

### FACULTY FELLOW

William Scherer

### RESEARCH SCIENTISTS

Zoran Budimlic

Timothy Harvey

Guohua Jin

Charles Koebel

Mark Moll

Linda Torczon

### LECTURERS

John Greiner

Dung "Zung" Nguyen

Stephen Wong

### POSTDOCTORAL RESEARCH ASSOCIATES

Doron Bustan

Arun Chauhan

Yuri Dotsenko

Nurit Haspel

Joël Ouaknine

Kedar Swadi

Yuan Zhao

## JOINT APPOINTMENTS

### WITH ELECTRICAL AND COMPUTER ENGINEERING

#### PROFESSOR

J. Robert Jump

#### ASSOCIATE PROFESSORS

Joseph Cavallaro

Edward Knightly

Peter Varman

#### ASSISTANT PROFESSORS

Farinaz Koushanfar

Vijay Pai

Yehia Massoud

Kartik Mohanram

### WITH MECHANICAL ENGINEERING

#### ASSITANT PROFESSOR

Marcia K. O'Malley

### WITH CHEMISTRY

#### PROFESSOR

James Tour

#### RESEARCH PROFESSOR

Peter Druschel

**DEGREES OFFERED: BA, BSCS, MCS, MS, AND PHD**

Computer science is concerned with the study of computers and computing, focusing on algorithms, programs and programming, and computational systems. The main goal of the discipline is to build a systematic body of knowledge, theories, and models that explain the properties of computational systems and to show how this body of knowledge can be used to produce solutions to real-world computational problems. Computer science is the intellectual discipline underlying information technology, which is widely accepted now as the ascendant technology of the next century. Students in computer science at Rice benefit from the latest in equipment and ideas as well as the flexibility of the educational programs. The research interests of the faculty include algorithms and complexity, artificial intelligence and robotics, compilers, distributed and parallel computation, graphics and visualization, operating systems, and programming languages.

The department offers 2 undergraduate degrees: the Bachelor of Arts degree (BA) and the Bachelor of Science in Computer Science degree (BSCS). The department offers 2 master's degrees: the professional Master of Computer Science degree (MCS) and the research-oriented Master of Science degree (MS). The department also offers a doctoral degree (PhD).

A joint MBA/Master of Engineering degree also is available in conjunction with the Jesse H. Jones Graduate School of Management.

**DEGREE REQUIREMENTS FOR BA IN COMPUTER SCIENCE**

For general university requirements, see Graduation Requirements (pages 14–15). The undergraduate program in computer science has been designed to accommodate a wide range of student interests. The program is sufficiently flexible for a student to customize it to his or her interests. A student can develop a broad educational program that couples computer science education with a variety of other fields in engineering, natural sciences, the humanities, or social sciences. Alternatively, a program might be designed for a student preparing for graduate study in computer science or for a career in computing and information technology.

The undergraduate program consists of required core courses, which are introductory courses covering material required of all majors; required breadth courses, which are upper-level courses ensuring knowledge in a broad range of areas; and electives, which give students the freedom to explore specific interests. Students majoring in computer science must complete between 58 and 60 semester hours of courses in these 3 categories. Students graduating with a BA in computer science must have at least 120 semester hours.

**Core Courses**

Eight courses for a total of 28 hours, required for all majors, usually taken in the freshman and sophomore years.

MATH 101/102 *Single Variable Calculus I and II*

COMP 210 *Introduction to Principles of Scientific Computation*

COMP 212 *Intermediate Programming*

COMP 280 *Mathematics of Computer Science*

COMP 314 *Applied Algorithms and Data Structures*

COMP 320 *Introduction to Computer Organization*

**One course from the following:**

MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 221 *Honors Calculus III*

\*Preferred choice



**Breadth Courses**

Seven courses for a total of 24 hours, required for all majors, usually taken in the junior and senior years.

STAT 331\* or 310 *Probability*

CAAM 353 *Numerical Analysis*

MATH 355\* or CAAM 335 *Linear Algebra*

COMP 311 or 412 *Programming Languages*

COMP 481 or 482 *Theory*

COMP 421 *Operating Systems*

ELEC 220 *Computer Engineering Fundamentals*

\* Preferred Choice

**Electives**

Two courses for a total of 6 to 8 hours in computer science at the 300 level or higher. One of these may be an independent study project.

**DEGREE REQUIREMENTS FOR BS IN COMPUTER SCIENCE**

The BS degree is designed for students who are interested in a more in-depth study of computer science to prepare themselves for a professional career in the computing industry. To receive a BS degree, a student must complete all the requirements of the BA degree (i.e., core, breadth, and electives), with the addition of PHYS 101/102 (or PHYS 111/112) (7 hours) to ensure a strong scientific background. In addition, the student must complete the depth component. This component consists of a coherent set of 4 or 5 courses specializing in some area of computer science. The same course cannot satisfy both the breadth requirement and the depth requirement. Students can adopt a preset depth component or design their own components, consisting of at least 15 hours. BS degree plans have to be approved by departmental advisors by no later than the end of the junior year. Sample curricula are listed on the department's website; more information is available from department advisors. The computer science requirements of the BS degree total 80 to 82 semester hours. For a BS degree in computer science, a total of 128 semester hours is required.

**DEGREE REQUIREMENTS FOR MCS AND MS IN COMPUTER SCIENCE**

For general university requirements, see Graduate Degrees (pages 57–58). The professional MCS degree is a terminal degree for students intending to pursue a technical career in the computer industry. To earn the MCS degree, students must successfully complete 30 semester hours of course work approved by the department and following the plan formulated in consultation with the department advisor. In general, the courses must be at the 400 level or above. At least 4 hours must be at the 500 level or above, excluding COMP 590.

Areas of concentration for the MCS include algorithms and complexity, artificial intelligence, compiler construction, distributed and parallel computing, graphics and geometric modeling, operating systems, and programming languages. The professional program normally requires three semesters of study.

The MCS degree with a concentration in bioinformatics is for students intending to pursue a technical career in the biotechnology industry. Students learn to integrate mathematical and computational methods to analyze biological, biochemical, and biophysical data. This program requires prior background in computer science, biosciences, and mathematics. To earn this degree, students must successfully

complete 40 hours of approved course work meeting departmental requirements. This program normally requires 4 semesters of study.

The MS degree is a research degree requiring a thesis in addition to course work.

### DEGREE REQUIREMENTS FOR PHD IN COMPUTER SCIENCE

The PhD degree is for students planning to pursue a career in computer science research and education. The doctoral program normally requires 4 to 6 years of study. To earn a PhD in computer science, students must:

- Meet departmental course requirements
- Complete a COMP 590 project by the end of the 3rd semester
- Complete a master's thesis by the end of the 5th semester, if a previous master's thesis has not been approved by the graduate committee
- Pass a qualifying examination in an area of specialization within 7 semesters after entering the PhD program
- Conduct original research, submit an acceptable PhD thesis proposal, and successfully defend the thesis proposal
- Submit an acceptable PhD thesis that reports research results and pass a final oral defense

Students who successfully meet the 1st 3 requirements are awarded the Master of Science degree. Students successfully meeting all requirements, plus any departmental and university requirements, are awarded the PhD degree.

**Financial Assistance**—Fellowships and research assistantships are available to students in the PhD program. Both provide a monthly stipend for the academic year and cover all tuition expenses. More substantial monthly stipends may be available during the summer for students working on departmental research projects. In all cases, continued support is contingent on satisfactory progress in the program. PhD students also are expected to assist in the teaching and administration of undergraduate and graduate courses.

**Additional Information**—For further information and application materials, write the Department of Computer Science—MS 132, Rice University, P.O. Box 1892, Houston, Texas 77251-1892.

**See COMP in the Courses of Instruction section.**

# EARTH SCIENCE

## THE WIESS SCHOOL OF NATURAL SCIENCES

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 Richard G. Gordon  
 Dale S. Sawyer

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 Adrian Lenardic  
 Andreas Lutge  
 Julia Morgan  
 Colin A. Zelt

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 Cin-Ty Lee  
 Caroline Masiello  
 Fenglin Niu

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 Jeffrey J. Dravis  
 Paul M. Harris  
 Thomas A. Jones  
 Stephen J. Mackwell  
 W. C. Rusty Riese  
 John C. Van Wagoner  
 Fred M. Weaver

### ADJUNCT ASSOCIATE PROFESSOR

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### ADJUNCT ASSISTANT PROFESSORS

Alan D. Brandon  
 Patrick J. McGovern  
 Stephanie S. Shipp  
 Gabor Tari  
 Julia S. Wellner  
 Yitian Xiao

### EARTH SCIENCE RESEARCH

**SCIENTISTS**  
 Rolf Arvidson  
 Glen Snyder

### EARTH SCIENCE LECTURERS

Stephen H. Danbom  
 Alison T. Henning  
 W.C. Rusty Riese

### EARTH SCIENCE POSTDOCTORAL RESEARCH ASSOCIATES

Arnaud Agranier  
 William Hockaday  
 Peter Luffi  
 Meghan Miller  
 Maik Pertermann

### EARTH SCIENCE JOINT APPOINTMENTS (WITH CHEMISTRY)

Andreas Lutge

## ESCI DEGREES OFFERED: BA, BS, MS, PHD

All undergraduate majors in earth science take a 4-course core sequence, typically in the sophomore and junior years, on earth processes, materials, observations, and history. Majors also take a course in geological field techniques and introductory courses in mathematics, chemistry, and in many cases, physics and biology.

The selection of upper-division courses and additional science courses depends on which major, BA or BS, and, for the BS major, which of 5 tracks are chosen by the student: geology, geochemistry, geophysics, environmental earth science, or a track designed by the student subject to the approval of the department undergraduate advisor. The program of study typically includes experience with analytical equipment, computer systems, and fieldwork.

The BS in earth science degree should be chosen by students planning a career or further study in earth science or a related field. The BA in earth science degree has fewer requirements and might be a good choice for students planning a career or further study to which earth science is incidental.

## DEGREE REQUIREMENTS FOR BS IN EARTH SCIENCE

For general university requirements, see Graduation Requirements (pages 14-15).

BS majors must also complete the "Additional Requirements" for one track (described below).

**The following courses are required for all tracks:**

MATH 101/102 *Single Variable Calculus I and II*  
 CHEM 121/122 or 151/152 *General Chemistry I and II with lab*  
 PHYS 101/102 or 111/112 *Introductory Physics I and II with lab*

ESCI 321 *Earth System Evolution and Cycles*  
 ESCI 322 *Earth Chemistry and Materials*  
 ESCI 323 *Earth Structure and Deformation with lab*  
 ESCI 324 *Earth's Interior*  
 ESCI 334 *Geological and Geophysical Techniques*

**ADDITIONAL REQUIREMENTS FOR THE GEOLOGY TRACK****The following courses are required:**

MATH 211 *Ordinary Differential Equations and Linear Algebra*  
 ESCI 390 *Geology Field Camp*

**Choose one of the following courses:**

COMP 110 *Computation in Natural Science*  
 CAAM 210 *Introduction to Engineering Computation*  
 COMP 210 *Principles of Computing and Programming*

**Choose one of the following courses:**

ESCI 412 *Advanced Petrology*  
 ESCI 430 *Principles of Trace-Element and Isotope Geochemistry*

**Choose one of the following courses:**

ESCI 427 *Sequence Stratigraphy*

ESCI 521 *Seminar in Applied Micropaleontology*

**Choose one of the following courses:**

ESCI 504 *Siliciclastic Depositional Systems*  
 ESCI 506 *Carbonate Depositional Systems*  
 ESCI 421 *Paleoceanography*

**Choose one of the following courses:**

ESCI 446 *Solid Earth Geophysics*  
 ESCI 442 *Exploration Geophysics I*

**Choose one of the following courses:**

ESCI 418 *Quantitative Hydrogeology*  
 ESCI 463 *Advance Structural Geology*  
 ESCI 428 *Geologic Interpretation of Reflection Seismic Profiles*  
 ESCI 464 *Global Tectonics*

**ADDITIONAL REQUIREMENTS FOR THE GEOCHEMISTRY TRACK****The following courses are required:**

BIOS 201 *Introductory Biology I*  
 ESCI 390 *Geology Field Camp* or  
 ESCI 391 *Earth Science Field Experience*

**Choose 9 hours from the following:**

ESCI 340 *Global Biogeochemical Cycles*  
 ESCI 412 *Advanced Petrology*  
 ESCI 421 *Paleoceanography*  
 ESCI 425 *Organic Geochemistry*  
 ESCI 458 *Thermodynamics/Kinetics for Geoscientists*  
 ESCI 203 *Biogeochemistry*  
 ESCI 430 *Principles of Trace-Element and Isotope Geochemistry*

**Choose 8 hours from the following:**

All upper division ESCI courses  
 CEVE 401 *Introduction to Environmental Chemistry*

CEVE 403 *Principles of Environmental Engineering*  
 CEVE 434 *Chemical Transport and Fate in the Environment*  
 CEVE 532 *Physical-Chemical Processes in Environmental Engineering*  
 CEVE 534 *Transport Phenomena and Environmental Modeling*  
 CEVE 550 *Environmental Organic Chemistry*  
 BIOS 202 *Introductory Biology*  
 BIOS 211 *Introductory Lab Module in Biological Science*  
 CHEM 211/212 *Organic Chemistry*  
 CHEM 311/312 *Physical Chemistry*  
 CHEM 415 *Chemical Kinetics and Dynamics*  
 CHEM 495 *Transition Metal Chemistry*  
 MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus*  
 COMP 110 *Computation Science and Engineering*  
 CAAM 210 *Introduction to Engineering Computation*

COMP 210 *Introduction to Principles of Scientific Computing*

## ADDITIONAL REQUIREMENTS FOR THE GEOPHYSICS TRACK

**The following courses are required:**

MATH 211 *Ordinary Differential Equations and Linear Algebra*  
 MATH 212 *Multivariable Calculus*  
 PHYS 201 *Waves and Optics*  
 PHYS 231 *Elementary Physics Lab II*  
 ESCI 390 *Geology Field Camp* or  
 ESCI 391 *Earth Science Field Experience*

**Choose one of the following courses:**

COMP 110 *Computation in Natural Science*  
 CAAM 210 *Introduction to Engineering Computation*  
 COMP 210 *Principles of Computing and Programming*

**Choose 6 hours from the following:**

ESCI 418 *Quantitative Hydrogeology*  
 ESCI 440 *Geophysical Data Analysis: Digital Signal Processing*

ESCI 441 *Geophysical Data Analysis: Inverse Theory*  
 ESCI 442 *Exploration Geophysics I*  
 ESCI 444 *Exploration Geophysics II*  
 ESCI 450 *Remote Sensing*  
 ESCI 454 *Geographic Information Science*  
 ESCI 461 *Seismology I*  
 ESCI 462 *Tectonophysics*  
 ESCI 464 *Global Tectonics*  
 ESCI 532 *Advanced Global Tectonics*  
 ESCI 542 *Seismology II*

**Choose 6 hours from the immediately preceding or following lists:**

Any 3- or 4-hour course in ESCI with a number between 411 and 475, except for research and special studies

Any 300- or 400-level MATH, CAAM, or PHYS class  
 CHEM 311 *Physical Chemistry*

## ADDITIONAL REQUIREMENTS FOR THE ENVIRONMENTAL EARTH SCIENCE TRACK

**The following courses are required:**

MATH 211 *Ordinary Differential Equations and Linear Algebra*  
 BIOS 201 *Introductory Biology I*

**Choose one of the following courses:**

COMP 110 *Computation in Natural Science*  
 CAAM 210 *Introduction to Engineering Computation*  
 COMP 210 *Principles of Computing and Programming*

**Choose 11 hours from the following, including at least two courses in ESCI:**

ESCI 340 *Global Biogeochemical Cycles*  
 ESCI 418 *Quantitative Hydrogeology*  
 ESCI 425 *Organic Geochemistry*

ESCI 451 *Analysis of Environmental Data*  
 ESCI 353 *Environmental Geochemistry*  
 ESCI 442 *Exploration Geophysics*  
 ESCI 454 *Geographic Information Science*  
 ESCI 463 *Advanced Structural Geology I*  
 ESCI 504 *Clastics*  
 ESCI 506 *Carbonates*  
 ESCI 568 *Paleoclimates and Human Response*  
 CEVE 306 *Global Environmental Law and Sustainable Development*  
 CEVE 434 *Chemical Transport and Fate in the Environment*  
 CEVE 412 *Hydrogeology and Watershed Analysis*  
 CEVE 401 *Environmental Chemistry*

CHEM 211 *Organic Chemistry*  
 CHEM 311 *Physical Chemistry*  
 CHEM 360 *Inorganic Chemistry*

PHYS 201 *Waves and Optics*  
 PHYS 231 *Elementary Physics Lab II*  
 BIOS 202 *Introductory Biology II*

### ADDITIONAL REQUIREMENTS FOR THE SELF-DESIGNED TRACK

The department recognizes the interdisciplinary nature of modern earth science and the opportunity for students to specialize in nontraditional and emerging fields. Therefore, students can design their own specialty track, normally in close consultation with 1 faculty member and followed by approval from the department's undergraduate advisor. In addition to required earth science courses and related courses, these tracks will generally comprise 12 additional hours that target a coherent theme from an approved list of 300- or higher-level courses, from inside or outside the department. Interested students are expected to submit a statement of rationale by the beginning of their 3rd year.

#### **Choose 9 hours from the following:**

BIOS 201 *Introductory Biology I*  
 COMP 110 *Computation in Natural Science*  
 CAAM 210 *Introduction to Engineering Computation*  
 COMP 210 *Principles of Computing and Programming*  
 CHEM 311/312 *Physical Chemistry I and II*  
 MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus*  
 PHYS 201 *Waves and Optics*  
 PHYS 203 *Atmosphere, Weather, and Climate*  
 ESCI 390 *Geology Field Camp* or  
 ESCI 391 *Earth Science Field Experience*

**Choose 12 hours of additional courses numbered 300 or higher targeting a coherent theme selected with approval of the department undergraduate advisor.**

### DEGREE REQUIREMENTS FOR BA IN EARTH SCIENCE

For general university requirements, see Graduation Requirements (pages 14–15).

#### **The following courses are required:**

MATH 101/102 *Single Variable Calculus I and II*  
 CHEM 121/122 or 151/152 *General Chemistry I and II with lab*  
 ESCI 321 *Earth System Evolution and Cycles*  
 ESCI 322 *Earth Chemistry and Materials*  
 ESCI 323 *Earth Structure and Deformation with lab*  
 ESCI 324 *Earth's Interior*  
 ESCI 334 *Geological and Geophysical Techniques*

#### **Choose 6 hours from the following:**

BIOL 201/202 *Introductory Biology I and II*  
 BIOL 211, 213 *Biology Lab Modules*

MATH 211 *Differential Equations*  
 PHYS 101/102 or 125/126 *Introductory Physics*  
 COMP 110 *Computation in Natural Science* or CAAM 210 *Introduction to Engineering Computation* or COMP 210 *Principles of Computing and Programming*

**Choose 4 upper division ESCI courses, approved by the department undergraduate advisor.**

**Choose 6 hours in science and engineering (including ESCI) courses at the 200 level or above approved by the department undergraduate advisor.**

## UNDERGRADUATE INDEPENDENT RESEARCH

The department encourages, but does not require, earth science undergraduate majors to pursue independent supervised research in ESCI 481 *Research in Earth Science*. See also Honors Programs (page 26).

## DEGREE REQUIREMENTS FOR MS AND PHD IN EARTH SCIENCE

All incoming students should have a strong background in physics, chemistry, and mathematics and should have, or should acquire, a broad grounding in fundamental earth science. The department encourages applications from well-qualified students with degrees in the other sciences and mathematics. For general university requirements, see Graduate Degrees (pages 57–58). The requirements for the MS and PhD in earth science are similar, but the PhD demands a significantly higher level of knowledge, research skills, and scholarly independence. Most students need at least 2 years beyond the bachelor's degree to complete the MS and at least 2 years beyond the MS degree for the PhD.

Candidates determine, with their major professor and thesis committee, a course of study following the *Guidelines for Advanced Degrees in the Department of Earth Science* distributed to all incoming students. For both degrees, candidates must:

- Complete 20 semester hours of course work at the 400 level and above (or other approved courses), not including research hours
- Pass a written preliminary exam
- Maintain a grade point average of 3.00 (B) or better
- Prepare a written thesis
- Produce a publishable thesis that represents an original contribution to science
- Defend the research and conclusions of the thesis in an oral examination

Students of exceptional ability with a bachelor's degree and department approval may work directly toward the PhD, in which case the course of study is equivalent to that required for both degrees; performance on the examinations and the thesis, however, should be at the level required for the PhD. Because the graduate programs require full-time study and close interaction with faculty and fellow students, the department discourages students from holding full (or nearly full) time jobs outside the university. Outside employment must be approved by the chair.

**See ESCI in the Courses of Instruction section.**

# ECONOMICS

## THE SCHOOL OF SOCIAL SCIENCES

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Hervé Moulin

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Bryan W. Brown

James N. Brown

John B. Bryant

Mahmoud El-Gamal

Malcolm Gillis

Simon Grant

Peter Hartley

Peter Mieszkowski

Robin C. Sickles

Ronald Soligo

George R. Zdrow

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Donald L. Huddle

Gordon W. Smith

### ASSOCIATE PROFESSORS

Richard Boylan

Anna Bogomolnaia

Marc Peter Dudey

Vivian Ho

### ASSISTANT PROFESSORS

Camelia Bejan

Juan Carlos Cordoba

Borghana Narajabad

### ADJUNCT PROFESSORS

Bruce M. Lairson

John Michael Swint

### ADJUNCT ASSOCIATE PROFESSOR

Charles E. Begley

### ADJUNCT ASSISTANT PROFESSOR

John Diamond

Kenneth Medlock

### DEGREES OFFERED: BA, MA, PHD

Undergraduates may major in either economics or mathematical economic analysis. The latter is recommended for students who intend to continue on to graduate work in economics or pursue a business or governmental job in which analytical and quantitative skills are required.

The 8 major fields available for graduate study are econometrics, economic development, economic theory, industrial organization and regulation, international trade and finance, labor, macroeconomics and/or monetary theory, and public finance.

### REQUIREMENTS FOR MAJORING IN ECONOMICS

1. All economics majors must complete a minimum of 10 courses with a grade point average of at least 2.0. When students repeat courses or complete more than the minimally required number of courses, the departmental GPA will be based on the set of courses that (i) satisfies all requirements for the degree and (ii) results in the highest GPA for the student. Major requirements are not reduced for multiple majors, although some courses can satisfy the requirements for more than 1 major. (Please note that students may not pursue a double major in economics and mathematical economic analysis.)
2. The following courses are required for all economics majors:

ECON 211 *Principles of Economics I*

ECON 370 *Microeconomic Theory*

ECON 375 *Macroeconomic Theory*

STAT 280 *Elementary Applied Statistics* (or STAT 310/ECON 382)

ECON 446 *Applied Econometrics* (or ECON 400).



Please note that ECON 370 requires MATH 101 (or both MATH 111 and 112) as prerequisites. We suggest that economics majors take ECON 211, ECON 370, MATH 101, STAT 280 (or STAT 310/ECON 382), and ECON 446 (or ECON 400) as early as possible. Please note that failure to take prerequisite courses in earlier years may cause scheduling problems in later years.

3. Given that item 2 has been satisfied, the 5 remaining required economics courses must be selected from the following:

ECON 250 *Foundations of Public Sector Economics*

ECON 340 *Introduction to Game Theory*  
ECON 348 *Organization Design*

ECON 355 *Financial Markets*

ECON 400 *Econometrics*

ECON 403/404 *Senior Independent Research*

ECON 415 *Labor Economics*

ECON 420 *International Trade*

ECON 421 *International Finance*

ECON 435 *Industrial Organization*

ECON 436 *Regulation*

ECON 437 *Energy Economics*

ECON 438 *Business, Law, and Economics*

ECON 439 *Torts, Property, and Contracts*

ECON 440 *Advanced Game Theory*

ECON 445 *Managerial Economics*

ECON 448 *Corporate Finance*

ECON 449 *Basics/Financial Engineering*

ECON 450 *World Economy and Social Development*

ECON 451 *Economy of Latin America*

ECON 452 *Religion, Ethics, and Economics*

ECON 455 *Money and Financial Markets*

ECON 461 *Urban Economics*

ECON 475 *Integer and Combinatorial Optimization*

ECON 477 *Mathematical Economics*

ECON 479 *Applied General Equilibrium Modeling*

ECON 480 *Environmental Economics*

ECON 481 *Health Economics*

ECON 482 *Distributive Justice*

ECON 483 *Public Finance Tax Policy*

ECON 484 *Public Finance Expenditure*

ECON 485/486 *Contemporary Economic Issues*

ECON 495/496 *Senior Seminar*

4. No more than 3 of the 10 economics courses may be transferred from other schools. Additional transfer credits in economics may count toward meeting university graduation requirements but not toward fulfillment of the departmental major requirements. AP credits do not count against the 3 allowed transfer credits. In order to transfer ECON 211, the student must pass a qualifying examination. Students wishing to take the ECON 211 qualifying examination must apply to the economics department office in Baker Hall 266A. For additional information on transfer credits, consult "Procedures for Transfer Credit," available in the economics department office.
5. Students may graduate with honors in economics by achieving a B+ (3.33) average in all economics courses and completing 2 semesters of independent research (for details, consult Economics 403/404—*Senior Independent Research*, available in the economics department office).
6. For additional course information, consult Economics Course Descriptions, compiled by the Rice chapter of the Omicron Delta Epsilon National Economics Honor Society.
7. Please note that it is primarily the responsibility of the student to satisfy all degree requirements, including the University Credit Requirements and University Distribution Requirements specified in the General Announcements. Students are advised that the relevant departmental requirements are those in effect on the day that the student declares economics as their major. Consult with the appropriate departmental advisor, who must sign all registration forms for each major.

8. Students who are considering either graduate work in economics or a business or governmental job in which analytical and quantitative skills are required should seriously consider obtaining the alternative major in mathematical economic analysis.

## REQUIREMENTS FOR MAJORING IN MATHEMATICAL ECONOMIC ANALYSIS

1. The major in mathematical economic analysis (MTEC) is designed for students who are interested in either graduate work in economics or a business or governmental job in which analytical and quantitative skills are required.
2. Students must choose between the 2 majors offered by the economics department; that is, students may not double major in economics and mathematical economic analysis. Major requirements are not reduced for students with multiple majors.
3. All MTEC majors must complete a minimum of 16 courses in 6 areas with a grade point average of at least 2.00. These courses must include:

### **(a) 5 courses in mathematics and statistics**

MATH 101 *Single Variable Calculus I*  
 MATH 102 *Single Variable Calculus II, and*  
 MATH 211 *Ordinary Differential Equations, or*  
 MATH 355 *Linear Algebra, or*  
 CAAM 335 *Matrix Analysis, and*  
 MATH 212 *Multivariable Calculus, or*  
 MATH 221 *Honors Calculus III, and*  
 ECON 382/STAT 310 *Probability and Statistics, or*  
 STAT 410 *Introduction into Regression and*  
*Statistical Computing, or*  
 STAT 431 *Overview of Mathematical Statistics*

### **(b) 1 courses in econometrics:**

ECON 400 *Econometrics*

### **(c) 4 courses in economic theory:**

ECON 211 *Principles of Economics I*  
 ECON 370 *Microeconomic Theory*  
 ECON 375 *Macroeconomic Theory*  
 ECON 477 *Mathematical Structure of Economic Theory*

### **(d) 4 courses in applied economics, selected from:**

ECON 301 *History of Economic Analysis*  
 ECON 348 *Organizational Design*  
 ECON 355 *Financial Markets*  
 ECON 415 *Labor Economics*  
 ECON 420 *International Trade*  
 ECON 421 *International Finance*

ECON 435 *Industrial Organization*  
 ECON 436 *Regulation*  
 ECON 437 *Energy Economics*  
 ECON 438 *Business, Law, and Economics*  
 ECON 439 *Torts, Property, and Contracts*  
 ECON 440 *Advanced Game Theory*  
 ECON 445 *Managerial Economics*  
 ECON 446 *Applied Econometrics*  
 ECON 448 *Corporate Finance*  
 ECON 449 *Basics of Financial Engineering*  
 ECON 450 *World Economic and Social Development*  
 ECON 451 *The Political Economy of Latin America*  
 ECON 452 *Religion, Ethics, and Economics*  
 ECON 455 *Money and Financial Markets*  
 ECON 461 *Urban Economics*  
 ECON 475 *Integer and Combinatorial Optimization*  
 ECON 480 *Environmental and Energy Economics*  
 ECON 481 *Health Economics*  
 ECON 482 *Distributive Justice: A Microeconomic Approach*  
 ECON 483 *Public Finance: Tax Policy*  
 ECON 484 *Public Expenditure Theory and Social Insurance*  
 ECON 485 *Contemporary Economic Issues*  
 ECON 486 *Contemporary Economic Issues*

*(e) 1 semester of ECON 403 or Senior Independent Research*

*(f) 1 additional 400-level course in applied economics as listed in (d) or 1 additional semester of Senior Independent Research (ECON 404) or a course in advanced analysis, selected from:*

*CAAM 452 Numerical Methods for Partial Differential Equations*

*CAAM 453 Numerical Analysis I*

*CAAM 454 Numerical Analysis II*

*CAAM 460 Optimization Theory*

*CAAM 475 Integer and Combinational Optimization*

4. No more than 3 of the required economics courses and 2 of the required mathematics (or computational and applied mathematics or statistics) courses may be transferred from other schools, if those courses are taken after matriculation at Rice. Additional transfer credits in economics, mathematics, computational and applied mathematics, or statistics may count toward meeting university graduation requirements but not toward fulfillment of the departmental major requirements. AP credits and credits awarded to transfer students for courses taken prior to matriculation at Rice are not counted against the limit on transfer courses, but all students must complete more than half of their upper-level major work at Rice. In order to transfer ECON 211, the student must pass a qualifying examination. Students wishing to take the ECON 211 qualifying examination must apply to the economics department office in Baker Hall 259. For additional information on transfer credits, consult "Procedures for Transfer Credit," also available in the economics department office.
5. Students may graduate with "Honors in Mathematical Economic Analysis" by achieving a B+ (3.33) average in the 16 courses required for the major. When students repeat courses or complete more than the minimally required number of courses, the departmental GPA will be based on the set of courses that (i) satisfies all requirements for the degree and (ii) results in the highest GPA for the student. However, when a course is taken both at Rice and at another institution, the Rice grade will be used for departmental GPA calculations.
6. For additional course information, consult "Economics Course Descriptions," compiled by the Rice chapter of the Omicron Delta Epsilon National Economics Honor Society.
7. Please note that it is the responsibility of the student to satisfy all degree requirements, including the university credit requirements and university distribution requirements specified in *General Announcements*. Students are advised that the relevant departmental requirements are those in effect on the day that the student declares mathematical economic analysis as their major. Consult with the appropriate departmental advisor, who must sign all registration forms for each major.

## CONCENTRATION IN BUSINESS ECONOMICS

Students who complete the requirement for a major in economics or a major in mathematical economic analysis also may request a certification from the department that they have completed the requirements for a concentration in business economics if they complete the following courses with minimum grade point average of at least 2.0:

1. ACCO 305 *Introduction to Accounting*
2. The following electives for the economics or mathematical economic analysis major:

ECON 355 *Financial Markets*

ECON 438 *Business, Law, and Economics*

ECON 445 *Managerial Economics*

ECON 448 *Corporate Finance*

Note that to complete their major requirements, economic majors will need to choose 1 additional 400-level elective beyond those chosen to satisfy requirement 2.

**Substituting Economics Graduate Courses for Undergraduate Courses**—Undergraduate majors satisfying the course prerequisites may, subject to the approval of the instructor and of the departmental undergraduate committee chair, substitute certain graduate courses for undergraduate courses. Only highly motivated students with excellent aptitudes for economics and a strong background in mathematics should consider making such substitutions. Typically, but not necessarily, such students will be majors in mathematical economic analysis. Permitted substitutions are as follows:

- ECON 501 for ECON 370 (if student has completed ECON 211 at Rice)
- ECON 502 for ECON 375
- ECON 504 for ECON 382
- ECON 510 for ECON 400
- Furthermore, ECON 505 and ECON 508 also may be taken by undergraduates and may be used toward satisfying MTEC requirements. Specifically, ECON 505 could be used as 1 of the courses in the applied economics category or in the advanced analysis category, while ECON 508 could be used only in the advanced analysis category.

Note that this set of substitutable graduate courses includes 6 of the 7 courses required during the 1st year of the PhD program at Rice. Accordingly, such advanced course work would be excellent preparation for graduate study in economics or in some related field such as finance. Taking such graduate courses also should open more opportunities for the student who will be seeking employment immediately after graduation.

### THE 5-YEAR MA PROGRAM

Advanced undergraduate students can, subject to the approval of the departmental 5-year MA advisor, enter our 5-year MA program. In this program, a student who has taken advantage of the full menu of graduate course substitutions available could, with an additional year of study at Rice, earn an MA in economics.

To obtain the MA degree, students must satisfy all of the requirements for PhD candidacy. In particular, students must pass general examinations in microeconomic theory and in macroeconomic theory and econometrics, must pass an examination in a specialized field of study in economics, and must complete an original research project (a dissertation prospectus) that could be developed into a PhD dissertation under the supervision of a faculty member. This work could be an extension of a paper written as a senior independent research project (ECON 403/404). In some cases, at the discretion of the independent research advisor, the paper produced in ECON 403/404 may fulfill this requirement. Finally, the 1st-year graduate requirement to take ECON 507 Mathematical Economics would be waived with the approval of the departmental 5-year MA advisor.

Note that any student who subsequently decides to enter the economics PhD program at Rice would be given graduate credit for all 500-level economics courses completed while an undergraduate. The completion of the PhD

dissertation typically requires at least 1 additional year of research (but no additional courses) beyond the MA degree.

Students who opt for the 5-year MA degree program will have different backgrounds and interests on entering Rice and will choose to pursue this option at different stages in their academic careers. The following illustrates 2 (of many) possible paths to satisfying the MTEC major requirements, while at the same time completing all of the requirements for the MA degree over a 5-year period.

### COURSES: SAMPLE PATH ONE

The student enters with AP credit for ECON 211 and MATH 101/102 and has an early interest in the 5-year MA program.

#### *Freshman Year*

ECON 370, 375, 477, and MATH 211/212

#### *Sophomore Year*

ECON 501; 1 course from Applied Economics category; and MATH 355 or CAAM 310

#### *Junior Year*

ECON 502, 504, 505, 510, and 1 course from Applied Economics category

#### *Senior Year*

ECON 403/404 and ECON 508

#### *5th Year*

Complete all remaining graduate courses and pass all remaining examinations required to achieve PhD candidacy.

(Note that with AP credit for MATH 101/102, but not for ECON 211, the student could substitute ECON 370 for ECON 211 in the freshman year.)

### COURSES: SAMPLE PATH TWO

The student has no relevant AP credit and/or decides to enter the 5-year MA program only near the end of the sophomore year.

#### *Freshman Year*

ECON 211 and MATH 101/102

#### *Sophomore Year*

ECON 370, 375, 477, and 1 course from applied economics category; MATH 211/212

#### *Junior Year*

ECON 501, 502, 505, 508; MATH 355 or CAAM 310

#### *Senior Year*

ECON 504, 510, 403/404, and 1 course from applied economics category

#### *5th Year*

Complete all remaining graduate courses and pass all remaining examinations required to achieve PhD candidacy.

## DEGREE REQUIREMENTS FOR PHD IN ECONOMICS

**Preparation for PhD Program.** Applicants to the PhD program should have had at least 2 semesters in calculus and 1 in linear algebra. Students who have not met these requirements may complete these prerequisites as Class III students (pages 75–76) before being admitted to the graduate program. All applicants are required to take the Graduate Record Exam.

**Requirements.** For general university requirements, see Graduate Degrees (pages 57–58). Candidates for the PhD degree usually spend from 2 to 2 and 1-half years in full-time course work and at least 1 year writing the dissertation;

4 to 5 years is a reasonable goal for completing the program. For the PhD, students must:

- Complete an approved program of at least 14 courses, not including ECON 593/594 *Workshop in Economics I* and ECON 595/596 *Workshop in Economics II*
- Complete an approved program of at least 4 sections of ECON 593/594 *Workshop in Economics I* and ECON 595/596 *Workshop in Economics II*
- Perform satisfactorily on written general examinations in economic theory and econometrics
- Demonstrate proficiency in a major field by taking the relevant courses in that field and performing satisfactorily on a written examination
- Complete and defend orally a doctoral dissertation setting forth in publishable form the results of original research

**See ECON in the Courses of Instruction section.**

# EDUCATION

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## THE SCHOOL OF HUMANITIES

### **PROFESSOR**

Linda M. McNeil

No degree is offered through the Department of Education. This department offers opportunities for students to explore the background, purposes, and organization of American schools, as well as the major issues facing education today. Research seminars allow students to engage in projects in a wide range of topics significant to education. Most courses require observation in the classroom.

Please see the section on Education Certification for information on the 3 teacher education plans offered at Rice:

1. A secondary teaching certificate in combination with the undergraduate degree in the elected subject field(s)
2. A Master of Arts in Teaching (MAT)
3. A postbaccalaureate plan for Class III students that involves taking those courses and state examinations needed for certification but that does not confer a degree

## EDUCATION CERTIFICATION

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### CHAIR

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### DIRECTOR

Lissa Heckelman

### PROFESSOR

Linda M. McNeil

### ADJUNCT PROFESSOR

Roland B. Smith Jr.

### LECTURERS

Jean Ashmore

Eileen Coppola

Judy Radigan

Carolynne White

### DEGREES OFFERED: SECONDARY TEACHING CERTIFICATE IN CONJUNCTION WITH BA IN MAJOR FIELD, MAT

Students in the teacher education program at Rice show a commitment to teaching, a strong record of scholarship in their subject areas, and promise as thoughtful, engaging teachers. The program emphasizes a sound liberal arts education; extensive knowledge of the subject(s) or area(s) to be taught; professional knowledge, including the relevant historical, philosophical, social, and psychological bases of education; and skills in classroom teaching, which include working with both children and adults. Graduates emerge from the program fully prepared for the teaching profession and knowledgeable about a multitude of teaching styles and methods to meet the needs of the diverse student population in schools today.

Rice offers 3 teacher education plans: (1) a secondary teaching certificate in combination with the undergraduate degree in the elected subject field(s), (2) a Master of Arts in Teaching (MAT), and (3) a postbaccalaureate plan for Class III students that involves taking those courses and state examinations needed for certification but that does not confer a degree. All 3 plans include student teaching in the Rice Summer School for Grades 8–12. While maintaining its academic integrity, the Rice program complies with state of Texas certification requirements. Students seeking additional information about the teacher education program are encouraged to meet with education faculty.

**Texas Teaching Credential**—Rice is approved by the state of Texas to offer teacher preparation programs in the following fields: art, English language arts and reading, French, German, health science technology education, history, Latin, life sciences, mathematics, physical education, physical science, physics/mathematics, science, social studies, and Spanish.

After satisfactory completion of the Rice program, which includes the state-mandated TExES and/or ExCET examinations, students are recommended for a Texas teaching credential. The Texas Education Agency then awards a Texas Standard Teaching Certificate (Grades 8–12).

**Student Teaching—Apprenticeship (Plan A) and Internship (Plan B)** programs are available. Unpaid *apprenticeships* are for undergraduates who wish to complete the teacher education program in 4 years and 2 6-week



summer sessions. Candidates enroll for the summer sessions following their junior and senior years. Apprentices create and teach courses under the supervision of experienced mentor teachers and university faculty in the Rice Summer School for Grades 8–12.

Paid internships are undertaken by Master of Arts in Teaching candidates, some Class III students, and undergraduates who begin earning certification in their senior year. Under this plan, students serve 1 apprenticeship in the Rice Summer School and then are supervised through their 1st semester of a full-time, paid internship in a neighboring, cooperating school system. Permission for the internship is contingent upon completing a successful apprenticeship.

## REQUIREMENTS FOR SECONDARY TEACHING CERTIFICATE

**Admission**—Students may apply to the Rice University Education Certification Office for admission to the teacher education program if they show:

- Attainment of junior standing at Rice (bachelor's degree for MAT and Class III candidates) by the semester of admission to the program
- Grades of C- or better in all semester hours attempted in their teaching field(s) and a grade point average of 2.5 or better, both in courses in their teaching fields and overall
- Evidence of adequate physical vigor to perform as a teacher in a classroom
- Exemption or satisfactory scores on all required preprofessional skills tests

A completed plan of study approved by department representatives and the major field advisor is required before admission to the program is complete.

**Completion of Program**—To complete the program, students must:

- Be exempted from or pass the Texas Higher Education Assessment (THEA) exam prior to enrolling in any education courses
- Complete the courses specified by the major field advisor(s). Lists of courses for each subject are available in the Education Certification Office
- Complete 18 hours in professional education courses as follows:  
 Either EDUC 301/501 *Philosophical, Historical, and Social Foundations of Education* or EDUC 330/530 *The American High School*  
 EDUC 305/505 *Educational Psychology*  
 EDUC 420 *Curriculum Development*  
 3 hours in the appropriate seminar(s) in teaching methods  
 6 hours in student teaching (see following)
- Satisfy a state requirement for computer literacy by completing 3 credits in computer use. EDUC 340 *Computers in Education* is recommended
- Complete all university and program requirements specified for undergraduates, MAT candidates, or nondegree (Class III) candidates
- Make grades of C- or better in all teaching field courses and education courses (B- or better for MAT and Class III students)
- Pass appropriate TExES and/or ExCET exams

**Apprenticeship Plan (Plan A)**

(For students beginning certification in their junior year and for some Class III students)

**Junior Year**

EDUC 301 *Philosophical, Historical, and Social Foundations of Education* or EDUC 330 *The American High School*

EDUC 305 *Educational Psychology*

EDUC 410–416 *Relevant seminar(s) in teaching methods*

EDUC 420 *Curriculum Development*

EDUC 440 *Supervised Teaching: Summer School*

**Senior Year**

EDUC 420 *Curriculum Development*

**After Graduation**

EDUC 440 *Supervised Teaching: Summer School*

**Internship Plan (Plan B)**

(For students beginning certification in their senior year, some Class III students, and MAT students)

**Before Graduation**

EDUC 301/501 *Philosophical, Historical, and Social Foundations of Education* or EDUC 330/530 *The American High School*

EDUC 305/505 *Educational Psychology*

EDUC 410–416 *Relevant seminar(s) in teaching methods*

EDUC 420 *Curriculum Development*

**After Academic Year**

EDUC 440 *Supervised Teaching: Summer School*

EDUC 540 *Internship* (paid internship in the fall in a local, accredited secondary school)

**REQUIREMENTS FOR MAT**

**Admission**—Applicants must have a bachelor's degree, scholarly ability, and an interest in teaching, and they must have taken the Graduate Record Examination (GRE) aptitude test. Education faculty review each application. A limited number of tuition waivers is available. See Admission to Graduate Study (pages 56–57). Admitted students must pass or be exempted from the state's Texas Higher Education Assessment (THEA) exam *prior* to enrolling in any education courses.

**Degree Requirements**—For general university requirements, see Graduate Degrees (pages 57–58). The MAT is a nonthesis degree program for students who want to qualify for secondary school teaching following a liberal arts education. Most candidates entering the program have had no professional education courses. By completing the program, candidates fulfill all requirements for a Texas Standard Teaching Certificate for grades 8–12. To earn the MAT degree, students must complete, with grades of B- or higher, at least 33 semester hours (the need to remove deficiencies may require additional courses for certification) at the graduate level. Requirements are as follows:

- Courses in secondary school educational theory, teaching strategies, educational practice, and evaluation
- Graduate or upper-level courses in the relevant teaching field(s) taken at Rice
- Supervised full-time teaching for 1 summer in the Rice Summer School for Grades 8–12, including design and implementation of courses, teaching, and evaluation
- Approval to begin an internship, based on a successful summer school teaching experience
- Supervised teaching internship for 1 semester in a cooperating secondary school, including the accompanying seminar

The cooperating school districts pay a regular salary for internship teaching, which covers the small cost of graduate tuition.

### **REQUIREMENTS FOR CLASS III CERTIFICATION**

A nondegree (Class III) plan leading to secondary teacher certification is available for those who have earned a BA but do not choose to pursue a graduate degree. Candidates complete all requirements for secondary teacher certification, including professional education courses and courses in their selected fields. Interested students should contact the Education Certification Office.

### **HIGHER EDUCATION ACT TITLE II REPORTS**

The Higher Education Act (HEA) of the U.S. Congress requires each institution of higher education with a teacher preparation program enrolling students receiving federal assistance under this act to report annually to the state and the general public certain information. This information consists of the pass rate of program completers on assessments required by the state for teacher licensure or certification, the statewide pass rate on those assessments, and other basic information on the teacher preparation program.

Rice University's teacher education program is accredited by the state of Texas. The 1st year pass rate for program completers on assessments required by the state for 2004-05 was 100%, compared with 97% for the overall state pass rate. The combined cumulative pass rate for program completers on assessments required by the state for 2003-05 was 100%, compared to 97% for the overall state pass rate. Twenty-six students were enrolled in the program in 2005-06. The students spent an average of 40 hours per week in supervised student teaching with a student/faculty ratio of 2.4-to-1. Rice teacher education program graduates are regularly recruited by school districts in Houston and the surrounding areas because of their innovative ideas, leadership abilities, and dedication to the teaching profession.

**See EDUC in the Courses of Instruction section.**

# ELECTRICAL AND COMPUTER ENGINEERING

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

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Sydney Poland

James B. Sinclair

James D. Wise

### PROFESSOR IN THE PRACTICE

Scott Cutler

The Department of Electrical and Computer Engineering (ECE) strives to provide high-quality degree programs that emphasize fundamental principles, respond to the changing demands and opportunities of new technology, challenge the exceptional abilities of Rice students, and prepare students for roles of leadership in their chosen careers. Undergraduate and graduate programs in ECE offer concentrations in areas that include system and control theory; communications; quantum electronics and lasers; computer systems; and electronic materials, devices, and circuits. The latest information on the department's faculty, research areas, and degree programs and requirements can be found on the ECE website: [www.ece.rice.edu/](http://www.ece.rice.edu/).

### UNDERGRADUATE DEGREE PROGRAMS

The department offers 2 undergraduate degrees, the bachelor of arts (BA) and the bachelor of science in electrical engineering (BSEE). The BA degree provides a basic foundation in electrical and computer engineering that the student can build on to construct a custom program. Because of its flexibility and large number of free electives, the BA can be easily combined with courses from other departments to create an interdisciplinary program. This may be

particularly appropriate for students planning further study in law, business, or medicine.

The BSEE degree is the usual degree taken by those students planning a career in engineering practice. It is accredited by the Accreditation Board for Engineering and Technology (ABET) and can reduce the time required to become a licensed professional engineer. The program for the BSEE requires more hours and greater depth than the BA degree but still provides considerable flexibility.

Both degrees are organized around a core of required courses and a selection of elective courses from 4 specialization areas. Each student's program must contain a depth sequence in 1 area and courses from at least 2 areas to provide breadth. The specialization electives provide a flexibility that can be used to create a focus that crosses traditional areas. Because of the number of options, students should consult early with department advisors to plan a program that meets their needs.

**BSEE Degree Requirements**—See Graduation Requirements (pages 14–15) for general university requirements. A BSEE program must have a total of at least 134 semester hours and include the following courses. A course can satisfy only 1 program requirement, except for design. Students who place out of required courses without transcript credit must substitute other approved courses in the same area. Current degree requirements and planning sheets may be found on the ECE website.

#### **Mathematics and Science Courses**

MATH 101 *Single Variable Calculus I*

MATH 102 *Single Variable Calculus II*

MATH 212 *Multivariable Calculus*

ELEC 331 *Applied Probability*

CAAM 335 *Matrix Analysis* or

MATH 355 *Linear Algebra*

PHYS 101 *Mechanics*

PHYS 102 *Electricity and Magnetism*

ELEC 261 *Electronic Materials and Quantum Devices*

CHEM 121 *General Chemistry*

Additional approved mathematics and science courses to bring the total to 32 hours.

#### **ECE Core Courses**

ELEC 220 *Fundamentals of Computer Engineering*

ELEC 241 *Fundamentals of Electrical Engineering I*

ELEC 242 *Fundamentals of Electrical Engineering II*

#### **Specialization Area Courses**

Upper-level ECE courses are organized into 4 specialization areas: computer engineering, systems, electronic circuits and devices, and quantum electronics. The computer engineering area provides a broad background in computer systems engineering, including computer architecture, digital hardware

ELEC 301 *Introduction to Signals*

ELEC 305 *Introduction to Physical Electronics*

ELEC 326 *Digital Logic Systems*

**Computation Course:** One from

COMP 201 *Principles of Computing and Programming*

CAAM 210 *Introduction to Engineering Computation*

#### **Design Courses**

ELEC 391 *Professional Issues in Electrical Engineering*

ELEC 493 *Senior Design Seminar*

ELEC 494 *Senior Design Laboratory*

One from:

ELEC 424 *Mobile and Imbedded System Design and Applications*

ELEC 432 *Digital Radio System Design*

ELEC 464 *Photonic Sensor System Design*

ELEC 491 *Independent Design Project*

engineering, software engineering, and computer systems performance analysis. The systems area involves the study of processing and communicating signals and information through systems or devices, control theory, signal and image processing, and communications. The electronic circuits and devices area covers the design of analog circuits, electromechanical devices, and the design and manufacturing of semiconductor devices. The quantum electronics area encompasses studies of electronic materials, including nanomaterials, semiconductor and optoelectronic devices, lasers and their applications, and photonics.

The BSEE program must include seven courses total from at least 2 areas, including at least 4 courses in 1 area. Graduate courses and equivalent courses from other departments may be used to satisfy area requirements with permission; consult the ECE website for the latest list of specialization area courses.

### ***Design Requirement***

All BSEE degree candidates must complete a design sequence of 4 courses taken during the junior and senior years. Two required seminars, ELEC 391 (spring, junior year) and ELEC 493 (fall, senior year), provide instruction in professional engineering topics, including ethics, design methodology, project planning, technical presentations, documentation, etc. In the fall semester of the senior year, students can choose any one of the approved design elective courses (see the ECE website for the current list). These courses, except for ELEC 491, provide technical instruction in a subject area and the development of a design project concept in that area. In the spring semester, the required ELEC 494 provides laboratory time in which to actually realize the project. ELEC 491, in conjunction with ELEC 494, provides 2 full semesters for more elaborate projects, including participation in design competitions sponsored by engineering societies. ELEC 491–494 independent design projects require advance approval by the ECE Undergraduate Curriculum Committee.

### ***Unrestricted Electives***

Additional courses to provide the BSEE minimum requirement of at least 134 semester hours.

**BA Degree Requirements**—See Graduation Requirements (pages 14–15) for general university requirements. A BA program must have a total of at least 120 semester hours and include the following courses. A course can satisfy only 1 program requirement, except for laboratory. Students who place out of required courses without transcript credit must substitute other approved courses in the same area. Current degree requirements and planning sheets may be found on the ECE website.

### ***Mathematics and Science Courses***

MATH 101 *Single Variable Calculus I*

MATH 102 *Single Variable Calculus II*

MATH 212 *Multivariable Calculus* or

CAAM 335 *Matrix Analysis*

CAAM 335 *Matrix Analysis* or

MATH 355 *Linear Algebra*

One from: ELEC 331 *Applied Probability*, MATH

355 *Linear Algebra*, MATH 381 *Introduction to*

*Partial Differential Equations* or

CAAM 335 *Matrix Analysis*

PHYS 101 *Mechanics*

PHYS 102 *Electricity and Magnetism*

ELEC 261 *Electronic Materials and Quantum Devices* or CHEM 121 *General Chemistry*

### ***ECE Core Courses***

ELEC 220 *Fundamentals of Computer Engineering*

ELEC 241 *Fundamentals of Electrical Engineering I*

ELEC 242 *Fundamentals of Electrical Engineering II*

ELEC 305 *Introduction to Physical Electronics*

ELEC 326 *Digital Logic Systems*

**Computation Course:** 1 from

CAAM 210 *Introduction to Engineering Computation*

COMP 201 *Principles of Computing and Programming*

**Laboratory:** 1 from

ELEC 201 *Introduction to Engineering Design*

ELEC 327 *Implementation of Digital Systems*

ELEC 342 *Electronic Circuits*

ELEC 433 *Architectures for Wireless Communications*

ELEC 434 *Digital Signal Processing Laboratory*

ELEC 442 *Advanced Electronic Circuits*

ELEC 443 *Power Electronic Circuits*

ELEC 444 *Electromagnetic Interference/Compatibility*

ELEC 445 *Wireless Electronics*

ELEC 465 *Physical Electronics Practicum*

ELEC 494 *Senior Design Seminar*

### **Specialization Area Courses**

Upper-level ECE courses are organized into 4 specialization areas, as described above in the BSEE degree requirements. The BA program must include 4 courses total from at least 2 areas, including at least 2 courses in 1 area. Each course must be at least 3 semester hours. Graduate courses and equivalent courses from other departments may be used to satisfy area requirements with permission; consult the ECE website for the latest list of specialization area courses.

### **Unrestricted Electives**

Additional courses to provide the BA minimum requirement of at least 120 semester hours.

## **GRADUATE DEGREE PROGRAMS**

The ECE department offers two graduate degree programs. The master of electrical engineering (MEE) degree is a course-based program designed to increase a student's mastery of advanced subjects; no thesis is required. The MEE prepares a student to succeed and advance rapidly in today's competitive technical marketplace. A joint MBA/MEE degree is offered in conjunction with the Jesse H. Jones Graduate School of Management. The doctor of philosophy (PhD) program prepares students for a research career in academia or industry. The PhD program consists of formal courses and original research conducted under the guidance of a faculty advisor, leading to a dissertation. Students in the PhD program complete a master of science (MS) degree as part of their program; the ECE department does not admit students for a terminal MS degree.

Information on admission to graduate programs is available from the ECE Graduate Committee and on the ECE website. See the section Information for Graduate Students (page 55) for the general requirements of graduate degrees at Rice. Students must achieve at least a B (3.0) average in the courses counted toward a graduate degree. In addition, no course in which the student earned a grade lower than a C may count toward a graduate degree.

**MEE Degree Requirements**—Students must prepare a MEE degree plan and have it approved by the ECE Graduate Committee. The plan must include at least 30 semester hours of courses, all at the 300 level or above. The program should include a major area of specialization (18 semester hours), a minor area (6 semester hours), plus free electives. At least 7 of the major and minor area courses must be at the 400 level or above, and at least 4 must be at the 500 level or above. ELEC 590 or ELEC 599 may not count as major area courses; no more than 3 semester hours can be transfer credit from another university, and

at most 1 1-hour seminar course may be included in the plan. A MEE degree planning form and current requirements may be found on the ECE website.

**PhD Degree Requirements**—Students are admitted to the PhD program only in the fall semester. ECE PhD students move through the program in stages, starting as 1st-year student, advancing to MS candidate, PhD-qualified student, and PhD candidate; each advancement requires the approval of the ECE graduate committee. Students entering with previous graduate work may follow a hybrid program developed in consultation with the faculty and the graduate committee. The 1st academic year concentrates on foundation coursework and developing a research area. Each student must successfully complete a project, ELEC 599, in his or her chosen area of research in lieu of an oral or written qualifying exam. In addition to enabling the faculty to evaluate the student's research potential, the project encourages timely completion of the MS degree. The student must complete a master's thesis and successfully defend it in an oral examination. Students who already have acquired a master's degree elsewhere still are required to complete a 1st-year ELEC 599 project.

Completion of the MS degree, satisfactory performance in coursework, and a recommendation from the prospective PhD advisor is required for advancement to PhD candidacy. A candidate for the PhD degree must demonstrate independent, original research in electrical and computer engineering. After successfully presenting a PhD research proposal and completion of all coursework, a student is eligible for PhD candidacy. The student then engages in full-time research, culminating in the completion and public defense of the PhD dissertation. Details of the PhD program requirements, the phases of study, and a timetable may be found on the ECE website.

**See ELEC in the Courses of Instruction section for course descriptions.**



# ENGLISH

## THE SCHOOL OF HUMANITIES

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 Jill "Thad" Logan  
 Lisa Slappey  
 Mary L. Tobin

### VISITING ASSISTANT PROFESSOR

Colene Bentley

### PROFESSORS EMERITI

Max Apple  
 Edward O. Doughtie  
 Alan Grob  
 Walter Whitfield Isle  
 John Meixner  
 David Lee Minter  
 William Bowman Piper

## COURSES

Detailed information on current semester course offerings can be found at [www.english.rice.edu](http://www.english.rice.edu). Please note that undergraduate level courses range numerically from ENGL 100 through ENGL 499, and graduate courses begin with ENGL 500. Nonmajors wishing to enroll in upper-level courses (400 and above) are encouraged to consult with the professor prior to enrollment.

## DEGREES OFFERED: BA, PHD

The undergraduate program offers a broad spectrum of courses, including British and American literature, creative writing, women and gender studies, cultural studies, literary theory, media studies, and film. Beyond a critical appreciation of literature, students also will sharpen their written communication and analytical skills. The graduate program in English offers concentrations in all fields of British and American literature and literary theory.

## DEGREE REQUIREMENTS FOR BA IN ENGLISH

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in English must complete 36 semester hours in English with at least 24 hours in courses at the 300 level or above. A double major requires 30 hours in English, with at least 18 hours in the upper-level courses. HUMA 101 and 102 may be counted toward the English major. All English majors must take the following:

- ENGL 200 *Seminar in Literature and Literary Analysis*
- ENGL 300 *Practices in Literary Study*
- 9 hours at the 300 level or above in periods before 1900 A.D.: 6 of the 9 hours must be in periods before 1800 A.D.: but only one may be a Shakespearean course
- 3 hours at the 200 level or above in a course that focuses on noncanonical traditions, such as courses in women, African American, Chicano/a, Asian American, ethnic, global, and diasporic writers

The department recommends that all English majors take courses in British and American history and, if they plan to do graduate work, at least 6 hours of upper-level courses in a foreign language.

### DEGREE REQUIREMENTS FOR PHD IN ENGLISH

For general university requirements, see Graduate Degrees (pages 57–58). As part of their training, graduate students participate in both the teaching and research activities of the department. Upon entering, students will be assigned a Program Advisory Committee (PAC), consisting of 2 or 3 faculty members. In consultation with their PAC, students will design their own individualized program structured by the minimal requirements listed below. For more detailed information, please ask for a copy of the department's program outline.

**MA Program**—The English department does not have an MA program, but offers the MA degree to those PhD students who have achieved candidacy and are in the process of completing the doctorate, and qualified PhD students who leave the program before completing the doctorate. To receive an MA students must:

- Satisfactorily complete at least 30 hours of graduate work in English at Rice University. Courses must be those that count towards the PhD in English. These include courses numbered in the 500s and 600s in the English department excluding 510, 601/602, 603/604; up to 2 approved graduate or equivalent courses taken in other departments; and up to 2 approved courses in the English department numbered 400 and above. Students must satisfactorily complete ENGL 600 and distribution requirements for the PhD (see below).
- Satisfactorily complete 2 teaching assistantships (ENGL 601/602 and 2 research assistantships). These do not count toward the 30-hour requirement.

**PhD Program**—To gain admission to PhD candidacy, students must satisfy the 1st 7 of the following requirements, and they must receive approval for their dissertation prospectus from the department's graduate committee. To earn a PhD in English, candidates also must complete the last 2 requirements. Students must:

1. Satisfactorily complete at least 33 hours of course work plus ENGL 510, exclusive of the thesis. Courses can include: graduate courses in the English department numbered 500 to 600, excluding 510, 601/602, 603/604; up to 2 approved undergraduate courses in the English department; and up to 2 approved courses in another department.
2. Satisfactorily complete the following 2 required courses: ENGL 600 *Professional Methods* and ENGL 605 *Third-Year Writing Workshop*. These count toward the 33-hour requirement.
3. Satisfactorily complete the distribution requirement, which consists of 2 approved courses on literature before 1800 and 2 after 1800. These count toward the 33-hour requirement.

4. Satisfactorily complete the teaching requirement by serving twice as a teaching assistant, completing ENGL 510/511 *Pedagogy*, and teaching a lower-level course designed in conjunction with the instructor of ENGL 510. ENGL 510 does not count toward the 33-hour requirement.
5. Pass a 6-hour written preliminary examination focusing on 2 lists of books: 1 representing the full range of a literary period as defined by the student and his or her preliminary committee, the other representing a 2nd literary period, a single author, a genre traced over a period of time more comprehensive than that covered by the 1st list, or a particular theoretical or critical approach studied with reference to its own history and traditions, as well as to the historical field of the 1st exam.
6. Complete a dissertation prospectus that proposes a topic and an approach, offers a context to the topic in terms of work already done, offers an outline of chapters or sections, and includes a substantial bibliography.
7. Complete a dissertation that demonstrates a capacity for independent and original work of high quality.
8. Pass an oral exam on the dissertation and related fields of study.

**Financial Support**—Within the limits of available funds, qualified students may receive graduate scholarships or fellowships for up to 5 years. To qualify for this continuing financial aid, students must be approved for candidacy for the PhD by the beginning of their 9th semester at Rice.

**See ENGL in the Courses of Instruction section.**

# ENVIRONMENTAL ANALYSIS AND DECISION MAKING

## THE WIESS SCHOOL OF NATURAL SCIENCES

### **DIRECTOR**

Katherine B. Ensor

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Andrew R. Barron

Vicki L. Colvin

Katherine B. Ensor

Matthias Heinkenschloss

Erzsébet Merényi

Dale S. Sawyer

Tayfun E. Tezduyar

### **ASSOCIATE PROFESSOR**

Evan H. Siemann

### **ASSISTANT PROFESSORS**

Dan Cohan

Qilin Li

### **DEGREES OFFERED: MS**

Rice University introduced the professional master's degree in environmental analysis and decision making in fall 2002. This degree is geared to teach students rigorous methods that are needed by industrial and governmental organizations to deal with environmental issues. As an interdisciplinary program, it aims to give students the ability to predict environmental problems, not just solve them. It emphasizes core quantitative topics such as statistics, remote sensing, data analysis, and modeling. In addition, it teaches laboratory and computer skills and allows students to focus their education by taking electives in relevant fields.

The environmental analysis and decision making degree is 1 of 3 tracks in the professional master's program at Rice housed in the Wiess School of Natural Sciences. These master's degrees are designed for students seeking to gain further scientific core expertise coupled with enhanced management and communications skills. These degrees instill a level of scholastic proficiency that exceeds that of the bachelor's level, and they create the cross-functional aptitudes needed in modern industry. Skills acquired in this program will allow students to move more easily into management careers in consulting or research and development, design, and marketing of new science-based products.

### **DEGREE REQUIREMENTS FOR MS IN ENVIRONMENTAL ANALYSIS AND DECISION MAKING**

In addition to the core science courses, students are required to complete a 3-to 6-month internship and take a set of cohort courses focusing on business and communications. At the conclusion of the internship, students must present a summary of their internship project in both oral and written form as part of the professional master's seminar.

Part-time students who already work in their area of study may fulfill the internship requirements by working on an approved project with their current employer. For general university requirements for graduate study, see pages 56-58, and also see Professional Degrees, page 58.

### **ADMISSION**

Admission to graduate study in environmental analysis and decision making is open to qualified students holding a bachelor's degree in a related field that includes general biology, chemistry, calculus, differential equations, and

linear algebra. Department faculty evaluate the previous academic record and credentials of each applicant individually.

### **Science core courses**

CEVE 401 *Introduction to Environmental Chemistry with lab* (F)

ESCI 450 *Remote Sensing* (S)

STAT 685 *Quantitative Environmental Decision Making* (S)

**Plus a single course from each of the following:**

#### **Group A**

ESCI 451 *Analysis of Environmental Data* (F)

STAT 305 *Introduction to Statistics for Biosciences* (F, S)

#### **Group B**

STAT 385 *Methods for Data Analysis* (S)

STAT 410 *Introduction to Statistical Computing and Linear Models* (F)

STAT 421 *Computational Finance II: Time Series Analysis* (S)

STAT 422 *Bayesian Data Analysis* (S)

STAT 509 *Advanced Psychological Statistics I* (F)

#### **Group C**

CEVE 411 *Air Resource Management* (S)

CEVE 412 *Hydrology and Watershed Analysis* (S)

CEVE 434 *Chemical Transport and Fate in the Environment* (F)

CEVE 511 *Atmospheric Chemistry and Physics* (F)

CEVE 550 *Environmental Organic Chemistry* (S)

### **Cohort Courses**

NSCI 610 *Management in Science and Engineering* (F)

NSCI 501 *Professional Master's Seminar* (F, S)  
[required for **two** semesters]

NSCI 511 *Science Policy and Ethics* (S)

NSCI 512 *Professional Master's Project* (F,S)

## **INTERNSHIP**

An internship is conducted under the guidance of a host company, government agency, or national laboratory. A summary of the internship project is required in both oral and written form as part of the professional master's project.

## **ELECTIVE COURSES**

*Note: Each of these electives is not offered every year, and some courses may have prerequisites or require instructor permission.*

Students will choose 5 elective courses, three of which should be from 1 of the focus areas. At least 1 elective should be from the management and policy focus area. Recommended courses include, but are not limited to, the following:

### **Sustainable Development**

BIOS 322 *Global Ecosystem Dynamics* (S)

BIOS 325 *Ecology* (S)

CEVE 406 *Introduction to Environmental Law* (S)

CEVE 411 *Air Resource Management* (S)

CEVE 434 *Chemical Transport and Fate in Environment* (F)

ECON 480 *Environmental Economics* (S)

ESCI 353 *Environmental Geochemistry* (S)

MGMT 617 *Managerial Decision Making* (S)

MGMT 661 *International Business Law* (S)

MGMT 674 *Production and Operations Management* (F)

MGMT 676 *Project Management/Project Finance* (S)

MGMT 721 *General Business Law* (S)

SOCI 367 *Environmental Sociology* (S)

### **Management and Policy**

CEVE 322 *Engineering Economics for Engineers* (F)

- CEVE 406 *Introduction to Environmental Law* (S)  
 ECON 480 *Environmental Economics* (S)  
 NSCI 625 *New Venture Creation in Science and Engineering* (S)  
 MGMT 721 *General Business Law* (S)  
 MGMT 661 *International Business Law* (S)  
 MGMT 617 *Managerial Decision Making* (S)  
 MGMT 674 *Production and Operations Management* (F)  
 MGMT 676 *Project Management/Project Finance* (S)  
 MGMT 636 *Systems Analysis and Database Design*  
 SOCI 367 *Environmental Sociology* (S)

### **Biological Sciences**

- BIOS 322 *Global Ecosystem Dynamics*  
 BIOS 325 *Ecology*  
 BIOS 424 *Microbiology and Biotechnology*  
 BIOS 425 *Plant Molecular Biology* (F)  
 CEVE 536 *Environmental Biotechnology*  
 ESCI 468 *Climate Change and Human Civilization* (S)

### **Chemistry**

- CENG 630 *Chemical Engineering of Nanostructured Materials* (S)  
 CEVE 511 *Atmospheric Chemistry and Physics* (F)  
 CEVE 550 *Environmental Organic Chemistry* (S)  
 ESCI 353 *Environmental Geochemistry* (S)

### **Fluid Dynamics and Transport**

- CENG 571 *Flow and Transport in Porous Media I* (S)  
 CENG 671 *Flow and Transport in Porous Media II* (F)  
 MECH 371 *Fluid Mechanics I* (F)  
 MECH 372 *Fluid Mechanics II* (S)  
 MECH 454/554 *Finite Element Methods in Fluid Mechanics* (F)

### **Engineering**

- CEVE 411 *Air Resource Management* (S)  
 CEVE 434 *Chemical Transport and Fate in the Environment* (F)  
 CEVE 530 *Physical/Chemical Processes in Environmental Engineering* (S)  
 CEVE 640 *Advanced Topics in Environmental Engineering* (F)

### **Advanced Computation**

- CAAM 378 *Introduction to Operations Research and Optimization* (F)  
 CAAM 420 *Computational Science I* (F)  
 CAAM 451 *Numerical Linear Algebra* (F)  
 CAAM 452 *Computational Methods for Differential Equations* (S)  
 CAAM 454 *Optimization Problems in Computational Engineering and Science* (S)  
 ESCI 441 *Geophysical Data Analysis* (F)  
 ESCI 451 *Analysis of Environmental Data* (F)  
 ESCI 454 *Geographic Information Systems* (F)  
 MECH 454/554 *Finite Element Methods in Fluid Mechanics* (F, S)  
 MECH 343 *Modeling of Dynamic Systems* (F)  
 MECH 417/517 *Finite Element Analysis* (S)  
 MECH 420 *Feedback Control of Dynamical Systems* (F)  
 MECH 563/ CAAM 563 *Engineering Approach to Mathematical Programming* (F)  
 MECH 679 / CEVE 679 *Applied Monte Carlo Analysis* (F)  
 STAT 421 *Methods in Computational Finance II* (S)  
 STAT 422 *Bayesian Data Analysis* (S)  
 STAT 431 *Mathematical Statistics* (F)  
 STAT 540 *Practicum in Statistical Modeling* (S)  
 STAT 541 *Multivariate Analysis* (S)  
 STAT 546 *Design and Analysis of Experiments and Sampling Theory*  
 STAT 553 *Biostatistics* (S)

# ENVIRONMENTAL STUDIES

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## **ASSOCIATE DIRECTOR**

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Elizabeth Long

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Kyriacos Zygourakis

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Winifred Hamilton

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Donald Ostdiek

Lisa Slappey

The Environmental Studies Program offers several interdisciplinary courses for students interested in broadening their understanding of environmental issues. These courses often are team-taught by faculty from various areas of study.

Students wishing to major in an environmental program have 3 options: environmental science (see below), environmental engineering sciences (see civil and environmental engineering), or environmental policy (see policy studies). In addition, chemical and biomolecular engineering majors may create a focus area in environmental engineering (see chemical and biomolecular engineering) and earth science majors may follow an environmental earth science track (see earth science).

Students seeking advice regarding environmental programs may contact Andre Droxler, or the coordinator of the Center for the Study of Environment and Society.

## **DEGREE REQUIREMENTS FOR BA IN ENVIRONMENTAL SCIENCE**

Environmental science is an interdisciplinary program that addresses environmental issues in the context of what we know about earth, ecology, and society. In addition to its science core, the major also seeks to provide students with some appreciation of social, cultural, and policy dimensions of environmental issues, as well as exposure to the technologies of pollution control. The double major is designed to accommodate:

- Students wishing to obtain a solid preparation for later graduate study in environmental science or other careers as environmental professionals (e.g., environmental economics or environmental law)
- Students pursuing other careers (e.g., historians, lawyers, mechanical engineers, chemists) who hope to contribute to solutions to one of the major global issues of the 21st Century.

Students may take environmental science *only as a 2nd major*. The 67-semester-hour (minimum) double major may be taken in conjunction with any stand-alone

major offered in any school of the university.

The key components of the double major include:

- Foundation course work in mathematics, physics, chemistry, and biology.
- A set of 5 undergraduate core courses, required of all double majors, that acquaint undergraduates with a range of environmental problems encountered by scientists, engineers, managers, and policy makers. Core courses stress the components of the global environment and their interactions.
- 24 semester hours of environmental electives from 4 categories: 1) social sciences and economics, 2) humanities and architecture, 3) natural sciences, and 4) engineering. Students may petition to have electives, in addition to those currently listed, apply toward the double major.

Major tracking forms are available in the Center for the Study of Environment and Society (CSES) office for declared environmental science majors.

Specific course requirements for a double major (BA) in environmental science include:

#### **General Prerequisites**

BIOS 201 *Introductory Biology*

BIOS 202 *Introductory Biology*

CHEM 121 or 151 *General Chemistry with Laboratory*

CIEM 122 or 152 *General Chemistry with Laboratory*

MATH 101 or 111 *Single Variable Calculus I*

MATH 102 or 112 *Single Variable Calculus II*

PHYS 101 or 125 or 111 *Mechanics*

PHYS 102 or 126 or 112 *Electricity and Magnetism*

#### **Core Courses**

BIOS 325 *Ecology*

ESCI 321 *Earth System Evolution and Cycles*

#### **1 of the following 2 courses**

CEVE 411 *Air Resource Management*

PHYS 203 *Atmosphere, Weather, and Climate*

#### **2 of the following 3 courses**

CEVE 401 *Introduction to Environmental Chemistry*

CEVE 412 *Hydrology and Watershed Analysis*

ESCI 454 *Geographic Information Science*

#### **Advanced Electives (24 hours; at least 6 semester hours from each category)**

##### **Category A—Social Sciences and Economics**

CEVE 306 *Global Environmental Law and Sustainable Development*

CEVE 406 *Environmental Law*

ECON 480 *Environmental and Natural Resource Economics*

ENST 302/UNIV 303 *Environmental Issues: Rice into the Future*

ENST 312 *Environmental Battles in the 21st Century: Houston as a Microcosm*

POLI 317 *Congress*

POLI 331 *Environmental Politics and Policy*

POLI 332 *Urban Politics*

POLI 334 *Political Parties and Interest Groups*

SOCI 313 *Demography*

SOCI 367 *Environmental Sociology*

SOCI 411 *Social Change: Making Sense of Our Times*

##### **Category B—Humanities and Architecture**

ANTH 468/ESCI 468 *Climate Variability and Human Response*

ARCH 313 *Sustainable Architecture*

ARCH 351 *Social Issues and Architecture*

ENGL 367 *American Ecofeminism*

ENGL 368 *Literature and the Environment*

ENST 301/UNIV 300 *Introduction to the Environment: Environmental History and Literature*

##### **Category C—Natural Sciences**

BIOS 316 *Lab Module in Ecology*

BIOS 321 *Animal Behavior*



BIOS 323 *Conservation Biology*  
 BIOS 334 *Evolution*  
 BIOS 336 *Plant Diversity*  
 CHEM 211 *Organic Chemistry*  
 CHEM 395 *Advanced Module in Green Chemistry*  
 ESCI 323 *Earth Structure and Deformation*  
 ESCI 340 *Biogeochemistry*  
 ESCI 421 *Paleoceanography*  
 ESCI 430 *Trace Element and Isotope Geochemistry for Earth and Environmental Sciences*  
 ESCI 442 *Exploration Geophysics*  
 ESCI 450 *Remote Sensing*  
 ESCI 454 *Geographic Information Science*  
 ESCI 468/ANTH 468 *Climate Variability and Human Response*

**Category D—Engineering**

CEVE 201 *Introduction to Environmental Systems*  
 CEVE 203 *Introduction to Environmental Engineering*  
 CEVE 315 *Sustainable Development*

CEVE 401 *Introduction to Environmental Chemistry*  
 CEVE 403 *Principles of Environmental Engineering*  
 CEVE 411 *Air Resources Management*  
 CEVE 412 *Hydrology and Watershed Analysis*  
 CEVE 434 *Chemical Transport and Fate in the Environment*  
 CEVE 451 *Introduction to Transportation*  
 CEVE 470 *Basic Soil Mechanics*  
 CEVE 490 *Undergraduate Research in Environmental Engineering*  
 ENST 307/CEVE 307 *Energy and the Environment*  
 ENST 281/CHBE 281 *Engineering Solutions for Sustainable Communities*  
 STAT 300 *Model Building*  
 STAT 305 *Introduction to Statistics for the Biosciences*  
 STAT 310 *Probability and Statistics*  
 STAT 339/PSYC 339 *Statistical Methods—Psychology*

**See ENST in the Courses of Instruction section.**

# FINANCIAL COMPUTATION AND MODELING

THE GEORGE R. BROWN SCHOOL OF ENGINEERING  
AND THE SCHOOL OF SOCIAL SCIENCES

## DIRECTOR

Katherine B. Ensor

## STEERING COMMITTEE AND UNDERGRADUATE ADVISORS

Mahmoud El-Gamal  
James R. Thompson

## DEGREES OFFERED: NONE

The Departments of Statistics and Economics collaborate to offer Rice undergraduate students a minor in financial computation and modeling (FCAM). The FCAM minor consists of six courses focusing on the strategies and computational technologies used in the financial industry. The minor is designed for those students with strong computational skills and an interest in finance. Many students pursuing the FCAM minor enter careers in the financial industry, either immediately after completion of their undergraduate studies or after graduate studies. Students completing the FCAM minor will understand the complexities of financial markets and their role in and impact on world economies. For the last two decades, this sector of our economy has significantly increased its reliance on quantitative probability based methods in assessing risk and implementing financial strategies; strategies on which our economy depends.

The basic tools component of the FCAM curriculum will equip students with the economic (ECON 211 or ECON 370), probability (STAT 310) and statistical tools (ECON 400 or STAT 410) necessary to pursue the advanced analytical courses. In the advanced courses, students will be exposed to state-of-the-art models and methodologies based on long-standing assumptions about the behavior of financial markets. They also will be exposed to alternative views of market behavior and investment strategies. The goal is to educate students to question basic assumptions as well as utilize and understand technologies based on these important assumptions. In the financial industry, a large suite of solutions are implemented and continually enhanced. A goal of the FCAM program is to train leaders in this industry who not only will understand the financial technologies but also will understand the role, impact, and potential pitfalls of these technologies.

## REQUIREMENTS FOR MINORING IN FCAM

Students take three courses each from two groups

### *Basic Tools (Choose 3)*

ECON 211 or ECON 370  
STAT 310  
ECON 400 or STAT 410

### *Financial Computation and Modeling (Choose 3)*

ECON 355 or ECON 448  
STAT 421  
ECON 449  
STAT 486

# FRENCH STUDIES

## THE SCHOOL OF HUMANITIES

### CHAIR

Jean Joseph Goux

### PROFESSORS

Bernard Aresu

Deborah Nelson-Campbell

### PROFESSOR EMERITA

Madeleine Alcover

### ASSOCIATE PROFESSORS

Deborah A. Harter

Philip R. Wood

### ASSISTANT PROFESSORS

Julie Fette

### DEGREES OFFERED: BA, MA, PHD

Courses in this department hone language skills in French while placing a diverse, generalized knowledge of French literature within a broad spectrum of cultural, historical, philosophical, and theoretical concerns. Students also are urged to take courses in fields closely related to French studies, including European and English history, literature, and philosophy. The department encourages students to spend time studying in a francophone country, and to that end the French studies department and Office of Academic Advising will help students select an appropriate program.

### DEGREE REQUIREMENTS FOR BA IN FRENCH STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in French studies must complete at least 30 semester hours in upper-level courses (at the 300 or 400 level). A double major or an area major must complete 24 hours in upper-level courses.

#### *Required Courses*

FREN 311 *Major Literary Works and Artifacts of Pre-Revolutionary France*

FREN 312 *Major Literary Works and Artifacts of Post-Revolutionary France: The Romantic Legacy*

FREN 336 *Writing Workshop*

#### *Electives*

7 additional courses (for single majors)—at least 3 courses at the 400 level

5 additional courses (for double majors)—at least 2 courses at the 400 level

As many as 2 French courses taught in English may count toward a major in French studies. Students who have taken 300- and 400-level French courses (except those taught in English) cannot enroll simultaneously or afterward in 200-level French courses for credit. More than half of the courses for the major must be taken at Rice University. The department normally requires that the basic courses for the major (FREN 311, 312, and 336) be taken at Rice. Students who matriculate before 2003 may choose to graduate with the requirements listed in the *General Announcements* of the year of their matriculation or of their graduation.

Students with diplomas from French-speaking institutions must consult with the department before enrolling in courses, and all majors and prospective majors must have their programs of study approved by an undergraduate advisor. Students wishing to complete the honors program in French studies also should consult one of the advisors.

**Campus Activities**—To acquaint students with French language and culture, the department sponsors a weekly French table that meets at lunch in a college. The Club Chouette also organizes outings to French movies, sponsors guest lectures, and, in cooperation with the department, helps to produce a play during the spring semester. Students who maintain at least a B average in 2 or more advanced French courses and have a GPA of at least 3.0, are invited to join the Theta chapter of the honorary Pi Delta Phi.

**Travel Abroad**—The department encourages majors to spend time living and studying in a francophone country. The Alliance Française of Houston offers a summer scholarship of \$3,000 each year to a qualified sophomore or junior for 6 weeks of study in France. The Clyde Ferguson Bull Traveling Fellowship is awarded each year to an undergraduate to spend the junior year studying in France with a program approved by the department. Candidates must have taken at least 1 300-level course in the department and have a GPA of at least 3.0. Information about study abroad is available from the department faculty and in the Office of Academic Advising.

### DEGREE REQUIREMENTS FOR MA AND PHD IN FRENCH STUDIES

Admission to graduate study in French, granted each year to a limited number of qualified students, requires a distinguished undergraduate record in the study of French literature or a related field and a capacity for independent work. All candidates should have a near-native command of the French language. For general university requirements, see Graduate Degrees (pages 57–58).

**MA Program**—In most cases, students take 2 years to complete work for the MA degree in French studies. While graduate students normally take 500-level courses, as many as 2 courses at the 400 level may count toward fulfillment of the following course requirements. MA candidates must:

- Complete with satisfactory standing 27 semester hours (in addition to BA course work) of upper-level courses, plus 6 hours of independent study in the preparation of 3 advanced research papers to be defended before their MA committee. The selection of the paper topics must receive preliminary approval from the examination committee.
- Perform satisfactorily on a reading examination in 1 department-approved language other than French or English.
- Perform satisfactorily on preliminary written and oral examinations conducted in French on works specified on the department reading list.

**PhD Program**—Candidates normally take 500-level courses, but students entering with a BA may count toward their PhD degree as many as 3 courses at the 400 level; those entering with an MA may count 2 such courses. Graduate student enrollment in a course listed only at the 400 level, however, is subject to the instructor's approval. Candidates for the PhD degree must meet the following criteria, ensuring that they complete the language requirement and their preliminary exams one year before they submit a dissertation:

- In a program approved by the department, complete with high standing at least 57 semester hours of course work, plus 36 thesis hours (for those already holding an MA degree, the requirement is 39 hours of course work, plus 36 thesis hours). Six of these units may be fulfilled with a 600-level independent study course.
- Satisfactorily complete 1 course at the 300 level or above in a language other than French or English. With the permission of the graduate committee, this requirement also may be met through satisfactory performance on a written

language examination or by such other means as the graduate committee may direct.

- Perform satisfactorily on preliminary written and oral examinations based on readings comprising both required and individually selected texts, including readings in French literature from all major periods and readings in philosophy and theory; history, cultural studies, and film; and postcolonial and gender studies. The oral exam can be taken only after successful completion of the written exam.
- Complete a dissertation, approved by the department, that represents an original contribution to the field of French studies.
- Perform satisfactorily on a final oral examination on the dissertation.

**See FREN in the Courses of Instruction section.**

# GERMAN AND SLAVIC STUDIES

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## THE SCHOOL OF HUMANITIES

### CHAIR

Uwe Steiner

### PROFESSOR

Klaus Weissenberger

### RESEARCH PROFESSOR OF SLAVIC STUDIES

Ewa M. Thompson

### ASSOCIATE PROFESSORS

Christian Emden

Maria-Regina Kecht

Sarah Westphal

### VISITING ASSOCIATE PROFESSOR

Malgorzata Dabrowska

## DEGREES OFFERED: BA IN GERMAN STUDIES, BA IN SLAVIC STUDIES

### GERMAN

The department offers instruction in the German language, in German literature (studied in the original and in translation), and in the achievements of German culture surveyed as a whole and in particular themes, genres, and periods. The department stresses linguistic competence, interdisciplinary study, and the role of German culture within the broad context of European history. Studies in film, cultural theory, and gender complement traditional studies of German literature, philosophy, history, and art.

The BA in German prepares students for graduate study in German and for careers in law, business, international affairs, economics, and other academic fields. Our language acquisition courses maximize linguistic proficiency and prepare students for study abroad. Our freshman seminars are conducted in small groups and stress written and oral communication. Culture courses under the rubric "Mapping German Culture" are taught in English and consider major cultural and literary topics. For students who have some proficiency in German, the Mapping German Culture courses are accompanied by sections that conduct discussions and study sources in German. Upper-level literary courses and special topics seminars both polish linguistic skills and offer intensive study at a high level.

The department encourages study abroad in Germany and Austria. There are weekly German tables in the colleges.

### DEGREE REQUIREMENTS FOR BA IN GERMAN STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). Students who have German as their only major must complete at least 30 semester hours above the 200 level, as follows:

- GERM 303 and 304 (bridge course in German literary/cultural language)
- GERM 410 *Advanced Composition and Conversation: Language and Style in Cultural Texts*
- GERM 411, 412 (basic German literature survey courses)

- 2 special topics seminars (GERM 351 to any other 400-level special topics)
- 3 Mapping German culture courses

Students who have German as a double major must complete at least 24 semester hours above the 200 level, as follows:

- GERM 303 and 304 (bridge course in German literary/cultural language)
- GERM 410 *Advanced Composition and Conversation: Language and Style in Cultural Texts*
- GERM 411, 412 (basic German literature survey courses)
- 1 special topics seminar (GERM 351 to any other 400-level special topics)
- 2 Mapping German culture courses

**Note:** For single majors, a maximum of 4 transfer courses can count toward the major. For double majors, a maximum of 3 transfer courses can count toward the major. Request for exceptions to these rules will be considered by department committee.

**Honors**—Outstanding students are presented annually with the Max Freund Prize. The department also offers an honors program for majors excelling in their studies. Honors work consists of readings and research leading to a substantial honors essay under the supervision of a department faculty member (GERM 403). Students should consider this work to enhance preparation for graduate school.

## SLAVIC

The School of Humanities currently is reviewing the status of the Slavics majors program. At this time, the school is not registering new majors in the Slavics program. The School of Humanities is committed, however, to courses in Russian language, Slavic culture, and East European history, which are expected to be offered next year and in the future.

## DEGREE REQUIREMENTS FOR BA IN SLAVIC STUDIES FOR EXISTING MAJORS

For general university requirements, see Graduation Requirements (pages 14–15). Single majors in Slavic studies must complete 24 semester hours at the 300 level or above. Double majors must complete 18 semester hours at the 300-level or above. At least 1 of these courses must cover the entire Slavic area (e.g., SLAV 320 *Slavic Cultures*, RUSS 411 *Contemporary Russia*, or SLAV 412 *Contemporary Eastern and Central Europe*).

Courses in Polish are offered subject to availability of an instructor. Students may take 2 Slavic studies-related courses from outside the department, subject to approval by the Slavic studies advisor (Ewa M. Thompson).

Currently there is a moratorium on new majors in Slavic Studies, approved by the dean of humanities at the request of the department.

**See GERM, PLSH, RUSS, and SLAV in the Courses of Instruction section.**

# HISPANIC STUDIES

## THE SCHOOL OF HUMANITIES

### CHAIR

TBN

### PROFESSORS

James A. Castañeda

Beatriz González-Stephan

### ASSOCIATE PROFESSORS

Robert Lane Kauffmann

J. Bernardo Pérez

### LECTURER

Juan Carlos Rodriguez

### VISITING PROFESSOR

Vicente Lecuna

## DEGREES OFFERED: BA AND MA IN HISPANIC STUDIES

The department offers courses on the literatures and cultures of the Spanish-speaking nations of the world and on Spanish linguistics. The department stresses linguistic competence, interdisciplinary study, and a transnational perspective on Spanish and Spanish American literature and culture. In addition to courses on the novel, poetry, and the essay, the department also offers the opportunity to study film, art, cultural theory, translation, and gender. Freshman seminars are conducted in English and stress written and oral communication. Qualified students may undertake independent work.

## DEGREE REQUIREMENTS FOR BA IN HISPANIC STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). Both single and double majors must take at least 1 course in Hispanic linguistics, one course in Spanish literature and/or culture, and 1 course in Latin American literature and/or culture. No more than 2 courses taught in English may count toward the major in Hispanic studies. More than half of the courses for the major must be taken at Rice University.

**Single Majors**—Students majoring in Hispanic studies must complete at least 30 semester hours in upper-level courses (SPAN 330 and above) as follows:

- 1 course between SPAN 330-SPAN 359
- 4 courses between SPAN 360-SPAN 399
- 4 courses at the 400 level
- 1 elective course

**Double Majors**—Students double majoring in Hispanic Studies must complete at least 24 semester hours in upper-level courses (SPAN 330 and above) as follows:

- 1 course between SPAN 330-SPAN 359
- 3 courses between SPAN 360-SPAN 399
- 3 courses at the 400 level
- 1 elective course

For a list of recommended elective courses, please see the department coordinator.

**Honors**—Every year, the department presents the Cervantes Award for Outstanding Seniors to its top students. The department also offers to outstanding majors the opportunity to do honors work during their final year of study. Honors work consists of an independent research project leading to a thesis and



is undertaken under the direction of a departmental faculty member. Students wishing to do honors work must submit a thesis proposal to be approved by the department before the end of the semester prior to the semester in which they will register for the honors thesis (SPAN 495).

### **DEGREE REQUIREMENTS FOR MA IN HISPANIC STUDIES**

For general university requirements, see Graduate Degrees (pages 57–58). For the MA degree, candidates must:

- Complete with high standing an approved program that normally includes 27 semester hours in advanced courses, plus 9 hours of thesis work
- Pass a reading examination in 1 foreign language (other than Spanish) that has been approved by the department
- Perform satisfactorily on a written comprehensive examination in Spanish, which tests students' competence in Hispanic literature and linguistics
- Take SPAN 507 *Teaching College Spanish*
- Complete an acceptable thesis
- Perform satisfactorily on a final oral examination on the thesis

**See SPAN in the Courses of Instruction section.**

# HISTORY

## THE SCHOOL OF HUMANITIES

### CHAIR

Martin J. Wiener

### PROFESSORS

John B. Boles

Douglas G. Brinkley

Peter C. Caldwell

Ira D. Gruber

Thomas L. Haskell

Michael Maas

Allen J. Matusow

Atieno Odhiambo

Richard J. Smith

Martin J. Wiener

John H. Zammito

### PROFESSORS EMERITI

Katherine Fischer Drew

Harold Hyman

Gale Stokes

Albert Van Helden

### ASSOCIATE PROFESSORS

Edward L. Cox

Eva Haverkamp

Ussama Makdisi

Carol E. Quillen

Paula A. Sanders

Allison L. Sneider

Lora Wildenthal

### ASSISTANT PROFESSORS

Lisa A. Balabanlilar

Alexander X. Byrd

G. Daniel Cohen

Rebecca A. Goetz

Cyrus C. M. Mody

Kerry R. Ward

### LECTURERS

Karl A. Gunther

Gale L. Kenny

### DEGREES OFFERED: BA, MA, PHD

The undergraduate program offers courses in ancient and medieval history; modern European history; U.S. history; African, Asian, and Caribbean history. Faculty interests range from ancient Greek and medieval Jewish history to modern British and German; from areas in American history that include Colonial America, the Old and New South, the Civil War, and intellectual history; and from general global history to specific areas such as East and South Asian history, Caribbean history, Middle Eastern history, and the history of science and technology. The department encourages its majors to acquaint themselves with other humanistic disciplines, such as literature, fine arts, and philosophy; the contributions of political science, sociology, economics, and anthropology also are vital to historical studies. The graduate program, which trains a limited number of carefully selected students, offers studies in U.S., Europe, Atlantic, and African, and a graduate certificate in the study of women, gender, and sexuality.

### DEGREE REQUIREMENTS FOR BA IN HISTORY

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in history must complete a minimum of 30 semester hours (10 courses) in history. No less than 18 hours (6 courses) should be taken at Rice. No more than 6 hours (2 courses) may be satisfied by advanced placement (AP) credit. Transfer credit, foreign or domestic, when combined with AP, cannot count for more than 12 hours (4 courses). At least 18 hours (6 courses) are required on the 300 or 400 level. Two courses must be chosen from a departmental list of seminars devoted mainly to writing and discussion.

In addition, majors are expected to distribute their 10 courses over 4 fields (AP credit may not be used for these):

Ancient or medieval—1 course minimum

Modern Europe—2 course minimum

United States—2 course minimum

Africa, Asia, Latin America—2 course minimum

Some foreign language proficiency is desirable and the department highly recommends that students contemplating graduate work in history study at least one foreign language in some depth.

**Transfer Credit**—The Department of History grants transfer credit on a case-by-case basis to enrolled undergraduates (the Registrar determines the credit hours). Courses taken at another institution must be the equivalent in required reading, writing, and testing of a Rice history course. It does not have to have an equivalent in the Rice history offerings. For the current procedures to request transfer credit, see the department homepage [history.rice.edu](http://history.rice.edu). Rice students planning to study at a foreign university must also obtain approval from the Office of International Programs.

**Honors Program**—Qualified undergraduates may enroll for 6 semester hours of directed honors research and writing, completing an honors thesis in their senior year (these 6 hours are in addition to the 30 hours required for the major). Application to the program is required. For current procedures, see the department homepage, [history.rice.edu](http://history.rice.edu). Students must complete both semesters of HIST 403 and 404 to receive credit; the grade for the final project applies to the full 6 hours. Limited financial assistance is available to conduct related research during the summer between the junior and senior year for all students accepted into the Honors Program.

## DEGREE REQUIREMENTS FOR MA AND PHD IN HISTORY

The Rice University graduate program in history is primarily a PhD program. Students who have a BA in history (or its equivalent) from an acceptable institution are eligible to apply to the PhD program. Although many successful candidates to the PhD program have an MA or other advanced degree, advanced study is not a requirement for admission. Graduate study is offered in U.S., European, intellectual, and other areas of history. Further information is available on request from the department. For general university requirements, see Graduate Degrees (pages 57-58).

The department awards graduate tuition waivers and fellowship stipends, within the limits of available funds, to qualified PhD candidates with demonstrated ability. University funding is not available for master's program study only. All graduate students in the history department are expected to participate in the professional activities of the department as part of their training. These include, but are not limited to, assisting with the *Journal of Southern History* or the *Papers of Jefferson Davis* and serving as research assistants or teaching assistants for department members. Insofar as possible, these assignments are kept consistent with the interests of the students.

**MA Program**—The department gives priority to applicants for the PhD. Completion of the MA degree usually takes two years; no more than 3 years may elapse between graduate admission and the completion of the degree unless the department graduate committee approves an extension. MA degrees are awarded in two ways: (1) completion of one year of course work (24 credit

hours) and a thesis written and defended in an oral examination during the 2nd year; and (2) completion of 2 years of course work (48 credit hours), normally including at least 2 seminar research papers.

**PhD Program**—Doctoral candidates must prepare themselves in three fields of history: 2 in their major area of concentration, whether European, U.S., or other history, and a 3rd in an area outside of that concentration (e.g., if the major area is European history, the 3rd field must be in U.S. or other non-European history, and if the major area is U.S. history, the third field must be in European or other non-U.S. history, and so on). Students who wish to pursue a 3rd field in an area outside the department should petition the graduate committee by the end of their 2nd semester.

The requirements for completing the degree will be administered as flexibly as possible within the bounds of the general university regulations. These requirements state that the PhD degrees will be awarded after successful completion of at least 90 semester hours of advanced study and an original investigation reported in an approved thesis. Passing the qualifying exam and receiving approval of a dissertation prospectus allows the student to apply for formal admission to candidacy for the PhD degree.

For the PhD, candidates must:

- Prepare themselves thoroughly in 3 examination fields.
- Take 8 graduate seminars, including Introduction to Doctoral Studies.
- Pass an examination in their principal language of research or, if the principal language of research is English, in one other language.
- Perform satisfactorily on written and oral examinations. For students entering with a BA, those examinations normally will be taken before the beginning of the 5th semester and no later than the beginning of the 6th semester. Students entering with an MA may take their examinations earlier, with departmental approval.
- Complete a dissertation presenting the results of original research.
- Defend the thesis in a public oral examination.

**See HIST in the Courses of Instruction section.**

# KINESIOLOGY

## THE SCHOOL OF HUMANITIES

### CHAIR

Nicholas K. Iammarino

### PROFESSOR

Bruce Entyre

### PROFESSORS EMERITI

Eva J. Lee

Hally B. W. Poindexter

Dale W. Spence

### ASSOCIATE PROFESSOR

James G. Disch

### ASSISTANT PROFESSOR

Peter G. Weyand

### PROFESSOR OF THE

### PRACTICE

Clark Haptonstall

### LECTURERS

Rimo Berg

Jason Sosa

Tom Stallings

### PART-TIME LECTURERS

Roberta Anding

Cassius B. Bordelon Jr.

Brian Gibson

Emily Page

Patrick Thornton

### ADJUNCT LECTURERS

Becky Gorham

Mark Jenkins

## DEGREE OFFERED: BA

The department was one of the first of its kind in the nation to institute an academic program structure that allows students to concentrate their efforts on a specific subdiscipline. Academic programs include sports medicine, sport management, and health science. Detailed requirements of each program can be obtained on the departmental webpage at [kinesiology.rice.edu](http://kinesiology.rice.edu).

## DEGREE REQUIREMENTS FOR THE BA IN KINESIOLOGY

For general university requirements, see Graduation Requirements (pages 14–15). A minimum of 120 semester hours is required for a bachelor of arts degree in kinesiology. Because of the interdisciplinary and diverse nature of the field of kinesiology, each student is required to specify an academic program concentration within the major.

## SPORTS MEDICINE PROGRAM

*Advisor: Peter Weyand*

Students who choose the sports medicine program typically continue their education at the graduate level or plan on attending medical school or other medically related professional schools, such as physical therapy. Graduates also may be directly employed in medical and corporate settings, which include both preventative and rehabilitative programs. Graduates who choose not to seek postbaccalaureate education generally are encouraged to obtain certification for exercise testing, physical fitness evaluation, or exercise prescription through the American College of Sports Medicine at [www.acsm.org/](http://www.acsm.org/).

The sports medicine curriculum intends to provide a strong natural science foundation and interface this foundation with application to the human body. Prerequisite courses in chemistry and physics, elective courses in biology and biochemistry, as well as an array of required and elective courses offered within the department provide this foundation. The sports medicine program is the only academic specialization on campus that provides detailed exposure to human anatomy and human physiology. In addition, students receive a solid

foundation in nutrition, biomechanics, sports psychology, motor learning, measurement and statistics, exercise physiology, and sports medicine. Practical experience is afforded through several academic labs. Other elective courses include writing for professional communication, epidemiology, case studies in human performance, motor control, advanced exercise physiology and preventative medicine, research methods, and muscle physiology and plasticity. During advising sessions, students are encouraged to select from these electives according to their respective career goals. Students in the sports medicine program are expected to develop a strong scientific knowledge base as well as adept critical reading, writing, and oral communication skills.

Qualified students of the sports medicine program will be encouraged to participate in an independent study. This independent study allows integral involvement in basic or applied research directed by a faculty advisor. The application (proposal) process for independent studies is outlined on our webpage at [kinesiology.rice.edu/programs.cfm](http://kinesiology.rice.edu/programs.cfm). Qualified students also are encouraged to apply for any 1 of a variety of highly competitive internships. The internships generally provide students with an opportunity to experience the application of preventative and rehabilitative sports medicine concepts and practice in a healthcare or corporate setting.

### **SPORT MANAGEMENT PROGRAM**

*Director: Clark Haptonstall*

Sport management is an interdisciplinary field of study of fairly modern development. It first appeared in the curricula of American universities under a variety of designations in the early to mid-1980s. Rice University became a pioneer institution in developing a sport management major and prides itself in being one of the top programs in the country.

As a distinct body of knowledge and field of study, sport management draws from a wide range of academic disciplines: economics, sociology, political science, psychology, law, communication, and business. Each discipline can be applied to the business enterprise of amateur and professional sport, as well as the management of highly effective teams in sport, corporate America, or other management related professions. While public and private sector sport operation is the topic of a large segment of the curriculum, the thoroughly interdisciplinary emphasis aims to educate students in the skills and theory necessary to assume responsible leadership roles in and out of sport.

Career preparation for leadership and entrepreneurial positions is the ultimate goal of sport management at Rice. Students will acquire a solid academic and practical foundation and thus will be competitive for opportunities at the country's best law and business schools.

Students will complete an internship prior to graduation, often with one of the professional teams in Houston. Networking and out-of-class development play a significant role in obtaining jobs and promotions along high profile career paths such as those in collegiate or professional sports organizations. Membership in national sport societies, specifically the North American Society for Sport Management (NASSM)—the leading academic association in this field and governing body from which Rice is in the process of obtaining national accreditation—is strongly recommended.

Highly qualified students also will be encouraged to seek a minor in business from Rice University's prestigious Jones School of Management.

## HEALTH SCIENCES PROGRAM

*Advisor: Nicholas K. Iammarino*

The goal of the health science program is to provide students with a fundamental background in health promotion and disease prevention. This background will enable them to understand the complexities of maintaining an optimal level of personal health while also considering the role that health promotion plays in society and the mechanisms that affect community health. The health science program is viewed as an excellent option for undergraduate students who are preparing to enter graduate school in health education, health promotion, or public health, as well as other health-related graduate or professional programs, such as medicine or dentistry.

Students must complete a total of 45 semester hours in addition to the general university requirements (see pages 14–15). Seven lecture courses are required for a total of 21 required hours. These required courses include an introductory course designed to acquaint students with the fundamental concepts of health and models of health promotion (Concepts of Health Science), understanding and assessing community health needs (Principles of Community Health), methods of understanding the disease process (Epidemiology), a course that introduces statistics and measurement (Measurement and Statistics), a professional preparation course that introduces students to the profession (Foundations of Health Promotion/Health Education), theories and models commonly used in health promotion research and practice (Theories and Models of Health Behavior), and an application course in which students plan a health promotion program (Planning and Evaluation in Health Promotion/Education).

The remaining 24 semester hours are drawn from elective courses that are both within the kinesiology department and, at present, more than 20 courses from other academic departments. In keeping with the university's interest in an interdisciplinary approach to undergraduate education, this allows students to choose health-related courses within the natural sciences, social sciences, and humanities divisions.

**See HEAL and KINE in the Courses of Instruction section.**

# LEADERSHIP RICE

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## INTERIM DIRECTORS

Natalia Ksiezzyk

Jennifer Murray

**The mission of Leadership Rice** is to help Rice University undergraduates from all disciplines build their leadership capacities to create and manage change effectively. Leadership Rice explores how heart and mind, theory and practice, and ideas and actions come together to facilitate change.

The introductory course, LEAD 309 *Leadership: Theory to Practice* (formerly UNIV 309), is required to apply for participation in the Summer Mentorship Experience and the Leadership Certificate. LEAD 309 is offered only during the fall. Other courses may be taken independently. Leadership Rice's Summer Mentorship Experience places 40 to 50 students each summer in full-time, paid summer mentorships in Houston or nationally. Students are accepted by application between December and February and, if accepted, become part of the Leadership Rice program.

Leadership Rice courses are open to undergraduates from all disciplines:

LEAD 309: *Leadership: Theory to Practice*

LEAD 310: *Leadership Certificate Seminar*

LEAD 311: *Creativity*

HUMA 311: *Leadership Communication*

LEAD 313: *Entrepreneurial Leadership*

PHIL 120: *Ethics of Leadership*

LEAD 409: *Leadership Practicum* (for LEAD 309 teaching assistants)

## THE LEADERSHIP CERTIFICATE:

The program offers a Leadership Certificate for students eager to experience personal growth and reflect deeply on their activities while at Rice. The intention of the certificate is not to have students burdened by doing more but to get more from what they will already be doing. More details about the Leadership Certificate can be found on the Leadership Rice website [www.rice.edu/leadership](http://www.rice.edu/leadership).

Certificate requirements, which can be met in a variety of ways, include:

### ACADEMIC WORK

LEAD 309 (formerly UNIV 309)

Communications

Public policy/leadership theory

Ethics

### EXPERIENTIAL COMPONENTS

Summer work experience

Community service

International experience

Campus engagement



### **CAPSTONE PROJECT**

At the end of the process, certificate students address their understanding of leadership by tackling a “real world” problem, either on campus or beyond. Students are expected to make a public presentation of their work and include documentation in their portfolio.

More information about the program may be found at [www.rice.edu/leadership](http://www.rice.edu/leadership).

# LIBERAL STUDIES

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## THE SUSANNE M. GLASSCOCK SCHOOL OF CONTINUING STUDIES

**DEAN**

Mary B. McIntire

**DIRECTOR**

John W. Freeman

Please refer to the program website [www.mls.rice.edu](http://www.mls.rice.edu) for program information and academic policies.

**DEGREE OFFERED: MASTER OF LIBERAL STUDIES**

The part-time Master of Liberal Studies is an interdisciplinary program founded on the principle that, in an increasingly complex and fragmented world, a liberal arts education becomes all the more important. Though exploring the liberal arts at a highly integrated level is not always possible in a career-focused undergraduate curriculum, it is both possible and well suited to a master's level program designed for committed, energetic adults. Courses in the Master of Liberal Studies program are taught by distinguished Rice faculty and invited visiting faculty who appreciate the opportunity to teach adults.

The program is designed for working adults and does not follow the traditional university schedule of fall and spring semesters. Classes meet 1 evening per week for 10–11 weeks, with 2 or 3 Saturday morning classes. Sessions are offered in the fall, winter, and spring.

Fall classes begin in September and end before Thanksgiving; winter classes begin in January and end in March; spring courses begin in April and end in early June. No classes are held in July or August.

**DEGREE REQUIREMENTS**

For general university requirements for graduate study, see pages 56–58. The MLS program consists of 33 credit hours, which include 3 core courses, 7 electives, and a capstone course. A student may take only 1 course in his or her entering session. The core courses—1 in humanities, 1 in social sciences, and 1 in natural sciences—are designed to acquaint 1st-year students with the contrasting perspectives and methodological approaches that define academic inquiry in the 3 broad fields. Core courses must be completed before electives may be taken. Electives may focus on just 1 “track” (science, social science, or humanities) or may be chosen more broadly. All courses will require research papers; some may require tests or oral presentations.

The capstone course is designed to help students integrate their knowledge through writing an extended paper or completing a project to be presented to MLS faculty and students. A thesis is not part of the degree program. The program can be completed in approximately 4 years if 1 class is completed every session.

**ADMISSION**

Admission to graduate study is open to qualified students holding a bachelor's degree (or equivalent) from an accredited university or college. A minimum GPA of 3.0 from the applicant's undergraduate work is expected, though the admissions committee also gives consideration to applicants' postgraduate experience and recent accomplishments.

**COURSES**

Please refer to the Master of Liberal Studies website for current course listings, [www.mls.rice.edu](http://www.mls.rice.edu).

# LIFETIME PHYSICAL ACTIVITY PROGRAM

## UNDERGRADUATE EDUCATION

### **DIRECTOR**

Dr. Elizabeth Slator

### **INSTRUCTORS**

Mauro Hamza

Elizabeth Harwood

Tracy King

Christine Lidvall

Justin Stafford

Heather Thompson

Rebecca Valls

Historically, Rice University has recognized that becoming physically educated is integral to one's overall education. Since the founding of the university in 1912, the Lifetime Physical Activity Program has worked to create a multifaceted learning experience that promotes the physical, social, and emotional benefits of physical activity. It is the mission of the Lifetime Physical Activity Program to teach both theoretical and practical components of a variety of exercise/performance activities such that they will bring enjoyment and demonstrate the importance of maintaining health and wellness throughout the course of a lifetime.

Specifically, the goals of the Lifetime Physical Activity Program are:

- To encourage a lifetime of fitness through the teaching of mechanical, physiological, and nutritional principles.
- To teach other pertinent knowledge, such as historical and cultural foundations, rules, and strategy.
- To create an environment that fosters a sense of emotional satisfaction, physical accomplishment, and social interaction for its participants.
- To provide students with high-quality instruction specific to the course material so that they may learn skills that will improve the length and quality of their lives.
- To expose students to activities that are not necessarily mainstream in United States culture.

To satisfy the LPAP requirement, students must satisfactorily complete 2 different noncredit LPAP classes. Students with disabilities may make special arrangements to satisfy this requirement. While LPAP courses may not be repeated to meet the graduation requirement, students can repeat a course for credit but should expect to complete additional work in order to receive 1 credit hour. Students will not receive more than 4 hours of credit from the successful completion of LPAP classes.

Lifetime physical activity classes are strongly recommended for all 1st-year students, including transfers who have not taken equivalent courses elsewhere. Because LPAP courses must be supervised by an instructor, students are not allowed to add them after the second full week of classes each semester.

The Lifetime Physical Activity Program offers a variety of sport/exercise/performance activities. In the 40-plus sections that are offered each semester, many have a multisport focus, allowing a student to experience 3 or 4 activities during 1 year. A student may select an LPAP section that meets his/her scheduling needs and that offers activities that satisfy his/her interests. Some of the current activities offered include racquet sports (tennis, racquetball, badminton), fitness activities (group fitness, walk/jog/run, weight training),

aquatic activities, dance (Latin, ballroom, modern, ballet, country western, Middle Eastern, classical Indian), martial arts, and team sports (flag football, basketball, volleyball, soccer, softball) and other activities such as fencing, self-defense for women, golf, yoga, and nutrition.

**See LPAP in the Courses of Instruction section.**

# LINGUISTICS

## THE SCHOOL OF HUMANITIES

### CHAIR

Masayoshi Shibatani

### PROFESSOR

Stephen A. Tyler

### PROFESSORS EMERITI

James E. Copeland

Philip W. Davis

Sydney M. Lamb

### ASSOCIATE PROFESSORS

Michel Achard

Suzanne E. Kemmer

(Undergraduate Advisor)

Nancy Niedzielski

(Graduate Advisor)

Nanxiu Qian

### ASSISTANT PROFESSORS

Claire Bower

(TESOL Program Director)

Katherine Crosswhite

(Speech Sciences Adviser)

Robert Englebretson

(TA Co-ordinator)

## DEGREES OFFERED: BA, MA, PHD

### BA IN LINGUISTICS

The department offers both a major program in linguistics and a Certificate of Teaching English to Speakers of Other Languages, which may be earned with or without a Linguistics major. For general university requirements, see Graduation Requirements (pages 14–15). In addition, students must satisfy the distribution requirements and complete no fewer than 60 semester hours for a total of at least 120 semester hours.

Because human language is a multifaceted object of study, linguistics is, by its nature, an interdisciplinary field. The undergraduate major provides both an in-depth grounding in the field as well as cross-disciplinary breadth. Students beginning a linguistics major should take LING 200, which is a prerequisite for many upper-level courses in the department. All majors are required to take at least 9 courses (27 semester hours) in linguistics at the 300 level or above, including 5 core courses as specified below (or otherwise listed in a particular concentration).

### Core Courses

LING 300 *Linguistic Analysis*

LING 301 *Phonetics*

LING 304 *Introduction to Syntax* or LING 311 *Phonology*

LING 305 *Historical Linguistics*, LING 315 *Introduction to Semantics*, or LING 416 *Language Universals and Typology*

LING 415 *Sociolinguistics* or LING 490 *Discourse*

In addition, competency in 1 language other than English is required. This requirement may be satisfied by 2 courses in a foreign language at the 200 level or above or equivalent or at the 100 level or above for non-European languages. No more than 1 independent study course may be counted toward the major requirements.

Students may elect either a general linguistics major or one of 5 areas of concentration. Options in the list of core courses that are not used as core courses can count as electives for the general major or for concentrations.

The general linguistics major requires, in addition to 5 core courses and the language requirement, at least 4 advanced linguistics electives (300 level or above).

Majors who plan to pursue graduate training in linguistics are recommended to choose 1 of the areas of concentration below. These students also are urged to apply for admission to the Honors Program by the end of their junior year. The requirements for the various concentrations include additional courses as follows:

- **Language Concentration.** In addition to the basic language competency required of all majors, the language concentration requires an advanced level competency in a different language. This can be satisfied by 2 language courses taught in a language other than English at the 300 level or above, or equivalent. In addition to the 5 core courses, 4 advanced electives (300 level or above) also are required, which should be chosen in consultation with the linguistics major advisor. Courses in the structure or the history of the languages studied are especially appropriate.
- **Cognitive Science Concentration.** This concentration requires, in addition to the 5 core courses, 4 advanced linguistics courses focused on the cognitive aspects of human language, selected from LING 306 *Language, Thought, and Mind*, LING 309 *Psychology of Language*, and LING 315 *Introduction to Semantics*, LING 411 *Neurolinguistics*, and LING 490 *Discourse*; and 2 courses from cognitively-related disciplines (psychology, computer science, anthropology, philosophy) as approved by the linguistics major advisor.
- **Language, Culture, and Society Concentration.** For an in-depth grounding in a particular language and culture, this concentration requires 2 language courses at the 300 level or above. The language may be the same as that used to satisfy the basic language competency. Besides the 5 core courses, the student must take 4 courses selected from LING 313 *Language and Culture*, LING 406 *Cognitive Studies*, LING 415 *Sociolinguistics*, LING 419 *Bilingualism*, LING 421 *Sociolinguistics of Spanish*, LING 490 *Discourse*; and 2 courses in sociocultural studies outside the department approved by the linguistics major advisor. Examples of appropriate courses are ANTH 353 *Cultures of India*, ANTH 361 *Latin American Topics*, PSYC 202 *Introduction to Social Psychology*, HIST 250 *Traditional Chinese Culture*, and SOCI 386 *African Americans in Society*.
- **Second Language Acquisition Concentration.** Two language courses at the 300 level or above are required; the language may be the same as that used to satisfy the basic language competency. In addition to the 5 linguistics core courses, 4 additional courses are required, as follows: LING 340 *Theory and Methods of Teaching ESL*; 1 structure of language course (LING 394 *Structure of English* or other language equivalent such as LING 318 *Structure of French*, LING 370 *Structure of Japanese*, etc., as approved by the linguistics major advisor); and any 2 of the following: LING 309 *Psychology of Language*, LING 313 *Language and Culture*, LING 415 *Sociolinguistics*, LING 418 *The Acquisition of L2 Spanish*, LING 419 *Bilingualism*, LING 420 *Cognition and L2 Acquisition*, LING 422 *The Development of Tense and Aspect in Second Language Learning*, and LING 490 *Discourse*.
- **Speech Sciences Concentration.** This concentration is designed for those who would like to pursue career paths in fields related to speech, language, and hearing. Medical-oriented fields under this rubric include speech pathology and audiology; speech technology fields include speech recognition and speech synthesis. The 5 core courses required for this concentration are LING 300 *Linguistic Analysis*, LING 301 *Phonetics*, LING 311 *Phonology*, LING 415 *Sociolinguistics*, and LING 490 *Discourse*. In addition to the core courses, students must take the 2-unit seminar LING 396 *Professions in the Speech Sciences* and 7 other upper-level courses as outlined below:

For students planning careers in medically-oriented fields, the 7 additional courses must include LING 212 *Speech & Hearing Science*, LING 309 *Psychology of Language*, and LING 411 *Neurolinguistics*. Additionally, 4 courses are chosen as follows:

From linguistics one of the following: LING 428 *Laboratory Phonology*, LING 490 *Discourse*, LING 555 *Seminar in Phonetics*, or LING 409 *Special Topics*, when on a topic deemed appropriate by the speech sciences advisor.

From courses outside the department, 3 of the following:

EDUC 310 *Introduction to Special Education*

PSYC 321 *Developmental Psychology*

PSYC 339 *Statistical Methods*

PSYC 351 *Psychology of Perception*

BIOS 122 *Introduction to Biology*

KINE 301 *Human Physiology*

NEUR 511 *Integrative Neuroscience*

For students planning careers in speech technology, the 7 additional courses will include 4 of the following: LING 304 *Introduction to Syntax*, LING 309 *Psychology of Language*, LING 428 *Laboratory Phonology*, LING 490 *Discourse*, LING 555 *Seminar in Phonetics*, or LING 409 *Special Topics*, when on a topic deemed appropriate by the speech sciences advisor. The remaining 3 requirements should be chosen from the following courses from outside the department:

ELEC 301 *Introduction to Signals*

ELEC 434 *Digital Signal Processing Lab*

MECH 373 *Acoustics*

COMP 200 *Elements of Computer Science* or COMP 210 *Principles of Computing*

Further courses in the medical and the language technology areas will enhance students' preparation for these respective fields. Students contemplating careers in the speech sciences should consult with the speech sciences advisor and faculty in other relevant areas concerning course choice and career planning.

**Honors Program.** The Linguistics Honors Program provides selected undergraduate majors with the opportunity to conduct supervised research within their area of specialization in the major. Majors planning to pursue graduate training in linguistics or a related field are strongly encouraged to apply, as well as others who wish to add the experience of an intensive, individualized research project to their undergraduate education.

Application to the Honors Program should be made in person to the undergraduate major advisor before the end of the student's junior year. In support of the application, the student should prepare a brief description of the proposed project signed by the faculty member who is to supervise the work (the project supervisor). Acceptance into the program is by agreement of the linguistics faculty. On acceptance, the student will enroll in LING 482 *Honors Project*, with the supervising faculty member named as instructor.

The Honors Program framework is designed to facilitate the development of a mentoring relationship between student and faculty member. Students are thus expected to meet regularly with their project supervisor regarding their progress; the supervisor is responsible for providing research guidance and general support.

With the appropriate completion of major requirements and the honors project or thesis, the student will graduate with departmental honors.

**Certificate of Teaching English to Speakers of Other Languages.** This program is designed for students who plan to teach English to non-native speakers in the U.S. or abroad. The Certificate of Teaching English to Speakers



of Other Languages (TESOL) supplies undergraduate-level training in applied linguistics and the English language, as well as some practical preparation for English language teaching. It easily can be combined with Linguistics, English, or other majors. To enroll in the program, contact the director of the TESOL Certificate Program, Claire Bowerman.

The program consists of 4 required courses and a practicum.

### Required Courses

LING 200 *Introduction to the Scientific Study of Language*; LING 340 *Theory and Methods of Teaching ESL*; LING 394 *Structure of the English Language*; and 1 of the following:

LING 205 *Language and Society*; LING 300 *Linguistic Analysis*; LING 306 *Language, Thought, and Mind*; LING 309 *Psychology of Language*; LING 313 *Language and Culture*; or LING 415 *Sociolinguistics*.

### Practical Component

The practical component consists of a total of 20 contact hours of language teaching/tutoring experience. This requirement may be filled in a number of ways; see the TESOL information on the linguistics department webpage for further details. On completion of the practicum, a short report on the student's teaching experience should be submitted to the certificate director.

Successful completion of the program must be certified by the director of the TESOL Certificate Program and will be indicated by a certificate of completion, awarded on completion of the Rice BA.

## PHD IN LINGUISTICS

The doctoral linguistics program at Rice emphasizes the study of language use and functional/cognitive approaches to linguistic theory. Rice faculty engage in a broad range of research specializations, all of which play an important role for in-depth graduate training. These interrelated areas include cognitive linguistics, language change, sociolinguistics, discourse analysis, language documentation and description, phonetics, laboratory phonology, and typology. Other faculty research interests include phonological theory, acoustic phonetics, speech sciences and technology, syntax, language revitalization, neurolinguistics, forensic linguistics, applied linguistics, and second language acquisition. The program only admits students planning to study for the PhD degree full time. Undergraduate preparation ideally should include language study and course work in linguistics or disciplines related to linguistics, such as anthropology, applied linguistics, speech and hearing sciences, psychology, sociology, or studies of particular languages, although an advanced degree is not required. A master's degree may be earned during progress to the PhD degree. Admission to the program is competitive. Students admitted to the program are generally offered financial support in the form of tuition scholarships and/or stipends for living expenses.

During the 1st year of residence, each entering student works closely with the graduate advisor to choose a plan of study congruent with the demands of the program and the student's interests. Emphasis throughout the program is on a close working relationship with faculty. Students should select areas of specialization that fit well with faculty research interests and activities.

Students with a master's degree in linguistics will progress through the degree program in 4 years; those without in 5. With no prior linguistics background, course work in the first 3 years will include:

- 1 problem-solving course in linguistic analysis (LING 500) to be taken in the 1st year of study
- 2 courses in the area of phonetics/phonology (LING 501 and 511)

- 2 courses in the area of syntactic/semantic analysis (LING 504 and LING 515 or LING 413)
- the 2-course sequence in field methods (LING 407 and LING 408) to be taken normally in the 2nd year of study
- 2 seminars in the department to be taken in the 2nd and/or 3rd year of study
- 5 additional elective courses, including 2 courses in other subfields of linguistics, for those in the 5-year program; 2 additional electives for those in the 4-year program

Prior preparation in linguistics will be assessed with regard to its equivalence to particular Rice courses. Graduate students are required to register for at least 12 hours credit per semester before advancing to candidacy. All students are expected to serve as teaching assistants for 1 course per year during the time they are receiving departmental support; such service is included in the normal course load.

Before advancing to candidacy, students must prepare 2 in-depth research papers. Each paper must represent a different area in the field of linguistics (as determined by the linguistics faculty); a separate committee of 3 members of the faculty reads and referees each paper. The committees are chosen by the student and approved by the student's faculty mentor. In addition, one of the papers must be presented in the departmental colloquium, and it is expected that students submit their work for presentation at relevant professional meetings and publish their work in venues such as conference proceedings and/or journals when possible.

Finally, students must fulfill the departmental language requirement of competency in at least 2 languages other than English. See the department webpage for specific details.

In the course of the first 3 years in the program, the student should work toward establishing a close working relationship with various members of the faculty such that multiple faculty members are familiar with the student's work. During the 1st year, the graduate advisor serves as the student's advisor, but after the 1st year, the student selects a faculty mentor to provide more personalized advising in addition to the general advice of the graduate advisor. After the student's 2nd paper is accepted, a dissertation advisor is selected and a doctoral committee is formed, by mutual agreement of the student and the anticipated committee members. During the 4th year, students present to their committee members a 3rd research paper, called the dissertation prospectus, consisting of a substantial dissertation proposal and a comprehensive bibliography. This prospectus may take the form of a grant proposal to an external funding agency, particularly in the case of proposed fieldwork. On completion of the prospectus, students will submit to an oral qualifying exam to be administered by the dissertation committee. The exam will consist of 2 parts, a general exam demonstrating the student's knowledge of the field and a dissertation prospectus hearing. On completion of this qualifying examination, the student will advance to candidacy.

Following advancement to candidacy, the student works full time toward the completion of the dissertation. The student is expected to consult regularly with the committee members during the data collection and writing process. After a complete draft of the dissertation is submitted, the student defends the dissertation publicly. When the final version of the dissertation is accepted by the doctoral committee and filed with the university and all other requirements are certified as fulfilled, the degree is then granted.

For more in-depth information about the linguistics graduate program and faculty, consult the departmental web page at [www.linguistics.rice.edu/](http://www.linguistics.rice.edu/).

**See LING in the Courses of Instruction section.**

# MANAGEMENT

## THE JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT

### DEAN

William H. Glick

### ASSOCIATE DEAN OF

#### FACULTY AFFAIRS

Jeff Fleming

### ASSISTANT DEAN OF

#### DEGREE PROGRAMS

Sean Ferguson

### ASSOCIATE DEAN OF

#### EXECUTIVE EDUCATION

William B. Lee

### PROFESSORS

Bala G. Dharan

Jeff Fleming

Jennifer M. George

G. Anthony Gorry

George Kanatas

Vikas Mittal

H. Albert Napier

P. Seethu Seetharaman

Kingshuk Sinha

Ronald N. Taylor

Wilfred C. Uecker

Robert A. Westbrook

Gilbert R. Whitaker, Jr.

Edward E. Williams

Duane Windsor

Stephen A. Zeff

Jing Zhou

### RESEARCH PROFESSORS

Robert Bixby

Marc J. Epstein

### ASSOCIATE PROFESSORS

Shannon W. Anderson

Richard R. Batsell

Steven Currall

Paul Dholakia

Gustavo Grullon

Prashant Kale

Karen K. Nelson

Barbara Ostdiek

Amit Pazgal

Douglas A. Schuler

D. Brent Smith

James P. Weston

Yan Anthea Zhang

### ASSISTANT PROFESSORS

Sharad Borle

Margaret Cording

Steven Crawford

Erik Dane

Nishad Kapadia

Haiyang Li

Evgeny Lyandres

Bradley Paye

Andrew Perkins

Richard A. Price III

Brian R. Roundtree

Siddharth S. Singh

Scott Sonenshein

Shane Underwood

Masahiro Watanabe

Sally K. Widener

Yuhang Xing

### FULL-TIME LECTURERS

Sandra Elliott

Jill Foote

John Kimball Kehoe

Elizabeth O'Sullivan

Rick Schell

David Tobin

Gale Wiley

### ADJUNCT PROFESSORS

John Baker

Marc L. Boom

Barbara White Bryson

Jerry E. Finger

Robert N. Flatt

Blair Garrou

Jack Gill

James Hackett

John K. Hannan

Terry Hemeyer

Ismael Hernandez

William B. Lee

Leo Linbeck III

J. Benton Mayberry

Marise Mikulis

Michael C. Morgan

Armand S. Shapiro

David C. Skinner

David Vance

Atul Varadhachary

Dan Watkins

### PART-TIME LECTURERS

W. Clifford Atherton

John A. Baker

Shannon E. Connell

E. Scott Crist

H. Rad Eanes

John Elsenhans

Nancy Glass

John Hager

Lawrence Hampton

Winford Holland

Vincent Kaminski

Kenny Kurtzman

Robert Lesnick

Shahid Malik

James P. Mandel

Jerlyn Mardis

Connie L. Merrill

Charles Jay Morris

David Mueller

Dennis E. Murphree

Phaedon Papadopoulos

Bobbie Traber

V. Richard Viebig, Jr.

Steven E. Whitney

### COURTESY APPOINTMENTS

Linda Driskill

Mikki Hebl

David Lane

### DEGREES OFFERED: MBA, MBA/MASTER OF ENGINEERING

The Jesse H. Jones Graduate School of Management was established in 1974 through a gift from Houston Endowment, Inc. The school provides its highly select graduate students with unique opportunities for professional training in management. The master of business administration (MBA) program includes

elective offerings in accounting, entrepreneurship, finance, international business, information technology, marketing, operations management, organizational behavior and human resource management, healthcare management, and strategic management and planning.

The MBA from the Jones Graduate School of Management can be obtained via the daytime MBA program, the MBA for Professionals program, or the MBA for Executives program. The Executive and Professional MBA programs are designed for executives and working professionals who do not wish to interrupt their careers while they pursue MBA degrees. The Executive and Professional MBA programs feature similar content and the same faculty as the traditional 2-year MBA program but have a different delivery format. The MBA for Professionals program meets on Monday and Wednesday evenings. The Executive MBA program meets on alternating Friday and Saturdays.

A joint MBA/Master of Engineering degree is offered by the Jones Graduate School of Management and the George R. Brown School of Engineering, in any of the departments of engineering or in statistics. This degree prepares students to become managers in organizations requiring a high level of technical expertise and management skills.

A dual MBA/MD offered by the Jones Graduate School of Management and Baylor College of Medicine prepares students to become both physicians and managers in institutions involved in the delivery of high-quality health care, as well as biotechnology-focused industries, health insurance/managed healthcare firms, and pharmaceutical and medical supply and equipment companies.

Although no undergraduate major is offered, undergraduate accounting courses are available.

#### **ADMISSION REQUIREMENTS FOR JONES GRADUATE SCHOOL**

For general information, see Admission to Graduate Study (pages 56–57). Applicants to the MBA program must submit scores on the Graduate Management Admission Test (GMAT) rather than the Graduate Record Examination (GRE), and, unless they received an undergraduate degree from a U.S. college or university, foreign nationals whose native language is not English must submit recent scores on the Test of English as a Foreign Language (TOEFL). Admission to the Jones Graduate School is open to students regardless of their undergraduate major, but it is highly selective and limited to those who have performed with distinction in their previous academic work and on the GMAT.

**The MBA and MBA for Professionals Program**—Although the MBA and MBA for Professionals programs have not established specific prerequisite courses for admission, students may find it beneficial to have a background that includes undergraduate course work in principles of accounting, principles of microeconomics, and mathematics. Because spreadsheet and word-processing software are used extensively in course work, students should have a thorough understanding of these types of software packages before enrolling.

**MBA for Executives**—In addition to meeting the standards for admission to the other MBA programs, students admitted to the executive program typically have at least 10 years of relevant work experience.

**Joint MBA/Master of Engineering Program**—To enter the dual degree program, applicants must be accepted by both the Jones Graduate School and the engineering department in which they wish to enroll. The program requires the Jones Graduate School application, 3 letters of recommendation, the GRE, and the GMAT. Some engineering departments require advanced tests as well.

**Dual MBA/MD Program**—To enter this dual degree program, applicants must first be accepted by Baylor College of Medicine and apply separately to the Jones Graduate School. The MCAT is accepted rather than the GMAT. Two years of medical school are required before starting MBA classes.

### **DEGREE REQUIREMENTS FOR THE MBA PROGRAM**

The MBA Program requires the completion 60 credits of course work over a two year period. Student must register for 15 credits of course work in all four semesters of residence and are not allowed to take more than 18 credits in any semester. The first year of the program is dedicated to core curriculum coursework; however, students have the option of taking one elective during the second semester of the first year. During the second semester of the first year, students participate in a team based Action Learning Project (ALP) in which they work at a company to solve a specific business problem. This project is the first year capstone learning activity; it allows students to apply and integrate all the management principles learned throughout the first year of the program in a practical setting. The second year of the program is dedicated to elective course work.

**Areas of Interest**— Students have the option of selecting up to 2 functional or professional concentration options. Concentrations include: accounting, entrepreneurship, energy, finance, global business, marketing, management consulting, and mastering creativity and innovation.

All registration and elective selection via drop/add is completed on-line through ESTHER ([esther.rice.edu](http://esther.rice.edu)) and is the responsibility of the student to monitor and maintain his or her schedule and academic record. All schedule changes require the approval of the MBA program assistant director or a designee. The school, which must approve all courses, monitors the student registration process to ensure the correct sequence of required first-year courses for each entering class.

**Waivers and Transfers of Credit**—At its sole discretion, the school may allow students to transfer up to a maximum of 6 credits. This does not necessarily reduce the residence requirement, but it does make additional elective courses available. Students otherwise must follow the prescribed curriculum of study and are not allowed to waive any core requirements.

### **DEGREE REQUIREMENTS FOR THE MBA FOR PROFESSIONALS PROGRAM**

The MBA for Professionals degree requires completion of course work totaling 57 credits. The program is a lock-step progression in which students take required courses in sequence; students take 9 elective courses in their second year in order to fulfill their graduation requirements.

**Areas of Interest**—There are no formal elective concentrations in the MBA for Professionals program. Students may choose one or more areas of interest from among the following: accounting, entrepreneurship, finance, general management, international business, information technology, marketing, operations management, organizational behavior and human resource management, healthcare management, and strategic management and planning. The MBA program director and individual faculty members offer students advice on course selection.

All registration and elective selection via drop/add is completed on-line through ESTHER ([esther.rice.edu](http://esther.rice.edu)) and is the responsibility of the student to monitor and

maintain his or her schedule and academic record. All schedule and changes require the approval of the MBA Program Office. The school, which must approve all courses, monitors the student registration process to ensure the correct sequence of required first-year courses for each entering class.

### **DEGREE REQUIREMENTS FOR THE MBA FOR EXECUTIVES PROGRAM**

This degree requires completion of seven terms and five intensive learning weekends totaling 57 credit hours. Students take the required 1st year courses in lock-step progression and choose nine electives in the second year for a total program time of 22 months.

**Areas of Interest**—There are no formal elective concentrations in the MBA for Executives program. Students may choose one or more areas of interest from among the following: accounting, entrepreneurship, finance, general management, international business, information technology, marketing, operations management, organizational behavior and human resource management, healthcare management, and strategic management and planning. The MBA for Executives program director and individual faculty members offer students advice on course selection.

### **DEGREE REQUIREMENTS FOR JOINT MBA/MASTER OF ENGINEERING**

Students may earn this nonthesis engineering degree in the fields of chemical engineering, civil engineering, computational and applied mathematics, computer science, electrical and computer engineering, environmental science and engineering, mechanical engineering and materials science, and statistics. Ordinarily, the engineering degree takes 1 academic year to complete, whereas the MBA requires 2. Joint-degree candidates, however, can fulfill requirements for both degrees in 2 academic years.

For the joint MBA/master of engineering degree, students must complete:

- At least 2 academic years in residence at Rice
- 63 semester hours in approved course work:
  - 24 hours in an engineering discipline
  - 39 hours in business administration

Students plan their course schedules in consultation with the engineering department in which they are enrolled and with the MBA program director.

### **DEGREE REQUIREMENTS FOR THE DUAL MBA/MD PROGRAM**

Students may earn both MBA and MD degrees in 5 years. They divide their time as follows:

- Years 1 and 2—medical training at Baylor College of Medicine
- Year 3—1st year MBA core courses at Rice, plus a 3 credit healthcare management course in the spring semester. MBA/MD students are required to fill only one custom core class requirement.
- Year 4—MBA courses at Rice, 3 MBA elective credits and 12 credits of healthcare electives during the fall semester, and medical training at Baylor College of Medicine during the spring semester.

Students use the summer between the 3rd and 4th years to perform healthcare research programs or externships. Students receive their

MBA degree from Rice after they have completed 45 hours of approved management course work; they receive their MD degree after they have completed the requirements specified by Baylor College of Medicine.

### **ACADEMIC AND PROFESSIONAL STANDARDS**

Students must meet both academic and professional standards to continue academic work and to graduate. In accepting admission to the MBA degree program, all students agree to be governed by the standards and procedures for dismissal or disciplinary action stated below.

**Academic Standards**—A minimum cumulative grade point average of 3.00 (B) is required for graduation. All courses taken for the MBA degree (including approved courses taken at the university but outside the Jones Graduate School) are counted in the cumulative grade point average calculation.

Students with a cumulative grade point average lower than 3.00 at the end of any semester will be notified of dismissal and may no longer register for courses. A student who has been notified of dismissal may appeal to the Academic Standards Committee of the Jones Graduate School. The committee will decide, based on the circumstances of the appeal, whether the student (1) may resume studies on probation, (2) is to be suspended for 1 semester or an academic year, or (3) is to be dismissed from the MBA program.

Students proposing to return after a period of academic suspension must apply to the Academic Standards Committee and receive permission to be readmitted.

Only grades of C and higher are counted for credit toward graduation. If students receive a grade lower than C in a course required for graduation, they must repeat the course. If students receive a grade lower than C in an elective course, they need not repeat the specific course, but they must make up the hours.

Students may retake a failed course only once and then only if their cumulative grade point average is 3.00 or higher or if they have received the permission of the Academic Standards Committee to do so. Students who fail a course twice will be notified of dismissal. (Students may not take any course for which the failed course is a prerequisite until they pass the prerequisite course.)

Students on academic probation cannot be candidates for student offices, cannot graduate or drop courses, and must complete all future courses with a grade of C or above. Students are removed from probation only upon achieving a cumulative grade point average of at least 3.00 at the end of the following semester of work.

Students who have completed the required number of hours for the MBA degree, the joint MBA/master of engineering degrees or the joint MBA/MD degree, but who have a cumulative grade point average lower than 3.00, are dismissed without graduation. If, in an appeal to the Academic Standards Committee, a student can substantiate a claim of extenuating circumstances, i.e., those beyond the student's control, the student will be permitted to take additional course work at the university within the next year to raise his or her grade point average to 3.00.

Jones School students may not take courses pass/fail to count toward their degree requirements. Jones School students may audit courses with departmental approval. The courses will not count toward the MBA, but will appear on the transcript.

**Professional Standards**—MBA students are held to the high standards of professional conduct expected of managers—standards substantially exceeding those

expected of them simply as students. Students may be dismissed or suspended for failure to meet professional standards, as defined in the University Code of Conduct. The dean may place a student on disciplinary probation for unacceptable conduct, giving oral and written notice that future misconduct will lead to filing of specific charges. (This probationary notice, however, is not required as a precondition for filing specific charges.)

### **GUIDELINES FOR APPEALING ACADEMIC DISMISSAL**

**The Process**—A student who wishes to appeal a dismissal should address the following issues in a letter to the Academic Standards Committee. The student must send the letter to the chairman of the Academic Standards Committee. The following questions should be answered in the appeal letter.

1. What circumstances led to your academic performance last semester and to what degree were those circumstances beyond your control?
2. If your performance in a particular course(s) last semester was below par, describe any circumstances specific to that course that explain your performance.
3. Do you expect the circumstances that created the problems for you last semester to change next semester? If so, how?

You may include any other information that you deem relevant in your appeal letter.

**Timing**—Timing is critical in the appeals process because classes start immediately after the grades are distributed in January. The student must inform the director of the MBA/EMBA/PMBA program (by email or written note) immediately of the intention to appeal. The appeal letter to the committee must be filed expediently, within or sooner than the 1st week of classes. If a student plans to appeal, he/she should attend classes in January without registering. It is important to keep up in his/her studies during the appeal process. If his/her appeal is accepted, the student may register later with a letter from the MBA program office.

Grades are considered final and are rarely changed for any reason other than calculation errors.

**Appeals**—Appeals beyond the Academic Standards Committee must go to the dean of the Jones Graduate School, who may seek guidance from the Dean's Advisory Council. All decisions rendered by the dean are final.

**Confidentiality**—The Family Educational Rights and Privacy Act of 1974 and amendments govern the records of actions related to appeals.

### **GRADE APPEAL PROCESS**

The procedure below outlines the process by which a student may appeal a grade in a course.

1. The student should 1st pursue any grading question with the professor following whatever formal or informal process the professor has outlined for the course.
2. If the matter is not resolved in step 1 above, the student must file a written appeal to the professor and send a copy to the director of the MBA/EMBA/PMBA program. This written appeal must be filed no later than 45 days after the last day of finals for the term (mini-semester) in which the course was offered.
3. The professor must schedule a meeting with the student within 2 weeks of receiving the written appeal to further discuss the appeal with the student.



Notice of the appeal time and date will be provided by the professor to the director of the MBA/EMBA/PMBA program.

4. If step 3 does not resolve the issue to the satisfaction of both parties, the student may appeal to the Dean's Advisory Committee by sending a written notice describing the grounds for the appeal within 2 weeks of the date of the scheduled meeting in step 3.
5. The Dean's Advisory Committee will seek out information on the appeal from the professor and the student and, at its discretion, hold a hearing to further consider the matter. The decision of the Dean's Advisory Committee will be rendered within 6 weeks of receiving a written notice of appeal (step 4).
6. In the event that the protested grade is necessary for the student to graduate, an accelerated schedule will be followed.
7. All decisions rendered by the Dean's Advisory Committee are final.
8. The Family Educational Rights and Privacy Act of 1974 and amendments govern records of these actions.

### **ALP GRADE APPEAL POLICY FOR INDIVIDUAL STUDENT**

The procedure below outlines the process by which an individual student may appeal a grade in the ALP course.

1. The student must send a letter of intent to appeal the grade to the director of ALP. This written appeal must be filed no later than 30 days after the last day of term 4. A copy of the letter must be sent to the director of the MBA program.
2. The director of ALP must schedule a meeting with the student and director of the MBA program by the end of term 1 during the following year to discuss the appeal with the student further. The purpose of the meeting is to review with the student the basis for the individual grade. The director of ALP will provide the meeting time to the director of the MBA program.
3. Up until this time, all information relevant to the case is confidential. If the student desires to talk with the ALP faculty or ALP team members about the matter, this will require the student to waive confidentiality with respect to the matter of the downgrade status. The student must notify the director of ALP about his/her preference to waive confidentiality. Upon receiving the request to waive confidentiality from the student, the director of ALP will apprise all related parties that an appeal is under way, that they are not obligated to discuss the matter with the appealing student, and that their confidential peer evaluations have not been shared with the appealing student. The student must wait for permission from the director of ALP before contacting team members and/or faculty liaisons.
4. If step 2 does not resolve the issue to the satisfaction of both parties, the student may appeal to the director of ALP by sending a written notice describing the grounds for the appeal within 2 weeks of the date of the scheduled meeting in step 2. A copy of the letter must be sent to the director of the MBA program. The director of ALP will render a decision within 3 weeks of receiving the written notice.
5. If step 3 does not resolve the issue to the satisfaction of both parties, the student may appeal to the Dean's Advisory Committee by sending a written notice describing the grounds for the appeal within 2 weeks of the decision rendered by the director of ALP in step 3. A copy of

the letter must be sent to the director of ALP and the director of the MBA program.

6. The Dean's Advisory Committee will seek out information on the appeal from the professor and the student and at its discretion hold a hearing to further consider the matter. The decision of the Dean's Advisory Committee will be rendered within 6 weeks of receiving a written notice of appeal (step 4).
7. All decisions rendered by the Dean's Advisory Committee are final.
8. In the event that the protested grade is necessary for the student to graduate, an accelerated schedule will be followed.
9. The Family Educational Rights and Privacy Act of 1974 and amendments govern records of these actions.

### **ALP GRADE APPEAL POLICY FOR STUDENT TEAM**

The procedure below outlines the process by which an ALP student team may appeal a grade in the ALP course.

1. The student team must send a letter of intent to appeal the grade to all members of the faculty team. This written appeal must be filed no later than 30 days after the last day of term 4. All team members must sign the letter. A copy of the letter must be sent to the director of ALP and to the director of the MBA program.
2. The faculty team must schedule a meeting with the student team by the end of term 1 during the following year to further discuss the appeal with the student team. The professors will provide the meeting time to the director of ALP and to the director of the MBA program.
3. If the matter is not resolved in step 2 above, the student team must file a written appeal to the director of ALP within 2 weeks of the date of the scheduled meeting in step 2. All team members must sign the letter. The director of ALP must schedule a meeting with the student team within 2 weeks of receiving the written appeal to further discuss the appeal with the student team. The director of ALP will provide the meeting date to the director of the MBA program.
4. If step 3 does not resolve the issue to the satisfaction of both parties, the student team may appeal to the Dean's Advisory Committee by sending a written notice describing the grounds for the appeal within 2 weeks of the date of the scheduled meeting in step 3. All team members must sign the letter. A copy of the letter must be sent to the director of ALP and to the director of the MBA program.
5. The Dean's Advisory Committee will seek out information on the appeal from the professors, the director of ALP, and the student team and, at its discretion, hold a hearing to further consider the matter. The decision of the Dean's Advisory Committee will be rendered within 6 weeks of receiving a written notice of appeal (step 4). A copy of the decision must be sent to the director of ALP and to the director of the MBA program.
6. All decisions rendered by the Dean's Advisory Committee are final.
7. In the event that the protested grade is necessary for the student to graduate, an accelerated schedule will be followed.
8. The Family Educational Rights and Privacy Act of 1974 and amendments govern records of these actions.

## DROP/ADD POLICY AND PROCEDURES

Due to the unique term schedule by which the Jones School abides, MBA students have special procedures by which they follow to make schedule changes. The MBA Program Office has implemented an add/drop policy which allows students the opportunity to add/drop elective courses at various times throughout the semester. Below are the procedures for adding or dropping a course and students should contact the Assistant Director of the MBA Program for assistance.

All schedule changes must be approved by the Assistant Director of MBA Program prior to the add/drop deadline (either via email or in person) and before the student makes any schedule changes on ESTHER ([esther.rice.edu/](http://esther.rice.edu/)). All class rosters are updated in the MBA Program Office and sent to professors for enrollment counts and attendance records.

If student is taking a 1.5 CREDIT course:

1. A student may add/drop a class, including section changes for 2nd year core courses, with permission from the Assistant Director of MBA Program by the deadline for the 1.5 credit drop/add period for the appropriate term.
2. A student must attend the 1st class, and may not miss a class during the 1st week.
3. A student may not add or drop a course after the deadline (see add/drop deadlines below for the 2007–08 academic year).

If student is taking a 3 credit course:

1. A student may add/drop a class, including section changes for 2nd year core courses, with permission from the Assistant Director of MBA Program by the deadline for the 3.0 credit drop/add period.
2. A student must attend the 1st class and may not miss a class during the 1st week.
3. A student may not add or drop a course after the deadline.

## 2007–08 ADD/DROP DEADLINES

### *MBA – Fall 2007*

<b>Add/Drop Period</b>	<b>Term(s)</b>	<b>Credits</b>
April 16–October 8, 2007	I & II	3.0
April 16– September 14, 2007	I	1.5
April 16–November 16, 2007	II	1.5
April 16–August 27, 2007	IA	0.75
April 16–November 28, 2007	IB	0.75

### *MBA – Spring 2008*

<b>Add/Drop Period</b>	<b>Term(s)</b>	<b>Credits</b>
November 12–February 25, 2008	III & IV	3.0
November 12–February 4, 2008	III	1.5
November 12–April 7, 2008	IV	1.5

**MBA-P – Fall 2007**

<b>Add/Drop Period</b>	<b>Term(s)</b>	<b>Credits</b>
April 16–August 2, 2007	IX	1.5
April 16–September 14, 2007	X	1.5
April 16–November 16, 2007	XI	1.5
April 16–October 8, 2007	X & XI	3.0

**MBA-P – Spring 2008**

<b>Add/Drop Period</b>	<b>Term(s)</b>	<b>Credits</b>
November 12–February 25, 2008	XII & XIII	3.0
November 12–February 4, 2008	XII	1.5
November 12–April 7, 2008	XIII	1.5

All schedule changes must be submitted and approved by the Assistant Director of MBA Program no later than 5 PM of the add/drop deadline.

**INDEPENDENT STUDY**

**Minimum Hours Requirement**—Each 1-unit credit for independent study should contain approximately as much time content as a 1-credit course at JGSM, which is 12 hours of class time, plus an average of at least 24–36 outside-class hours, for a minimum total of 36–48 hours of work. Independent study projects can be accommodated in increments of 1, 1.5, 2, or 3-unit independent study; 3-unit independent study projects should be less frequent. Credits will be apportioned based on the previously discussed ratio. Occasionally, a group independent study project may arise, though most independent studies will be undertaken by individual students.

The number of credits for an independent study should be negotiated at the beginning of a project. Increases to the number of project credit hours after the project overview has been filed with the MBA program office must be approved by the Academic Standards Committee. The committee will rely on input from sponsoring faculty in making its decision about ex post credit increases. Requests to increase the number of project credit hours must be made before the end of the 2nd week of classes in the term in which the project begins, except when a student is in their last semester, in which case such requests must be made before the end of the 2nd week of the semester.

**Restrictions**—No student may take more than 3 credit hours of independent study during the course of the degree program without the approval of the Academic Committee. If an independent study is proposed that would cause a student to exceed the 3 credit limit, the Academic Standards Committee will select 2 faculty members, other than the faculty member who will supervise the project, within the area most closely related to the study's academic content to review and approve the study. Independent study exceeding 3 credits in total should consider current policies restricting use of independent study as well as the incremental value of additional independent study in light of past independent studies. If the study does not align with any of the JGSM academic groups, the Academic Standards Committee will perform the review and make the final approval decision.

Independent study projects are for academic credit, not for hire. Students may not earn credit for paid research assistance.

**Faculty Sponsorship**—Independent study projects normally are sponsored only by full-time JGSM faculty. Students wishing for sponsorship by a part-time

faculty member must submit a project overview to the Academic Standards Committee and obtain the committee's approval before the term(s) in which the project is to begin.

**Common Requirements**—The goal of independent study projects is to advance or deepen a student's knowledge or competency in a business discipline or activity.

To facilitate these goals, independent study projects generally fall into two broad categories: (1) directed reading and study resulting in a research paper or (2) an experiential or hands-on project resulting in an outcome such as an empirical analysis or a webpage/site with an executive summary of the "deliverable."

While the content of individual independent study projects are at the discretion of a student and the sponsoring faculty member, JGSM would like to ensure relatively equal workloads per unit of independent study credit and some common requirements between independent study projects. To that end, students and/or sponsoring faculty should:

1. Prepare and submit to the MBA program office an overview of the independent study project with number of project credits, anticipated final results, and a broad timeline of anticipated project milestones.
2. Meet to discuss the project, after the initial agreement on the project scope, at least once every 2–3 weeks.
3. Prepare a final paper (in the case of directed reading and research projects) or complete a concrete deliverable (for example, a completed webpage, computer program, survey results, empirical analyses, etc.) together with an executive summary of the project (in the case of experiential projects).
4. File a copy of each student's final paper, or executive summary, with the MBA program office.

**Applications**—Independent study applications are available for interested students to pick up in the MBA program office. Complete and approved applications are due to the MBA program associate by the 1st week of the term in which the project will be completed. The student will be registered for MGMT 700 independent study for the appropriate credit amount, only when the MBA program associate sends the approved application information to the registrar for processing.

### **CLASS ATTENDANCE POLICY**

Students are expected to be in class on the first day of each term. The faculty reserves the right to exclude students from their courses who do not show up on the first day. For special circumstances, see faculty and/or director of MBA program immediately.

### **WITHDRAWAL POLICY**

A Jones School student may voluntarily withdraw from school at any time. Rice University applies a sliding scale to tuition and fees, so early action to withdraw saves money.

### **JONES SCHOOL STUDENT HANDBOOK**

Generally, the Jones School adheres to the academic regulations of Rice University. However, the Jones School has unique policies and procedures that vary from the Office of Graduate and Postdoctoral Studies regarding, but not limited to, leave of absence, withdrawals and readmission, drop/add, academic discipline, dismissal, procedures for resolution of problems, and appeal of academic regulations. All Jones School students are responsible for adhering

to policies and procedures listed in the *Jones School Student Handbook* given to students during preterm. A copy of the handbook also may be obtained from the MBA program office.

#### **FINANCIAL AID**

Financial assistance by the Jones Graduate School is awarded only for a given semester or year. Continuation of assistance depends on satisfactory academic performance, professional behavior, and availability of funds. Academic or disciplinary probation, suspension, or more than 3 grades below B- result in the removal of all forms of school financial assistance, whether scholarship, loan, or employment. Scholarships are awarded for a combination of need and academic merit.

**See ACCO and MGMT in the Courses of Instruction section.**

# MANAGERIAL STUDIES

## THE SCHOOL OF SOCIAL SCIENCES

### PROGRAM DIRECTOR

Richard Boylan

### DEGREE OFFERED: BA

The major in managerial studies is an interdepartmental, nonprofessional program designed to provide undergraduates with an understanding of the environment in which businesses and other organizations exist today and of some of the tools employed by management in the commitment of its financial and human resources. All students taking the managerial studies major also must complete at least 1 of the established departmental or interdepartmental majors, other than an area major. Managerial studies is not the equivalent of an undergraduate business major at other universities.

### DEGREE REQUIREMENTS FOR BA IN MANAGERIAL STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). For the BA degree, students majoring in managerial studies must complete the following 10 core courses in addition to satisfying all the requirements for their 2nd departmental or interdepartmental major:

ACCO 305 *Introduction to Accounting*

ECON 211 *Principles of Economics I*  
(microeconomics)

ECON 448 *Corporation Finance* or ENGI 303  
*Engineering Economics and Management*

\*MANA 404 *Management Communications in  
a Consulting Simulation*

PSYC 101 *Introduction to Psychology*

PSYC 231 *Industrial and Organizational  
Psychology*

\*\*STAT 280 *Elementary Applied Statistics*

\*\*\*STAT 385 *Methods for Data Analysis and  
System Optimization*

2 courses from the following:

ACCO 406 *Management Accounting*

ECON 355 *Financial Markets and Institutions*

ECON 358/POLI 358 *Organizational Design*

ECON 370 *Microeconomics Theory*

ECON 421 *International Finance*

ECON 435 *Industrial Organization*

ECON 437 *Energy Economics*

ECON 438 *Business, Law, and Economics*

ECON 439 *Torts, Property, and Contracts*

MECH 499 *Legal Themes in Engineering Practice*

POLI 335 *Political Environment of Business*

POLI 338 *Policy Analysis*

STAT 420 *Statistical Process Control and  
Experimental Design*

\* MANA 404 is a capstone course that may not be taken until 8 of the 10 other required courses in the major have been completed.

\*\* Psychology and sociology majors may satisfy this requirement with PSYC 339/STAT 339 or SOCI 398, respectively. Students with a calculus background should take STAT 305, STAT 310/ECON 382, or STAT 331/ELEC 331.

\*\*\* or CAAM 378, ECON/STAT 400, STAT 410, 421, 486.

**Honors Program**—To apply for admission to the honors program, students must have completed 8 of the regular managerial studies courses and have a B+ (3.33) average in those courses. All applications must be approved by the director of managerial studies.

The Honors Program consists of taking 2 additional courses from:

MANA 497/498 *Independent Research*

ECON 440 *Advanced Game Theory*

ECON 445 *Managerial Economics*

ECON 449 *Basics of Financial Engineering*

STAT 486 *Methods in Computational Finance  
I: Market Models*

STAT 421 *Methods in Computational Finance  
II: Time Series*

MANA 497/498 are offered in collaboration with faculty in the Jesse H. Jones Graduate School of Management. Admission to these courses must be approved by a participating faculty member. A list of participating faculty and their research interests is available from the director of managerial studies.

For more information, students should consult the program director in 268 Baker Hall.

**See MANA in the Courses of Instruction section.**



# MATHEMATICS

## THE WIESS SCHOOL OF NATURAL SCIENCES

### CHAIR

Michael Wolf

### PROFESSORS

Michael Boshernitzan

Tim D. Cochran

Robin Forman

Robert M. Hardt

Brendan Hassett

John Hempel

Frank Jones

Stephen W. Semmes

William A. Veech

### VISITING PROFESSOR

Günter Stolz

### PROFESSORS EMERITI

F. Reese Harvey

John C. Polking

Rulon S. Wells

### ASSOCIATE PROFESSORS

David Damanik

Zhiyong Gao

### VISITING ASSOCIATE PROFESSOR

Daniel Lenz

### ASSISTANT PROFESSORS

Alexander Bufetov

Shelly Harvey

### INSTRUCTORS

Daniel Cole

Sabin Cautis

Eric Chesebro

Keiko Kawamura

Kelly McKinnie

Rolf Rhyam

Maggy Tomova

## DEGREES OFFERED: BA, MA, PHD

The program in mathematics provides undergraduates with a spectrum of choices, from nontheoretical treatments of calculus and courses in combinatorics, elementary number theory, and projective geometry to a broad variety of sophisticated mathematics, including real and complex analysis, differential geometry, abstract algebra, algebraic and geometric topology, algebraic geometry, dynamics, and partial differential equations.

Faculty research interests range from differential geometry, ergodic theory, group representation, partial differential equations, and probability to real analysis, mathematical physics, complex variables, algebraic geometry, combinatorics, geometric topology, algebraic topology, and dynamics.

## DEGREE REQUIREMENTS FOR BA IN MATHEMATICS

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in mathematics may choose between the regular math major and the double major. Regular math majors must complete:

- MATH 101 and 102 *Single Variable Calculus I and II*
- MATH 211 *Ordinary Differential Equations and Linear Algebra* and MATH 212 *Multivariable Calculus* or MATH 221 and 222 *Honors Calculus III and IV*
- At least 24 semester hours (8 courses) in departmental courses at the 300 level or above (in many instances, the math department will waive the 100- and 200-level courses for a math major)

The requirements for the double major are the same except that students may substitute approved mathematics-related courses for up to 9 of the 24 hours required at the 300 level or above.

Students receive advanced placement credit for MATH 101 by achieving a score of 4 or 5 on the AP AB-level test and for MATH 101 and 102 by achieving a score of 4 or 5 on the BC-level test. Students who have had calculus but have not taken the AP test may petition the department for a waiver of the calculus requirements. Entering students should enroll in the most advanced course commensurate with their background; advice is available from the mathematics faculty during Orientation Week and at other times.

### DEGREE REQUIREMENTS FOR MA AND PHD IN MATHEMATICS

Admission to graduate study in mathematics is granted to a limited number of students who have indicated an ability for advanced and original work. Normally, students take 1 or 2 years after the BA degree to obtain an MA degree, and they take 4 or 5 years to obtain a PhD. An MA is not a prerequisite for the PhD. For general university requirements, see Graduate Degrees (pages 57–58).

A number of graduate scholarships and fellowships are available, awarded on the basis of merit. As part of the graduate education in mathematics, students also engage in teaching or other instructional duties, generally for no more than 6 hours a week.

**MA Program**—Candidates for the MA in mathematics must:

- Complete with a grade of B or better a course of study approved by the department (students may transfer credits from another university only with the approval of both the department and the University Graduate Council)
- Perform satisfactorily on an examination in at least 1 approved foreign language (French, German, or Russian)
- Either complete all requirements for qualification as a candidate for the PhD (see below) or present and provide an oral defense of an original thesis acceptable to the department

**PhD Program**—Candidates for the PhD in mathematics must:

- Complete with a grade of B or better a course of study approved by the department (students may transfer credits from another university only with the approval of both the department and the University Graduate Council)
- Perform satisfactorily on qualifying examinations (see below)
- Perform satisfactorily on examinations in 1 approved foreign language (French, German, or Russian)
- Write an original thesis acceptable to the department
- Perform satisfactorily on a final oral examination on the thesis

**Qualifying Examinations**—The qualifying examinations in mathematics consist of the general examinations and the advanced oral examination.

To complete the **general examinations**, students must take exams, 1 each in algebra, analysis, and topology. Exams are offered every August and January. First-year students may take any combination of exams at any time. After 2 semesters of study, students must attempt to pass all remaining exams at each offering. Students must perform satisfactorily on all 3 by the start of their 5th semester. Students may take an exam several times.

To complete the **advanced oral examination**, students must select a special field (e.g., homotopy theory, several complex variables, or group theory) and submit it to the department graduate committee for approval. The committee schedules an advanced examination in the selected field, normally 6 to 9

months after the student completes the general examinations. While students failing the advanced examination may, with the approval of the committee, retake it on the same or possibly on a different topic, they generally are not allowed to take the advanced examination more than twice.

**See MATH in the Courses of Instruction section.**

# MECHANICAL ENGINEERING AND MATERIALS SCIENCE

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

### **CHAIR**

Enrique V. Barrera

### **ASSOCIATE CHAIR**

Andrew J. Meade

### **PROFESSORS**

John E. Akin

Andrew R. Barron

Yildiz Bayazitoglu

Michael M. Carroll

Fathi Ghorbel

Rex B. McLellan

Satish Nagarajaiah

Pol D. Spanos

Tayfun E. Tezduyar

James Tour

Boris I. Yakobson

### **PROFESSORS EMERITI**

Franz R. Brotzen

Alan J. Chapman

Angelo Miele

Chao-Cheng Wang

### **ASSISTANT PROFESSORS**

Brent C. Houchens

Jun Lou

Marcia K. O'Malley

### **PROFESSOR IN THE PRACTICE**

David M. McStravick

### **ADJUNCT PROFESSORS**

Thomas J.R. Hughes

Keith Stein

### **LECTURERS**

John J. Bertin

Robert Cunningham

Peter J. Loos

### **ADJUNCT ASSOCIATE PROFESSORS**

Sarmed Adnan

Aladin Boriek

Michael Massimino

### **ADJUNCT ASSISTANT PROFESSORS**

James B. Dabney

Chad M. Landis

### **ADJUNCT ASSOCIATE LECTURER**

John Muratore

## **DEGREES OFFERED: BA, BSME, BSMS, MME, MMS, MS, PHD**

Studies in mechanical engineering may lead to specialization in 1 of several areas, including mechanics, computational mechanics, stochastic mechanics, fluid dynamics, heat transfer, dynamics and control, robotics, biomedical systems, and aerospace sciences. Studies in materials science may lead to specialization in 1 of several areas, including nanotechnology, metals physics, statistical mechanics, metallic solid thermodynamics, materials chemistry, aspects of composites, coatings and thin films, and interface science.

The graduate program offers professional degrees in both materials science and engineering, which is based on undergraduate preparation in a number of related fields, and mechanical engineering, which permits specialization in the areas previously mentioned. Graduate students also may pursue research degrees. Faculty research areas are indicated in the previous paragraph. A joint MBA/Master of Engineering degree is available in conjunction with the Jesse H. Jones Graduate School of Management. Also, a combined MD and advanced research degree for research careers in medicine is available with Baylor College of Medicine.

The graduate program collaborates with other departments in its comprehensive educational and research activities. The Department of Computational and Applied Mathematics supports research in applied analysis and computational mathematics. Work on expert systems and robotics is done in cooperation

with the Departments of Electrical and Computer Engineering and Computer Science. Computer graphics research involves the cooperation of the Department of Computer Science and the School of Architecture. The campus-wide Rice Quantum Institute also is active in the research of electronic materials and other aspects of materials science. Finally, biomechanics and biomaterials research involves several institutions in the Texas Medical Center.

### **DEGREE REQUIREMENTS FOR BA, BS IN MECHANICAL ENGINEERING OR BA AND BS IN MATERIALS SCIENCE AND ENGINEERING**

For general university requirements, see Graduation Requirements (pages 14–15). The BA program in either mechanical engineering or materials science and engineering is highly flexible, involves less technical content than the BS, and allows students greater freedom to pursue areas of interest outside of engineering.

The 2 BS programs prepare students for the professional practice of engineering. During their senior year, mechanical engineering students in the BS program take courses in design application while completing a major design project, and materials science and engineering students in the BS program work on a design problem in an industrial setting. The BSME program is accredited by the Accreditation Board for Engineering and Technology (ABET). Departmental goals and objectives are available at [mens.rice.edu/undergraduate/goals.html](http://mens.rice.edu/undergraduate/goals.html).

**BS in Mechanical Engineering Program**—Lists of representative undergraduate courses and the usual order in which students take them are available from the department for either the BA or BS programs in both mechanical engineering and materials science and engineering. The BSME degree contains a core of required courses and selected electives from 1 of 6 specialization areas. The requirements (for a total of 132 hours) are:

#### ***Basic Mathematics and Science (30 hours)***

CHEM 121–122 *General Chemistry*  
MATH 101 *Single Variable Calculus I*  
MATH 102 *Single Variable Calculus II*  
MATH 211 *Ordinary Differential Equations  
and Linear Algebra*  
MATH 212 *Multivariable Calculus*  
MSCI 301 *Materials Science*  
PHYS 101 *Mechanics*  
PHYS 102 *Electricity and Magnetism*

#### ***Computational and Applied Mathematics (9 hours)***

CAAM 210 *Engineering Computation*  
CAAM 335 *Matrix Analysis*  
CAAM 336 *Differential Equations in Science  
and Engineering*

#### ***Senior Design (7 hours)***

MECH 407 *Mechanical Design Project I*  
MECH 408 *Mechanical Design Project II*

#### ***Labs (4 hours)***

MECH 331 *Mechanics Lab*  
MECH 332 *Thermo/Fluids Lab*  
MECH 340 *Industrial Process Lab*  
MECH 431 *Senior Lab*

#### ***Mechanical Engineering (31 hours)***

MECH 200 *Classical Thermodynamics*  
MECH 211 *Engineering Mechanics*  
MECH 311 *Mechanics-Deformable Solids*  
MECH 343 *Modeling of Dynamic Systems*  
MECH 371 *Fluid Mechanics I*  
MECH 401 *Machine Design*  
MECH 403 *Computer Aided Design*  
MECH 412 *Vibrations*  
MECH 420 *Fundamentals of Control Systems*  
MECH 481 *Heat Transfer*

***Limited Electives:*** 3 hours in any 300-level or higher STAT course

#### ***Technical Electives (9 hours)***

#### ***Distribution Electives (24 hours)***

#### ***Free Electives (15 hours)***

**Technical Electives**—Students are required to take a total of 3 technical electives. A minimum of 2 of these courses must come from Group A. The remaining course can come from Group A or B. Group A courses are fundamental courses in the following focus areas: aerospace engineering (AE), computational engineering (CompE), fluid mechanics and thermal science (FT), solid mechanics and materials (SMM), and system dynamics and control (SDC). Group B courses are additional technical electives that complement the focus areas listed above.

### Group A

- MECH 400 *Advanced Mechanics of Materials* (SMM)
- MECH 411 *Dyn and Control of Mech Sys* (SDC);
- MECH 417 *Finite Element Analysis* (CompE)
- MECH 454 *Comp. Fluid Mechanics* (AE, CompE)
- MECH 471 *App. of Thermodynamics* (FT)
- MECH 473 *Advanced Fluid Mechanics II* (FT)
- MECH 498 *Intro to Robotics* (SDC)
- MECH 594 *Introduction to Aerodynamics* (AE,FT)
- MSCI 402 *Mech Properties of Materials* (SMM)

**Group B**—See department for current listing

**BA with a Major in Mechanical Engineering Program**—Students seeking the BA degree with a major in mechanical engineering must complete 120 hours with at least 67 semester hours in courses specified by the department, along with 24 hours of university distribution electives and 29 hours of free electives. Lists of courses, including general university requirements and the usual order in which students take them, are available from the department. The BA program mirrors the BSME program in the freshman and sophomore years, with the exceptions that MECH 331 and MECH 340 are not required. Specific major requirements are completed in the junior and senior years, along with electives. A summary appears below:

#### Freshman Year

Same as BS with 24 major and 9 elective hours for 33 hours.

#### Sophomore Year

Same as BS (except MECH 331 and 340 are not required), with 18 major and 15 elective hours for 33 hours.

#### Junior and Senior Years

25 major and 29 electives for 54 hours. The following courses are required in junior and senior years:

CAAM 335 <i>Matrix Analysis</i> (3)	MECH 403 <i>Computer Aided Design</i>
CAAM 336 <i>Differential Equations in Science and Engineering</i> (3)	MECH 412 <i>Vibrations</i> (3)
MECH 343 <i>Modeling of Dynamic Systems</i> (4)	MECH 420 <i>Fundamentals of Control Systems</i> (3)
MECH 371 <i>Fluid Mechanics I</i> (3)	MECH 481 <i>Heat Transfer</i> (3)
MECH 401 <i>Machine Design</i> (3)	

**BA with a Major in Materials Science and Engineering Program**—Students seeking the BA degree with a major in materials science and engineering must

complete at least 52 hours in courses specified by the department plus additional hours for a total of 120 hours at graduation.

**BSMS Program**—Students seeking the BSMS must complete at least 91 semester hours in courses specified by the department within the total requirements of 134 hours. Basic departmental course requirements for the BSMS are as follows:

CHEM 121–122 *General Chemistry*  
 MATH 101 and 102 *Single Variable Calculus I and II*  
 MATH 211 *Ordinary Differential Equations and Linear Algebra*  
 MATH 212 *Multivariable Calculus*  
 MECH 211 *Engineering Mechanics*  
 MSCI 301 *Materials Science*  
 PHYS 101 *Mechanics*  
 PHYS 102 *Electricity and Magnetism*

**Specific requirements**

CAAM 210 *Introduction to Engineering Computation*  
 CAAM 335 *Matrix Analysis*  
 CEVE 300 *Mechanics of Solids*  
 ELEC 241 *Fundamentals of Electrical Engineering I* (or ELEC 243 *Introduction to Electronics*)  
 MSCI 301 *Materials Science*  
 MSCI 303 *Materials Science Junior Lab*  
 MSCI 311 *Introduction to Design*  
 MSCI 401 *Thermodynamics and Transport Phenomena in Materials Science*

MSCI 402 *Mechanical Properties of Materials*  
 MSCI 404 *Materials Engineering and Design*  
 MSCI 406 *Physical Properties of Solids* (or MSCI 415 *Ceramics and Glasses*)  
 MSCI 411 *Metallography and Phase Relations* (or MSCI 415 *Ceramics and Glasses*)  
 MSCI 500/501 *Materials Science Seminar*  
 MSCI 535 *Crystallography and Diffraction*  
 MSCI 537 *Materials Science Senior Lab*  
 MSCI 594 *Properties of Polymers*

**1 course from the following**

PHYS 201 *Waves and Optics*  
 CHEM 211 *Organic Chemistry*  
 CHEM 311 *Physical Chemistry*

**Electives**

1 approved science elective (at the 200 level or higher)  
 1 approved engineering science elective (not MSCI)  
 1 approved technical elective

**DEGREE REQUIREMENTS FOR MME, MMS, MS, AND PHD IN MECHANICAL ENGINEERING OR MATERIALS SCIENCE AND ENGINEERING**

**Professional Degree Programs**—The professional degrees offered by this department, the Master of Mechanical Engineering (MME) and the Master of Materials Science (MMS), involve a 5th year of specialized study, which is integrated with the four undergraduate years leading to either the BA or the BS degree in the same areas of interest. The professional degree programs are open to students who have shown academic excellence in their undergraduate studies.

For general university requirements, see Graduate Degrees (pages 57–58). For both the MME and MMS degrees, students must complete 30 semester hours of course work. Lists of suggested courses are available from the department. Students should develop a specific plan of study based on their particular interests.

**Research Degree Programs**—The programs leading to the MS and PhD degrees are open to students who have demonstrated outstanding performance in their undergraduate studies. The granting of a graduate research degree presupposes academic work of superior quality and a demonstrated ability to do original research.

For general university requirements, see Graduate Degrees (pages 57–58). Course requirements for the research degrees vary, depending on the extent of individual undergraduate preparation as well as each student's performance in graduate courses and on qualifying examinations. For both the MS and PhD degrees, students must present a thesis that comprises an original contribution to knowledge and defend it in a public oral examination.

Each graduate student is expected to render research and/or instructional assistance to the department not to exceed 10 hours per week. Graduate student work assignments will be made by the department chair at the beginning of each semester.

All graduate students (except professional masters students [MME/MMS]) must attend at least 75% of the MEMS seminars. See the MEMS website at [mems.rice.edu/graduate/gradregulations.html](http://mems.rice.edu/graduate/gradregulations.html) for details.

### **I. REQUIREMENTS FOR THE PROFESSIONAL MASTERS DEGREES (MME AND MMS)**

Students are expected to complete 30 semester hours of courses approved by the department (a 1-semester course is usually 3 semester hours credit). Specific courses to be taken depend on each student's field of study. Students must discuss their individual degree plans and programs of study with their advisors. Please see the MEMS department website at <http://mems.rice.edu/graduate/gradregulations.html> for details.

<b>Degree At Entrance</b>	<b>4-year BS</b>	<b>4-year BA</b>
Minimum graduate level semester hours required (course work)	30	30

See pages 14–15 for total semester hours required by Rice University.

### **II. REQUIREMENTS FOR THE MS DEGREE**

Full-time students seeking the MS degree are expected to complete all the requirements for the degree within 2 calendar years following entrance into the program. Continuation in the program beyond this time limit will require special approval of the department.

All entering graduate students pursuing a thesis degree program will be subject to a preliminary evaluation of their candidacy for the highest degree program they intend to pursue. The evaluation will be conducted by the end of the 2nd semester of enrollment in the graduate program in the MEMS department.

Each candidate for the MS degree must complete a thesis demonstrating ability in research of a fundamental nature (analytical or experimental). It is expected that the research will be of sufficient importance and quality that positive results would lead to publication. The examination will be conducted by a committee consisting of at least 3 members. Two, including the committee chair, must be members of the department.

The minimum semester hours of course work (a 1-semester course is usually 3 semester hours credit) required for the MS degree are tabulated below as a function of the degree held on entrance into the program. Research and thesis hours do not count towards these course requirements. In all cases, a student's specific course of study is formulated in consultation with the departmental



advisor (thesis director) and must be approved by the department. Please see the MEMS Department website at [mems.rice.edu/graduate/gradregulations.html](http://mems.rice.edu/graduate/gradregulations.html) for details.

<u>Degree At Entrance</u>	<u>5-year</u>	<u>4-year BS</u>	<u>4-year BA</u>
Minimum graduate level semester hours required (course work)	12	24	30

See pages 14–15 for total semester hours required by Rice University.

### III. REQUIREMENTS FOR THE PHD DEGREE

Full-time students seeking the PhD degree are expected to complete all the requirements for the degree within 5 calendar years following entrance into the program. Continuation in the program beyond this time limit will require special approval of the department.

All entering graduate students pursuing a thesis degree program will be subject to a preliminary evaluation of their candidacy for the highest degree program they intend to pursue. The evaluation will be conducted by the end of the 2nd semester of enrollment in the graduate program in the MEMS department. Students pursuing a PhD degree in materials science will be examined in 4 areas: 1) thermodynamics and kinetics; 2) structures, crystallography, and diffraction; 3) mechanical properties; and 4) electrical, optical, and magnetic properties.

By the end of the 3rd year of enrollment in the graduate program in the MEMS department, the student must pass an oral qualifying examination.

Each candidate for the PhD must complete a thesis that constitutes an original contribution to scientific knowledge (analytical or experimental). It is expected that the research will be of sufficient importance and quality that positive results would lead to publication. On completion of the thesis, each candidate for the PhD degree must pass a final public oral examination. The examination will be conducted by a committee consisting of at least 3 members. Two, including the committee chair, must be members of the department. One member must be from another department within the university.

The minimum semester hours of course work (a 1-semester course is usually 3 semester hours credit) required are tabulated below as a function of the degree held on entrance into the program. In all cases, a student's course of study is formulated in consultation with the thesis director and must be approved by the department. Please see the MEMS department website at [mems.rice.edu/graduate/gradregulations.html](http://mems.rice.edu/graduate/gradregulations.html) for details.

<u>Degree At Entrance</u>	<u>MS</u>	<u>5-year</u>	<u>BS</u>	<u>BA</u>
Minimum graduate level semester hours required (course work)	24	30	48	54

See pages. 14–15 for total semester hours required by Rice University.

See MECH and MSCl in the Courses of Instruction section.

# MEDIEVAL STUDIES

## THE SCHOOL OF HUMANITIES

### DIRECTOR AND ADVISOR

Jane Chance

### PROFESSORS

Jane Chance

Michael Maas

Donald Ray Morrison

Deborah Nelson-Campbell

### ASSOCIATE PROFESSORS

David Cook

Eva Haverkamp

Linda E. Neagley

Nanxiu Qian

Carol E. Quillen

Paula Sanders

Sarah Westphal

### ASSISTANT PROFESSORS

Peter Loewen

Scott McGill

### LECTURER

Edward Anderson

### DEGREE OFFERED: BA

This interdisciplinary major enables students to compare medieval cultures, noting both their differences and their common traditions, in the period between 500 and 1500 AD. The program combines a broad background in various aspects of medieval culture with more specialized study in a selected field. These fields of emphasis include medieval art history, history, literature (Arabic, Chinese, German, Italian, English, French, or Latin), music, philosophy, or religion.

### DEGREE REQUIREMENTS FOR BA IN MEDIEVAL STUDIES

For general university requirements, see Graduation Requirements in this publication. Students majoring in medieval studies must complete at least 30 semester hours (10 courses); the minimum for double majors is 30 hours. All majors must complete five (5) of these medieval studies courses at the 300 or 400 level.

Required and recommended courses include the following:

A minimum of 30 semester hours (10 semester courses), of which at least 5 courses must be at the 300/400 level. Double majors must complete a minimum of 24 semester hours.

1 course in medieval literature; 1 course in medieval art or music; 1 course in medieval history or philosophy

Frequently taught courses ( i.e., at least every 2 years):

#### *Literature*

- MDST 310 *Dante*
- MDST 316 *Chaucer*
- MDST 317 *Arthurian Literature*
- MDST 335 *Mapping German Culture: Courtship, Love, and Marriage in the Age of Chivalry*
- MDST 368 *Mythologies*
- MDST 370 *Introduction to Traditional Chinese Poetry*
- MDST 375 *Introduction to Classical Chinese Literature*

- MDST 379 *Women in Chinese Literature*
- MDST 404 *Beginnings in the Language and Literature of France*
- MDST 425 *Courtly Love in Medieval France*

#### **Art**

- MDST 330 *Early Medieval Art*
- MDST 331 *Gothic Art and Architecture in Northern Europe, 1140–1300*
- MDST 332 *Late Gothic Art and Architecture in Northern Europe, 1300–1500*

#### **Music**

- MDST 222 *Medieval and Renaissance Eras*
- MDST 429 *Music in the Middle Ages*

#### **History**

- HIST 359/RELI 358 *Humor and Entertainment in Islamic Societies*
- MDST 257/357 *Jews and Christians in Medieval Europe*
- MDST 281/381 *Pre-Modern Middle East History*
- MDST 382 *Classical Islamic Cultures*

#### **Philosophy**

- MDST 201 *History of Philosophy*

It is *recommended*, but not *required* that students take 2 semesters at the college level in an appropriate language (or language, in particular, Latin). Three courses (at least 2 at the 300 or 400 level) in the student's chosen field of emphasis—1 of these may be a directed reading course.

For single majors, 3 additional courses in the medieval period, 1 of which may be a senior thesis (1 semester) on a topic in the student's field of emphasis; for double majors, 1 additional course in the medieval period.

Students work out their programs of study in consultation with the program director. Those contemplating graduate work in medieval studies should study at least one foreign language in some depth (as most graduate schools require a reading knowledge of French and German for the PhD).

Students may select from among the following to fulfill the course requirements for the major in medieval studies.

Please note that not all courses listed below will be offered during the academic year. For a current list of courses that will be offered, please visit the Medieval Studies website at [medieval.rice.edu](http://medieval.rice.edu).

#### **Classical Studies**

- MDST 101 *Elementary Latin I*
- MDST 102 *Elementary Latin II*
- MDST 211 *Intermediate Latin I*
- MDST 212 *Intermediate Latin II*

#### **English**

- MDST 300 *Medieval Women Writers*
- MDST 310 *Dante in Translation*
- MDST 311 *Old English*
- MDST 313 *Beowulf*
- MDST 315 *Medieval Culture through Film*
- MDST 316 *Chaucer*
- MDST 317 *Arthurian Literature through Film*
- MDST 318 *J. R. R. Tolkien*

- MDST 320 *Directed Readings in Medieval Studies*
- MDST 368 *Mythologies*

#### **French Studies**

- MDST 404 *Beginnings of Language and Literature*
- MDST 410 *The Literary and Historical Image of the Medieval Woman*
- MDST 425 *Courtly Lore in Medieval France*
- MDST 436 *Literature and Culture of the Middle Ages*

#### **German Studies**

- MDST 126 *Freshman Seminar: The Legend of King Arthur in the Middle Ages*

MDST 330 *Mapping German Culture: Courtship, Love and Marriage in the Age of Chivalry*

MDST 402 *Middle High German*

### **History of Art**

MDST 104 *Case Studies in Ancient and Medieval Architecture*

MDST 108 *Art in Context: Late Medieval and Renaissance Culture*

MDST 111 *Introduction to the History of Western Art I: Prehistoric to Gothic*

MDST 230 *Medieval Art and Literature*

MDST 330 *Early Medieval Art*

MDST 331 *Gothic Art and Architecture in Northern Europe, 1140–1300*

MDST 332 *Late Gothic Art & Architecture in Northern Europe, 1300–1500*

MDST 431 *Architecture of the Gothic Cathedral from the Middle Ages to the 20th Century*

MDST 434 *From Beowulf to the Bayeux Tapestry*

MDST 440 *Jan van Eyck: Problems of Interpretation*

MDST 451 *Bosch and Bruegel*

### **History**

MDST 202 *Introduction to Medieval Civilization I: The Early Middle Ages*

MDST 203 *Introduction to Medieval Civilization II: The High Middle Ages*

MDST 223 *Medieval Empires*

MDST 257 *Jews and Christians in Medieval Europe*

MDST 281 *Pre-Modern Middle East History: The Middle East from the Prophet Muhammad to Sulayman the Magnificent*

MDST 308 *The World of Late Antiquity*

MDST 321 *Directed Readings in Medieval History*

MDST 323 *Medieval Empires* (enriched version)

MDST 345 *Renaissance Europe*

MDST 357 *Jews and Christians in Medieval Europe* (enriched version)

MDST 358 *European Intellectual History from Augustine to Descartes*

MDST 382 *Classical Islamic Cultures*

MDST 385 *Christians and Jews in the Medieval Islamic World*

MDST 438 *Women and Gender in Medieval Islamic Societies*

MDST 444 *Memory and Commemoration in the Middle Ages*

MDST 446 *Medieval Women*

MDST 447 *The Age of the Crusades*

MDST 488 *Topics in Medieval History*

### **Asian Studies**

MDST 370 *Introduction to Traditional Chinese Poetry*

MDST 375 *Introduction to Chinese Literature*

MDST 379 *Women in Chinese Literature*

### **Music**

MDST 222 *Medieval and Renaissance Eras*

MDST 427 *Topics in Early Music*

MDST 429 *Music of the Middle Ages*

MDST 456 *Collegium*

MDST 486 *Illuminated Music Manuscripts*

### **Philosophy**

MDST 201 *History of Philosophy I*

MDST 301 *Ancient and Medieval Philosophy*

MDST 481 *Seminar in Ancient and Medieval Philosophy*

**See MDST in the Courses of Instruction section.**

# MILITARY SCIENCE

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## **CHAIR AND PROFESSOR**

Lieutenant Colonel Anthony Landry

## **ASSISTANT PROFESSORS**

Major Tracy Hankins

Lieutenant Colonel (R) Wendell Harris

Master Sergeant Michael Kelley

Master Sergeant Robert Mullins

## **DEGREES OFFERED: NONE**

The goal of the U.S. Army ROTC program is to develop technically competent, physically fit, and highly motivated men and women for positions of responsibility as commissioned officers in the active U.S. Army, the U.S. Army Reserve, and the National Guard. Upon completion of the curriculum, students will have an understanding of the fundamental concepts and principles of the military as an art and as a science. The leadership and managerial experience gained through ROTC provides great benefit for students in both their civilian endeavors and in their military careers.

## **DEGREE REQUIREMENTS**

Rice does not offer a bachelor's in military science. However, interested students can obtain a degree in any of the other programs offered by Rice. Credit for courses in military science may be obtained by attending courses at the University of Houston. The financial aid available to a ROTC student may be used for Rice courses as well as the University of Houston ROTC courses.

For general university requirements, see Graduation Requirements (pages 14-15). For requirements for a specific degree program, see the pages for that degree program. For more information on the Army ROTC program in particular, contact the military science department at the University of Houston by calling 713-743-3875.

**Statutory Authority**—General statutory authority for establishment and operation of the ROTC program, including the scholarship program, is contained in Title 10, United States Code, Chapter 103 (Sec. 2102-2111). Specific rules and procedures are found in U.S. Army Regulation 145-1.

**Course Credit**—ROTC classes may be taken for elective credit toward any degree plan at the University of Houston or Rice University. Freshman- and sophomore-level classes are open to all students, regardless of age or physical condition. *No military obligation is incurred as a result of enrollment in these courses.* Junior- and senior-level courses are more restrictive and do require a military obligation. ROTC scholarship students also incur a military obligation.

**Four-Year Program**—The 4-year program is divided into 2 courses: the basic course, which is normally attended by students during their freshman- and sophomore years; and the advanced course, attended during the junior and senior years. Advanced course students attend a 6-week paid advanced camp in Fort Lewis, Washington, normally between their junior and senior years.

**The Basic Course**—The basic course consists of 4 semesters of military science, which include MILI 121, MILI 122, MILI 201, and MILI 202. These freshman- and sophomore-level classes are open to all students without obligation.

**The Advanced Course**—Students entering the advanced course must enter into a contract to pursue and accept a commission in the active army, the Army Reserve, or the National Guard. To be considered for contracting into the advanced course, the student must be a full-time student in a course of instruction that leads to a degree in a recognized academic field, have a minimum of 2 years of academic work remaining in a curriculum leading to a baccalaureate or advanced degree, be under age 30 when commissioned, and pass a physical and medical examination.

**2-Year Program**—The 2-year program is designed for students who did not take the basic course but otherwise are eligible to enroll in the advanced course. This program allows students completing their sophomore year to attend a 4-week Leader's Training Course during June and July at Fort Knox, Kentucky, in lieu of taking the 1st 2 years of ROTC. *There is no military obligation for attending Leader's Training Course.* The army provides transportation, room, and board. Students are paid approximately \$900 for the 4-week period.

**Laboratory Requirements**—A military science laboratory is required for students enrolling in MILI 121, MILI 122, MILI 201, MILI 202, MILI 301, MILI 302, MILI 401, and MILI 402. This laboratory provides hands-on opportunities for marksmanship training, rappelling, drill and ceremonies, communications training, and other activities.

**Veterans**—Veterans who have served on active duty or in the Army Reserve or National Guard also are eligible for the ROTC program. Although veterans are not required to take the basic course, they are encouraged to do so. All students, including veterans, must have a minimum of 54 credit hours prior to enrolling in the advanced course.

**National Guard and Army Reserve Members**—Students enrolled in ROTC may also be members of the Army Reserve/National Guard. Through the Simultaneous Membership Program (SMP), those students enrolled in the advanced course will be placed in a leadership position as a cadet and will receive pay and entitlements from the National Guard or Army Reserve in the pay grade of Sergeant (E-5).

**Financial Assistance**—The United States Army offers, on a competitive nationwide basis, 4-, 3-, and 2-year scholarships. The scholarships cover up to \$20,000 of tuition. Recipients also receive benefits for educational fees (to include lab fees), a book allowance, and a subsistence allowance ranging from \$300 to \$500 per month. Applicants must be U.S. citizens and must be under age 27 on the anticipated graduation date. Applications are available from the military science department. Veteran applicants can extend the age limit up to a maximum of 3 years, based on prior active duty service.

**Other Financial Aid**—All students enrolled in the advanced course will receive a subsistence allowance of \$400 per month junior year and \$500 per month senior year. For more information, contact the military science department. GI Bill recipients still retain benefits.

**Tuition**—Members of the Army or the Army Reserve, National Guard, Texas State Guard, or other reserve forces may be exempted from the nonresident tuition fee and other fees and charges.

**Special Training**—Basic- and advanced-course students may volunteer for and may attend the U.S. Army Airborne and Air Assault courses during June, July,

and August. Cadet Troop Leadership Training positions also are available to Advanced-course cadets during the summer months.

**Miscellaneous**—All participating cadets are eligible for our internal scholarships provided by our alumni and sponsors of the program.

The Corps of Cadets sponsors an annual military ball in addition to other social events throughout the school year. The Department of Military Science sponsors extracurricular activities such as the University of Houston Color Guard and the Ranger Challenge Team.

**Minor in Military Science**—To qualify for a minor in military science, students must complete a minimum of 18 semester hours of course work, of which 12 must be advanced. Nine semester hours must be completed in residence, of which 6 must be advanced. Students also must attend advanced camp. Students must attain a 3.0 grade point average or higher in military science courses attempted at this university. Students may receive credit for 100- and 200-level courses based on prior military training, completion of ROTC Basic Camp, completion of JROTC training, or completion of 1 year at a service academy.

**See MILI in the Courses of Instruction section (these are University of Houston listings).**

## MUSIC

## THE SHEPHERD SCHOOL OF MUSIC

**DEAN**

Robert Yekovich

**PROFESSORS**

Robert Atherholt

Richard Bado

Richard Brown

Leone Buyse

Marcia J. Citron

James Dunham

Paul V. H. Ellison

Norman Fischer

Kenneth Goldsmith

Arthur Gottschalk

Lynn Harrell

Clyde Holloway

Thomas I. Jaber

Benjamin C. Kamins

Kathleen Kaun

Stephen King

Richard Lavenda

Cho-Liang Lin

Sergiu Luca

Susanne Mentzer

Jon Kimura Parker

Larry Rachleff

Robert Roux

Marie Speziale

Ivo-Jan van der Werff

William VerMeulen

Michael Webster

Kathleen Winkler

**ASSOCIATE PROFESSORS**

Walter B. Bailey

Anthony K. Brandt

David Ferris

Pierre Jalbert

David E. Kirk

Thomas LeGrand

Paula Page

Timothy Pitts

Brinton Smith

David L. Waters

**ASSISTANT PROFESSORS**

Karim Al-Zand

Gregory Barnett

Shih-Hui Chen

Peter V. Loewen

Kurt Stallmann

**INSTRUCTOR**

Joan DerHovsepien

**ARTIST TEACHERS**

Brian Connelly

Jan de Chambrier

Debra Dickinson

Jeanne Kierman Fischer

Christopher French

Angela Fuller

Hans Graf

Sohyoung Park

Janet Rarick

C. Dean Shank Jr.

**LECTURERS**

Nancy Gisbrecht Bailey

Rachel Buchman

Susan Dunn

Phillip Kloeckner

Virginia Nance

Sylvia Ouellette

Robert Simpson

**ADJUNCT PROFESSORS**

David B. Rosenfield

C. Richard Stasney

**ADJUNCT LECTURER**

Pieter A. Visser

**DEGREES OFFERED: BA, BMUS, BMUS/MMUS, MMUS, DMA**

At the undergraduate level, the Shepherd School of Music offers both professional training and a broad liberal arts curriculum. Degree programs include a BA degree in music and a BMus degree in performance, composition, music history, and music theory. Acceptance into a 5-year honors program leads to the simultaneous awarding of the BMus and MMus degrees.

At the graduate level, the school offers professional music training for qualified students who concentrate on music composition, performance, or research that



is supported by lab or performing ensembles. This training includes theory and history seminars. Advanced degree programs include a MMus degree in composition, choral and instrumental conducting, historical musicology, performance, and music theory and a DMA degree in composition and selected areas of performance.

### REQUIREMENTS FOR ALL MUSIC MAJORS

For general university requirements, see Graduation Requirements (pages 14–15). All students majoring in music must participate in core music, applied music, and other required music courses as well as in chamber music and large ensembles, plus electives. They are entitled to one hour of private lessons each week of each semester they are enrolled as a music major; private or group lessons beyond this may result in additional fees. Students in the BA program who wish to continue taking private lessons beyond the required four semesters of instrumental or vocal study must obtain permission from the dean of the Shepherd School.

**Examinations**—At the end of each semester, a jury examination in applied music is given over the material studied during the semester. All degree candidates except BA students must demonstrate keyboard proficiency by examination. If students have little or no knowledge of the keyboard, they should enroll in secondary piano at the beginning of their first semester and continue study until they can meet the examination requirements.

**Performance**—Students are expected to perform frequently during their residence at Rice. Performance majors must present at least 2 full recitals. Composition and conducting students should present recitals as specified by their degree programs. Students are expected to attend both faculty and student recitals. In addition, all music majors must participate in the school's conducted ensembles as assigned.

### DEGREE REQUIREMENTS FOR BA IN MUSIC, BMUS, AND BMUS/MMUS

**Admission**—An audition, either in person or on tape, is required of each undergraduate applicant. The Shepherd School faculty and the university's Committee on Admission jointly determine admission, the latter basing its evaluation on successful academic achievement and other standards of college admission. Transfer applicants from other colleges, conservatories, and universities also must provide an audition, personal or taped, and take placement exams in both music history and music theory. Once admitted, their prior preparation in music is assessed, which may reduce the required period of study at Rice.

**BA and BMus Program**—For general university requirements, see Graduation Requirements (pages 14–15).

For either bachelor's degree, students majoring in music must have a total of at least 120 semester hours at graduation. The complete curriculum for each major in music is available in the *Shepherd School Student Handbook* or in the undergraduate music office on the second floor of Alice Pratt Brown Hall. While the number of required hours vary according to major area, all music students must take the following core courses (those in the BA program are not required to take MUSI 331, 332, and 431).

- *Music Theory*: MUSI 211, 212, 311, 312, and a theory elective chosen from MUSI 416, 512, 513, or 613.

- *Music History*: MUSI 222, 321, 322, and 421.
- *Aural Skills and Performance Techniques*: MUSI 231, 232, 331, 332, and 431.

**BMus/MMus Honors Program**—The same general university requirements apply, but students seeking the combined BMus/MMus degree must complete a total of at least 150 semester hours by graduation. The number of required hours varies according to major area.

The 1st 5 semesters of course work in this program parallel the core curriculum of the bachelor's degrees. The sixth semester is a transitional semester during which students qualify for admission to the combined program. For further information, including application procedures, see the *Shepherd School Student Handbook*.

## DEGREE REQUIREMENTS FOR MMUS AND DMA IN MUSIC

**Admission**—For instrumental, voice, and conducting applicants, an audition is required. Composition majors must submit portfolios, and musicology and theory majors must provide samples of their written work. The Graduate Record Examination (GRE) is required of graduate applicants in musicology and theory. Musicology applicants also must complete the advanced music tests.

**Requirements**—For general university requirements, see Graduate Degrees (pages 57–58). For the MMus degree, candidates must complete at least 2 semesters of full-time study at Rice. Semester hour minimums for the MMus degree vary according to major area. For the DMA, candidates must complete a total of 90 hours beyond the bachelor's degree, attending Rice full time for at least 4 semesters after receiving their MMus degree.

**Thesis**—A thesis is required of both music history and music theory majors. In lieu of a thesis, composition majors must produce an original work of extended scope, and conducting majors must present an extended composition or project.

## ACADEMIC STANDARDS

**Curriculum and Degree Requirements**—Further information on curricular requirements for all majors and degree programs is available from the Shepherd School of Music.

**Grading Policy**—All music students must achieve at least a B– in course work in their major applied area. Students who receive a C+ or lower in their major applied area are placed on music probation. Music probation signifies that the work of the student has been sufficiently unsatisfactory to preclude graduation unless marked improvement is achieved promptly. While on probation, they may not be absent from class except for extraordinary reasons, and they may not represent the school in any public function that is not directly part of a degree program. After receiving a second C+ or lower in their major area, whether in consecutive semesters or not, students are discontinued as music majors.

**Leaves of Absence and Voluntary Withdrawal**—Music majors must obtain permission in writing from the dean of the Shepherd School before requesting a leave of absence from the university. Requests must be in the dean's office before the 1st day of classes in the semester for which leave is requested.

Music majors taking voluntary withdrawal from the university are not guaranteed readmission into the Shepherd School and may be asked to reapply/reaudition.

Students should explain the reasons for their withdrawal to the dean before leaving campus.

### **OTHER MUSICAL OPPORTUNITIES**

**For Nonmajors**—Students who are not music majors may take the following courses designed for the general student (other music courses require the permission of the instructor and the approval of the dean of the Shepherd School).

- MUSI 111 *Musical Lives*
- MUSI 112 *Great Literature in Great Music*
- MUSI 117/118 *Fundamentals of Music I and II*
- MUSI 317/318 *Theory for Nonmajors I and II*
- MUSI 327/328 *Music Literature for Nonmajors I and II*
- MUSI 334/335 *Campanile Orchestra and Rice Chorale*
- MUSI 141–197 for individual instruction in all instruments
- MUSI 340 *Concert Band*
- MUSI 342 *Jazz Ensemble*
- MUSI 345 *Jazz Improvisation*
- MUSI 415 *Band Arranging*

**Lectures and Performances**—A visiting lecturer series, a professional concert series, and numerous distinguished visiting musicians contribute to the Shepherd School environment. The Houston Symphony Orchestra, Symphony Chorus, Houston Grand Opera, Texas Opera Theater, Houston Ballet, Houston Oratorio Society, Da Camera, Context, and Houston Friends of Music, as well as the activities of other institutions of higher learning in the area, also provide exceptional opportunities for students to enjoy a wide spectrum of music.

**See MUSI in the Courses of Instruction section.**

# NANOSCALE PHYSICS

## THE WIESS SCHOOL OF NATURAL SCIENCES

**DIRECTOR**

F. Barry Dunning

**PROFESSORS**

Andrew R. Barron

Vicki L. Colvin

**ASSOCIATE PROFESSORS**

Thomas C. Killian

Frank R. Toffoletto

**ASSISTANT PROFESSORS**

Jason H. Hafner

Douglas A. Natelson

**DEGREES OFFERED: MS**

Rice University introduced the professional master's degree in nanoscale physics in fall 2002. This program combines a strong component in quantum theory, which governs the behavior of systems at the nanoscale, with the study of practical nano- and mesoscale devices. The program provides the student with the knowledge required to successfully navigate the emerging field of nanotechnology. New courses cover cutting-edge areas such as quantum behavior of nanostructures, quantum nanotechnology, nanoscale imaging, and the fabrication of nanostructures. In addition, a year-long course in methods of experimental physics ensures that students obtain the advanced practical skills valuable to industry.

The nanoscale physics degree is 1 of 3 tracks in the Professional Master's Program at Rice housed in the Wiess School of Natural Sciences. These master's degrees are designed for students seeking to gain further scientific core expertise coupled with enhanced management and communication skills. These degrees instill a level of scholastic proficiency that exceeds that of the bachelor's level and creates the cross-functional aptitudes needed in modern industry. This will allow students to move more easily into management careers in consulting or research and development, design, and marketing of new science-based products.

**DEGREE REQUIREMENTS FOR THE MS IN NANOSCALE PHYSICS**

In addition to the core science courses, students are required to complete a 3- to 6-month internship and take a set of cohort courses focusing on business and communication. At the conclusion of the internship, students must present a summary of the internship project in both oral and written form as part of the Professional Master's Seminar.

Part-time students who already work in their area of study may fulfill the internship requirement by working on an approved project with their current employer. Certain course requirements may be waived based upon prior graduate coursework or industrial experience. For general university requirements for graduate study, see pages 64–70 and see also Professional Degrees, page 58.

**ADMISSION**

Admission to graduate study in nanoscale physics is open to qualified students holding a bachelor's degree in physics, electrical engineering, or a related field that includes intermediate level work in mathematics, electrodynamics, and quantum physics. Department faculty evaluate the previous academic record and credentials of each applicant individually.

**Science core courses:**

- PHYS 533 *Nanostructures and Nanotechnology I* (F)  
 PHYS 539 *Characterization and Fabrication at the Nanoscale* (F)  
 PHYS 537 *Methods of Experimental Physics I* (F)  
 PHYS 534 *Nanostructures and Nanotechnology II* (S)  
 PHYS 538 *Methods of Experimental Physics II* (S)  
 PHYS 416 *Computational Physics* (S)

**Cohort courses:**

- NSCI 501 *Professional Master's Seminar* (F, S)  
 [required for 2 semesters]  
 NSCI 511 *Science Policy and Ethics* (S)  
 NSCI 512 *Professional Master's Project* (F, S)  
 NSCI 610 *Management in Science and Engineering* (F)  
 NSCI 625 *New Venture Creation for Science and Engineering*

**INTERNSHIP**

An internship may be conducted under the guidance of a host company, government agency, or national laboratory. A summary of the internship project is required in both oral and written form as part of the Professional Master's Project.

**ELECTIVE COURSES**

Note: Each of these electives is not offered every year, and some courses may have prerequisites or require instructor permission.

Students will choose four elective courses, 2 of which must be science or engineering 500 level or above. Recommended courses include, but are not limited to, the following:

- |                                                                      |                                                                     |
|----------------------------------------------------------------------|---------------------------------------------------------------------|
| CAAM 378 <i>Introduction to Operations Research</i> (F)              | ELEC 685 <i>Fundamentals of Medical Imaging</i> (F)                 |
| CENG 630 <i>Chemical Engineering of Nanostructured Materials</i> (S) | ENGI 303 <i>Engineering Economics and Management</i> (S)            |
| CHEM 533 <i>Nanoscale Chemistry</i>                                  | MGMT 617 <i>Managerial Decision Making</i> (S)                      |
| CHEM 547 <i>Supramolecular Chemistry</i> (F)                         | MGMT 636 <i>Systems Analysis and Database Design</i>                |
| CHEM 630 <i>Molecular Spectroscopy and Group Theory</i> (F)          | MGMT 661 <i>International Business Law</i> (F)                      |
| ELEC 561 <i>Topics in Semiconductor Manufacturing</i> (S)            | MGMT 674 <i>Production and Operations Management</i> (F)            |
| ELEC 562 <i>Submicrometer and Nanometer Device Technology</i> (S)    | MGMT 676 <i>Project Management/Project Finance</i> (S)              |
| ELEC 565 <i>Topics in Semiconductor Nanostructures</i> (F)           | MGMT 721 <i>General Business Law</i> (S)                            |
| ELEC 568 <i>Laser Spectroscopy</i> (F)                               | NSCI 625 <i>New Venture Creation in Science and Engineering</i> (S) |
| ELEC 603 <i>Nano-optics and Nanophotonics</i> (F)                    | PHYS 569 <i>Ultrafast Optical Phenomena</i> (S)                     |

**PROFESSIONAL SCIENCE MASTER'S 5TH YEAR DEGREE  
 OPTION FOR RICE UNDERGRADUATES**

Rice students have an option to achieve the MS in nanoscale physics by adding an additional 5th year to the 4 undergraduate years of science studies. Advanced Rice students in good standing apply during their junior year, then start taking required core courses of the nanoscale physics program during their senior year. A plan of study based on their particular focus area will need to be approved by the track director and the PSM coordinator.

# NAVAL SCIENCE

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**CHAIR**

Dave A. Murray

**ASSOCIATE PROFESSOR**

Benjamin Copeland

**ASSISTANT PROFESSORS**

Domenic P. Carlucci

Jonathan Lentz

Mark Schouten

**DEGREES OFFERED: NONE**

Students enroll in the Navy Reserve Officers' Training Corps (ROTC) program as scholarship or nonscholarship students. The Department of Naval Science is administered by a senior U.S. Navy officer, assisted by officers and enlisted personnel of the U.S. Navy and Marine Corps.

**DEGREE REQUIREMENTS**

Rice does not offer a bachelor's in naval science. However, interested students can obtain a degree in any of the other programs offered by Rice. Credit for courses in naval science may be obtained. Financial aid and scholarships may be available to a Navy ROTC student.

For university requirements for a specific degree, see Graduation Requirements and the section pertaining to that degree. Program requirements differ slightly depending on the student's scholarship status.

Scholarship Navy ROTC students are appointed midshipmen, U.S. Naval Reserve, on a nationwide competitive basis. They receive stipend pay of \$250-\$400 per month for a maximum of 4 academic years, with all tuition, fees, and equipment paid for by the Navy. Additionally, students receive \$375 per semester for books. Midshipmen must complete the prescribed naval science courses and participate in drills and 3 summer cruises. After graduating with a bachelor's degree, they accept a commission as an ensign in the U.S. Navy or as a 2nd lieutenant in the U.S. Marine Corps.

Nonscholarship Navy ROTC students enter into a mutual contract with the Secretary of the Navy to take naval science courses and to participate in drills and 1 summer training cruise. On a competitive basis, students may apply to continue in the Navy ROTC program through their junior and senior years. The U.S. Navy pays these continuing students \$300-\$400 per month during their junior and senior years, offering them a commission in the U.S. Navy or Marine Corps upon graduation. The program chair may recommend nonscholarship students, on a local competitive basis, for scholarship status.

**2-Year Program Option**—In their sophomore year (junior year for 5-year Rice students), students may apply for the 2-year Navy ROTC program, competing nationwide for available scholarships. If selected, they attend the 6-week Naval Science Institute (NSI) at Newport, Rhode Island, during July and August. NSI provides students with course material and training normally covered during the 1st 2 years of the regular

Navy ROTC program. Successful completion of NSI qualifies students for enrollment in the advanced Navy ROTC program on an equal footing with the 4-year students. Usually about 15 percent of the nonscholarship students finishing NSI are offered 2-year Navy ROTC scholarships. Additional scholarships occasionally may be awarded to others upon the recommendation of the program chair.

**U.S. Marine Corps Option Program**—Navy ROTC students, either scholarship or nonscholarship, may apply for the U.S. Marine Corps program. Students selected for that program are referred to as "Marine Corps option students" and complete Evolution of Warfare and Amphibious Operations classes during their junior and senior years.

**See NAVA in the Courses of Instruction section.**

# NEUROSCIENCES

## THE SCHOOL OF SOCIAL SCIENCES

**DIRECTOR**

James L. Dannemiller

**PROFESSORS**

Steven J. Cox

John W. Clark

James L. Dannemiller

Don H. Johnson

Randi C. Martin

James R. Pomerantz

Michael Stern

Devika Subramanian

Moshe Y. Vardi

Rick K. Wilson

**PROFESSOR EMERITUS**

Sydney M. Lamb

**ASSOCIATE PROFESSOR**

Tony Ro

**ASSISTANT PROFESSORS**

Darcy Burgund

Denise Chen

Mary E. Lane

Jessica M. Logan

Robert Raphael

Tatiana I. Schnur

**DEGREES OFFERED: NONE**

In the 1999–2000 academic year, Rice University began offering a new set of courses in the area of neuroscience to supplement a set of courses already offered by various departments in closely allied areas. These courses, which carry the designation NEUR, are offered in part by faculty associated with the Division of Neurosciences at Baylor College of Medicine, in part by faculty at the University of Texas Medical School at Houston, and in part by faculty at Rice in several different departments (including biochemistry and cell biology, computer science, electrical and computer engineering, linguistics, and psychology.) They are intended primarily for Rice graduate students but, with permission, are available to advanced undergraduates. Some of these classes are taught at the nearby Texas Medical Center campus and some are taught according to Baylor's or UT's academic calendars, which are different from Rice's. For further information on what courses are available and for instructions on how to apply to enter these classes, consult Rice's neuroscience website at [www.ruf.rice.edu/~neurosci/](http://www.ruf.rice.edu/~neurosci/).

See NEUR in the Courses of Instruction section.



# PHILOSOPHY

## THE SCHOOL OF HUMANITIES

### CHAIR

Steven Crowell

### PROFESSORS

Baruch Brody

Hugo Tristram Engelhardt Jr.

Richard E. Grandy

Mark Kulstad

Donald Ray Morrison

George Sher

### ASSOCIATE PROFESSOR

TBN

### ASSISTANT PROFESSOR

Melinda Fagan

Nicoletta Orlandi

Hanoch Sheinman

### ADJUNCT PROFESSOR

Laurence McCullough

### VISITING PROFESSOR

Hans Poser

### POSTDOCTORAL FELLOW

Pei Koay

## DEGREES OFFERED: BA, MA, PHD

Philosophy is best described as the attempt to think clearly and deeply about the fundamental questions that arise for us as human beings. What is the nature of knowledge (epistemology)? How are we to distinguish between what really is and what only seems to be (metaphysics)? What is the right thing to do (ethics)? Is there any meaning to existence? To study the history of philosophy is to study the best, most enduring answers that have been given to these questions in the past. Because every other field of study adopts some stance toward these questions, though often implicitly, philosophical issues arise in the natural and social sciences, history, linguistics, literature, art, and so on. Special courses in philosophy deal with each of these. Characteristic of philosophy are commitments to the construction and evaluation of arguments, to expressing thoughts clearly and precisely, and to defending one's ideas and evaluating the ideas of others. The study of philosophy thus provides resources for critical participation in all realms of human endeavor.

The graduate program trains students to teach and pursue research in the main areas of department concentration: ethics (especially bioethics) and social and political philosophy, history of philosophy, continental philosophy, and core portions of contemporary analytic philosophy.

## DEGREE REQUIREMENTS FOR BA IN PHILOSOPHY

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in philosophy must complete 30 semester hours (10 3-hour departmental courses); at least 18 hours (6 courses) must be at the 300 level or above. A double major must complete 27 hours (9 3-hour departmental courses) with all other requirements remaining the same.

Majors must take the following courses:

- PHIL 201 *History of Philosophy I*
- PHIL 202 *History of Philosophy II*
- Either PHIL 106 *Logic* or PHIL 305 *Mathematical Logic*

In addition, majors must take at least 1 course from each of the following area lists:

**History**PHIL 301 *Ancient and Medieval Philosophy*PHIL 302 *Modern Philosophy*PHIL 308 *Continental Philosophy*PHIL 321 *Kant and 19th Century Philosophy***Core Analytic**PHIL 303 *Theory of Knowledge*PHIL 304 *Metaphysics*PHIL 312 *Philosophy of Mind*PHIL 313 *Philosophy of Science*PHIL 353 *Philosophy of Language***Value Theory**PHIL 306 *Ethics*PHIL 307 *Social & Political Philosophy*PHIL 326 *History of Ethics*PHIL 327 *History of Social & Political  
Philosophy***HONORS PROGRAM IN PHILOSOPHY:**

Qualified majors may apply before their senior year for directed honors research writing during both semesters of the senior year. Each semester will require 3 credit hours; these 6 hours are in addition to the course hours required for the major.

To qualify for the program, students will be required to have an approved research proposal and the agreement of a faculty member to serve as advisor for that project. Applicants also normally will be required to have at least a 3.5 GPA in philosophy courses and to have completed at least 2 upper level courses in the distribution area of the proposed research. (See the major requirements for the definition of the distribution areas.) Applications should be submitted to the undergraduate advisor (UGA) and will be evaluated by the department.

Students who are considering applying to the honors program should consult the UGA and potential advisors as early as possible. Normally students will apply before preregistration in the second semester of their junior year and will spend time during the following summer reading from a list they have developed with their advisor. The thesis normally will be between 7,500 and 15,000 words (approximately 30–60 pages) in length. Students will enroll in either PHIL 411 and 412 or HONS 470 and 471. Students who are accepted by the Rice University Scholars Program will be granted departmental honors for their work in that program if they meet the requirements in this statement. Note that acceptance into the departmental honors program is a separate process from acceptance in RUSP, as is the evaluation for departmental honors.

The thesis must be completed by April 1. Once the advisor and another reader chosen by the department have read and evaluated the thesis, the final decision on honors will be made by the entire faculty. Completion of the major with at least a 3.5 GPA in all philosophy courses is required for departmental honors. The grade for the paper applies to the full 6 hours. Students who miss the thesis deadline but meet the university deadline for the semester will receive a grade and credit for completed work, but no honors. Students whose thesis is not awarded honors will receive a grade and credit for completed work, but no honors.

**DEGREE REQUIREMENTS FOR MA AND PHD  
IN PHILOSOPHY**

For general university requirements, see Graduate Degrees (pages 57–58). Students have the additional option of applying for a doctoral program specializing in bioethics (see below).

For the **MA** in philosophy, candidates must:

- Complete with high standing at least 30 semester hours in advanced courses approved by the department
- Complete a written thesis on a subject approved by the department
- Perform satisfactorily on a final oral examination (not limited to the student's special field of study)

For the **PhD** in philosophy, candidates must:

- Complete with high standing 42 hours of course work approved by the department (including logic)
- Demonstrate competence in logic
- Pass a qualifying examination
- Perform satisfactorily on an oral defense of their thesis proposal
- Complete a written thesis on a subject approved by the department (at least 1 year of thesis research must be spent in residence)
- Perform satisfactorily on a final oral examination (not limited to the student's special field of study)

**Bioethics Program**—The PhD in philosophy with a specialization in medical ethics is offered in cooperation with the Center for Medical Ethics and Health Policy at Baylor College of Medicine. Applicants to this special program must have enough background in philosophy to complete 2 and a half years of strong general training in philosophy at the graduate level. After completing their general training, students receive instruction in clinical bioethics at Baylor College of Medicine and then write a dissertation drawing on their philosophical and clinical training. Further information about this program is available from the Department of Philosophy.

#### **CONTINENTAL PHILOSOPHY PROGRAM**

The PhD program in continental philosophy allows graduate students to take advantage of resource faculty in history, French studies, philosophy, and religious studies, all of whom have done distinguished philosophical work in the Continental tradition. Students master the basic fields of analytic philosophy while doing a substantial amount of their course work with resource faculty. Further information is available from the Department of Philosophy.

**See PHIL in the Courses of Instruction section.**

# PHYSICS AND ASTRONOMY

## THE WIESS SCHOOL OF NATURAL SCIENCES

### CHAIR

F. Barry Dunning

### PROFESSORS

Billy E. Bonner  
 Paul A. Cloutier  
 Marjorie D. Corcoran  
 Michael W. Deem  
 Rui-Rui Du  
 Ian M. Duck  
 Reginald J. Dufour  
 Arthur A. Few Jr.  
 James P. Hannon  
 Thomas W. Hill  
 Huey W. Huang  
 Randall G. Hulet  
 Neal Lane  
 Eugene H. Levy  
 Edison P. Liang  
 Hannu E. Miettinen  
 Gordon S. Mutchler  
 Peter Nordlander  
 Carl Rau  
 Patricia H. Reiff  
 Jabus B. Roberts Jr.  
 Qimiao Si  
 Paul M. Stevenson

### PROFESSORS EMERITI

Stephen D. Baker  
 John W. Freeman  
 F. Curtis Michel  
 Ronald F. Stebbings  
 G. King Walters  
 Richard A. Wolf

### ASSOCIATE PROFESSORS

David Alexander  
 Anthony A. Chan  
 Stanley A. Dodds  
 Patrick M. Hartigan  
 Thomas C. Killian  
 Douglas A. Natelson  
 B. Paul Padley  
 Frank R. Toffoletto

### ASSISTANT PROFESSORS

Matthew G. Baring  
 Carlos J. Bolech  
 Giovanni Fossati  
 Jason H. Hafner  
 Christopher Johns-Krull  
 Ching-Hwa Kiang  
 Emilia Morosan  
 Uwe Oberlack  
 Han Pu

### ADJUNCT PROFESSORS

Markus Aschwanden  
 James L. Burch  
 Franklin R. Chang-Diaz  
 James H. Newman  
 Carolyn Sumners  
 David T. Young

### ADJUNCT ASSOCIATE PROFESSORS

Hui Li  
 Gary A. Morris  
 Alexander J. Rimberg

### INSTRUCTORS

Sarah B. Nagel  
 Leonard E. Suess

### SENIOR FACULTY FELLOWS

William J. Llope  
 Ian A. Smith  
 Pablo P. Yepes

### FACULTY FELLOW

Stanislav Sazykin

## DEGREES OFFERED: BA, BS, MST, MS, PHD

The Department of Physics and Astronomy offers undergraduate and graduate programs for a wide range of interests. The bachelor of arts degrees in physics and astronomy are suitable for students who wish to obtain a broad liberal education with a concentration in physical science. The bachelor of science degrees in physics, astrophysics, and chemical physics provide preparation for employment or further study in physics and related fields. Students in the professional nonthesis, MST program obtain training in science teaching. Research facilities and thesis supervision are available for MS and PhD students

in atomic, molecular, and optical physics; biophysics; condensed matter and surface physics; earth systems science; nuclear and particle physics; observational astronomy; solar system physics; space plasma physics; and theoretical physics and astrophysics.

## UNDERGRADUATE DEGREE REQUIREMENTS

For general university requirements, see Graduation Requirements (pages 14–15). Major requirements consist of a common core of basic physics and mathematics courses, with additional course work specific to each degree program. Students may obtain credit for some courses by advanced placement, and the department's undergraduate committee can modify requirements to meet the needs of students with special backgrounds.

### **All physics majors must complete the following courses:**

PHYS 101 or 111 *Mechanics (with Lab)*  
 PHYS 102 or 112 *Electricity and Magnetism (with Lab)*  
 PHYS 201 *Waves and Optics*  
 PHYS 202 *Modern Physics*  
 PHYS 231 *Elementary Physics Laboratory II*

### **Additional courses for the BS degree in physics:**

PHYS 302 *Intermediate Electrodynamics*  
 PHYS 311/312 *Introduction to Quantum Physics I and II*  
 PHYS 331/ 332 *Junior Physics Laboratory I and II*  
 PHYS 411 *Introduction to Nuclear and Particle Physics*  
 PHYS 412 *Solid-state Physics*  
 PHYS 425 *Statistical and Thermal Physics*  
 PHYS 491/492 *Undergraduate Research*

### **Additional courses for the BS degree in physics with option in applied physics:**

PHYS 302 *Intermediate Electrodynamics* or ELEC 306 *Electromagnetic Fields and Devices*  
 PHYS 311 *Introduction to Quantum Physics I*  
 PHYS 312 *Introduction to Quantum Physics II* or ELEC 361 *Electronic Materials and Quantum Devices*  
 2 of: PHYS 331/332 *Junior Physics Laboratory I and II*, ELEC 342 *Electronic Circuits*, and ELEC 465 *Physical Electronics Practicum*  
 PHYS 412 *Solid-state Physics* or approved substitute in applied physics  
 PHYS 425 *Statistical and Thermal Physics*  
 PHYS 491/492 *Undergraduate Research*

PHYS 301 *Intermediate Mechanics*  
 MATH 101/102 *Single Variable Calculus I and II*  
 MATH 211 *Ordinary Differential Equations and Linear Algebra*  
 MATH 212 *Multivariable Calculus* (MATH 221/222 *Honors Calculus III and IV* may substitute for MATH 211/ MATH 212)

PHYS 493/494 *Undergraduate Research Seminar*  
 (The undergraduate research course and seminar must be taken concurrently.)  
 MATH 381 *Introduction to Partial Differential Equations* and MATH 382 *Complex Analysis* or CAAM 335 *Matrix Analysis* and CAAM 336 *Differential Equations in Science and Engineering*  
 CHEM 121/122 *General Chemistry with Laboratory* or CHEM 151/152 *Honors Chemistry with Laboratory*

PHYS 493/494 *Undergraduate Research Seminar*  
 (The undergraduate research course and seminar must be taken concurrently.)  
 ELEC 242 *Fundamentals of Electrical Engineering II* or ELEC 243 *Introduction to Electronics*  
 ELEC 305 *Introduction to Physical Electronics*  
 MATH 381 *Introduction to Partial Differential Equations* or CAAM 336 *Differential Equations in Science and Engineering*  
 CHEM 121/122 *General Chemistry with Laboratory* or CHEM 151/152 *Honors Chemistry with Laboratory*

**Additional courses for the BS degree in physics with option in biophysics:**

PHYS 302 *Intermediate Electrodynamics*  
 PHYS 311/312 *Introduction to Quantum Physics I and II*  
 PHYS 425 *Statistical and Thermal Physics*  
 BIOS 201/202 *Introductory Biology*

**Additional courses for BS degree in physics with option in computational physics:**

PHYS 302 *Intermediate Electrodynamics*  
 PHYS 311/312 *Introduction to Quantum Physics I and II*  
 PHYS 416 *Computational Physics*  
 PHYS 425 *Statistical and Thermal Physics*  
 PHYS 491/492 *Undergraduate Research*  
 PHYS 493/494 *Undergraduate Research Seminar*

(The undergraduate research course and seminar must be taken concurrently.)

MATH 381 *Introduction to Partial Differential Equations* and MATH 382 *Complex Analysis*  
 or CAAM 335 *Matrix Analysis* and CAAM 336 *Differential Equations in Science and Engineering*

**Additional courses for the BS degree in astrophysics:**

PHYS 302 *Intermediate Electrodynamics*  
 PHYS 311 *Introduction to Quantum Physics I*  
 PHYS 425 *Statistical and Thermal Physics*  
 ASTR 230 *Astronomy Laboratory*  
 ASTR 350/360 *Introduction to Astrophysics—Stars, Galaxies, and Cosmology*  
 3 courses from: ASTR 450 *Experimental Space Science*, ASTR 451 *Solar and Stellar Astrophysics*, ASTR 452 *Galaxies and Cosmology*, ASTR 470 *Solar System Physics*,  
 PHYS 312 *Introduction to Quantum Physics II*,  
 PHYS 480 *Introduction to Plasma Physics*

**Additional courses for the BA degree in physics:**

PHYS 302 *Intermediate Electrodynamics*  
 PHYS 311 *Introduction to Quantum Physics I*  
 PHYS 331 *Junior Physics Laboratory I*  
 PHYS 425 *Statistical and Thermal Physics*

BIOS 301 *Biochemistry*

CHEM 121/122 *General Chemistry with Laboratory*  
 or CHEM 151/152 *Honors Chemistry with Laboratory*

CHEM 211/212 *Organic Chemistry*

CHEM 215 *Organic Chemistry Laboratory*

CAAM 210 *Introduction to Engineering Computation*

CAAM 353 *Computational Numerical Analysis*

CAAM 420 *Computational Science I*

1 of: CAAM 452 *Numerical Methods for Partial Differential Equations*, CAAM 453 *Numerical Analysis*, CAAM 520 *Computational Science II*  
 CHEM 121 *General Chemistry with Laboratory*  
 or CHEM 151 *Honors Chemistry with Laboratory*

PHYS 491/492 *Undergraduate Research*

PHYS 493/494 *Undergraduate Research Seminar*

(The undergraduate research course and seminar must be taken concurrently.)

NSCI 230 *Computation in Natural Science* or  
 CAAM 210 *Introduction to Engineering Computation*

CAAM 336 *Differential Equations in Science and Engineering*

CHEM 121 *General Chemistry with Laboratory*

1 additional PHYS or ASTR course (3 credit hours) at 400 level

NSCI 230 *Computation in Natural Science* or CAAM 210 *Introduction to Engineering Computation* or 1 MATH or CAAM course (3 credit hours) at or above 300 level

**Additional courses for the BA degree in astronomy:**

PHYS 302 *Intermediate Electrodynamics*  
 1 of: PHYS 331 *Junior Physics Laboratory I*,  
 NSCI 230 *Computation in Natural Science*  
 or CAAM 210 *Introduction to Engineering*  
*Computation*  
 PHYS 425 *Statistical and Thermal Physics*  
 or CHEM 311 *Physical Chemistry*

**Additional courses for the BS degree in chemical physics:**

CHEM 121/122 *General Chemistry* or  
 CHEM 151/152 *Honors Chemistry*  
*with Laboratory*  
 CHEM 211 *Organic Chemistry*  
 CHEM 212 *Organic Chemistry*  
 or CHEM 360 *Inorganic Chemistry*  
 CHEM 311/312 *Physical Chemistry*  
 PHYS 302 *Intermediate Electrodynamics*  
 2 of: PHYS 311 or 312 *Introduction to*  
*Quantum Physics I or II*, CHEM 415 *Chemical*  
*Kinetics and Dynamics*, and CHEM 430  
*Quantum Chemistry*  
 6 credit hours from: CHEM 215 *Organic Chem-*  
*istry Laboratory*, CHEM 351 or 352

ASTR 230 *Astronomy Laboratory*  
 ASTR 350/360 *Introduction to Astrophysics—*  
*Stars, Galaxies, and Cosmology*  
 ASTR 470 *Solar System Physics*  
 1 of: ASTR 430 *Teaching Astronomy*  
*Laboratory*, ASTR 450 *Experimental Space*  
*Science*, or PHYS 443 *Atmospheric Science*

*Introductory Module in Experimental Chemistry*,  
 CHEM 372–395, CHEM 435 *Methods of Compu-*  
*tational Quantum Chemistry*, and PHYS 331 or  
 332 *Junior Physics Laboratory I or II*; up to 2  
 hours of CHEM 491 *Research for Undergradu-*  
*ates* or PHYS 491/492 *Undergraduate Research*  
 may be counted toward this requirement.

6 credit hours from: NSCI 230 *Computation in*  
*Natural Science*, CAAM 210, *Introduction to*  
*Engineering Computation*, and MATH, or CAAM  
 courses at or above 300 level

**REQUIREMENTS FOR ADVANCED DEGREES**

For general university requirements, see Graduate Degrees (pages 57–58). More detailed information on courses and requirements is available from the Department of Physics and Astronomy.

The master of science teaching requires 30 credit hours of approved course work.

The master of science is a research degree, normally undertaken as the first stage of doctoral study. The MS requires at least 30 credit hours of approved graduate-level studies, including a thesis performed under the direction of a departmental faculty member.

To be eligible for the PhD degree, graduate students must demonstrate to the department their ability to engage in advanced research. This normally is accomplished by successfully completing the work for the MS. Students also must complete 60 credit hours of approved graduate-level study at Rice and produce a research thesis under the direction of a departmental faculty member. At least two years of graduate study are required for the PhD.

**See ASTR and PHYS in the Courses of Instruction section.**

# POLICY STUDIES

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## THE SCHOOL OF SOCIAL SCIENCES

### DIRECTOR

Donald Ostdiek

### DEGREE OFFERED: BA

This interdisciplinary major focuses on policy issues that are of public interest. Students in policy studies evaluate and analyze both the determinants and the effects of policy decisions, gaining an understanding of the policy-making process and acquiring an intellectual base for policy-making skills. The course of study addresses theoretical issues as well as applied and prescriptive policy questions.

Students may take policy studies *only as a 2nd major*. It complements majors in any university department. For instance, engineering or science majors who are contemplating careers in business or government can investigate how technical innovations or regulations are adopted and implemented as matters of public policy, and humanities majors can explore career options where language skills are particularly valuable.

Students are encouraged to investigate research opportunities with Rice faculty. Students also may elect to participate in the Washington Semester Program at American University, which includes both course work and an internship in the federal government, or students may participate in selected Study Abroad programs for course credit, some of which also have internship experiences in foreign settings. See the Policy Studies director for more information.

### DEGREE REQUIREMENTS FOR BA IN POLICY STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). Students may take the policy studies major only as a 2nd major (their 1st major cannot also be in an interdepartmental program). The major contains 11 courses divided into the following elements: a basic curriculum, an area curriculum, and a research requirement.

The policy studies basic curriculum introduces students to the basic concepts and tools needed to understand and study policy, regardless of the policy area on which they choose to focus. The 4 courses ensure that all policy studies majors have a common professional vocabulary and conceptual frame of reference. The policy studies area curriculum provides specialized training that builds on students' work in the basic curriculum.

Students also are required to take 6 courses from 1 of the following areas of specialization or in an area approved by the Policy Studies director:

- Environmental policy
- Government policy and management
- Healthcare management
- International affairs
- Law and justice
- Business policy and management
- Urban and social change

In consultation with the Policy Studies director, each student also must select



a research seminar or complete an approved research project through independent study or other course credit. The Policy Studies Research Seminar (SOSC 400) also counts for this requirement.

#### 4 Basic Curriculum Courses

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ECON 211 or 212 *Principles of Economics I or II*

POLI 337 *Public Policy and Bureaucracy*

POLI 338/SOSC 301 *Policy Analysis*

I advanced analysis or methods course approved by the Policy Studies director

#### 6 Area Curriculum Courses

---

6 courses from 1 of the following  
7 groups (specific course substitutions may be approved by the Policy Studies director)

##### 1. Environmental Policy

(Choose 6)

ANTH 468 *Palaeoclimate and Human Response*

ARCH 313 *Sustainable Architecture*

BIOS 323 *Conservation Biology*

BIOS 325 *Ecology*

CEVE 201 *Introduction to Environmental Systems*

CEVE 306 *Global Environmental Law and Sustainable Development*

CEVE 406 *Introduction to Environmental Law*

ECON 480 *Environmental and Energy Economics I*

ENGL 478 *Literature and the Environment*

ENST 303 *Environmental Problem Solving*

PHYS 203 *Atmosphere, Weather, and Climate*

POLI 331 *Environmental Politics and Policy*

POLI 336 *Politics of Regulation*

RELI 362 *Environmental Ethics*

SOCI 367 *Environmental Sociology*

##### 2. Government Policy and Management

(Choose 6)

ANTH 344 *City/Culture*

CEVE 406 *Introduction to Environmental Law*

ECON 436 *Government Regulation of Business*

ECON 438 *Economics of the Law*

ECON 461 *Urban Economics*

ECON 480 *Environmental and Energy Economics I*

ECON 483 *Public Finance*

HIST 468 *Women and the Welfare State*

POLI 300 *Federalism and Intergovernmental Politics*

POLI 301 *State Politics*

POLI 330 *Minority Politics*

POLI 331 *Environmental Politics and Policy*

POLI 332/432 *Urban Politics*

POLI 335 *Political Environment of Business*

POLI 436 *Politics of Regulation*

POLI 458 *Property Rights and Privatization*

SOCI 308 *Houston: The Sociology of a City*

SOCI 331 *Politics and Society in Texas*

SOCI 350 *Sociological Approaches to Poverty*

SOCI 370 *Sociology of Education*

SOCI 399 *Immigration and Public Health*

SOCI 411 *Social Change*

SOCI 441 *Minorities in the Schooling Process*

SOSC 330 *Healthcare Reform in the 50 States*

SOSC 430 *The Shaping of Health Policy in the United States*

##### 3. Healthcare Policy and Management

(Choose 6)

ANTH 381 *Medical Anthropology*

ANTH 386 *Human Nutrition*

ANTH 388 *Life Cycle: A Biocultural View*

HEAL 212 *Consumer Health*

HEAL 350 *Understanding Cancer*

HEAL 407 *Epidemiology*

HEAL 410 *Program Development in Health Education*

PHIL 315 *Ethics, Medicine, and Public Policy*

RELI 462/463 *Medical Ethics and American Values I and II*

SOCI 334 *Sociology of the Family*

SOCI 345 *Sociology of Medicine*

SOCI 399 *Immigration and Public Health*

SOSC 330 *Healthcare Reform in the 50 States*

SOSC 420 *Healthcare: Competition and Managed Care*

SOSC 430 *The Shaping of Health Policy in the United States*

SPAN 307/308 *The Language of Healthcare*

#### **4. International Affairs (Choose 6)**

ECON 420 *International Economics*

ECON 421 *International Finance*

ECON 430 *Comparative Economic Systems*

ECON 451 *Political Economy of Latin America*

HIST 464 *Foreign Policy Seminar*

HIST 469 *U.S.—Latin America Relation*

POLI 354 *Latin American Politics*

POLI 355 *Government and Politics of the Middle East*

POLI 356 *Politics of Latin American Economic Development*

POLI 360 *West European Democracies*

POLI 372 *American Foreign Policy*

POLI 373 *International Conflict*

POLI 376 *International Political Economy*

POLI 378 *The Politics of American National Security Policy*

POLI 462 *Comparative Public Policy*

POLI 464 *Political Economy of Development*

#### **5. Law and Justice (Choose 6)**

ANTH 326 *Anthropology of Law*

ANTH 419 *Law and Society*

CEVE 406 *Introduction to Environmental Law*

ECON 438/439 *Economics of the Law I and II*

HIST 297/298 *American Legal History I and II*

PHIL 307 *Social and Political Philosophy*

PHIL 316 *Philosophy of Law*

POLI 321 *American Constitutional Law*

POLI 458 *Property Rights and Privatization*

SOCI 321 *Criminology*

#### **6. Business Policy and Management (Choose 6)**

ACCO 305 *Introduction to Accounting*

ECON 355 *Money and Banking*

ECON 370 *Microeconomic Theory*

ECON 375 *Macroeconomic Theory*

ECON 415 *Human Resources, Wages, and Welfare*

ECON 420 *International Economics*

ECON 421 *International Finance*

ECON 435 *Industrial Organization*

ECON 436 *Government Regulation of Business*

ECON 445 *Managerial Economics*

ECON 448 *Corporation Finance*

PSYC 231 *Industrial and Organizational Psychology*

POLI 335 *Political Environment of Business*

POLI 336 *Politics of Regulation*

POLI 376 *International Political Economy*

POLI 458 *Property Rights and Privatization*

POLI 464 *Political Economy of Development*

#### **7. Urban and Social Change (Choose 6)**

ANTH 344 *City/Culture*

ANTH 360 *Modernity and Social Space*

ARCH 311 *Houston Architecture*

ARCH 313 *Sustainable Architecture*

ARCH 321 *Economics of the built Environment*

ARCH 346 *19th- and 20th-Century Architectural History*

ARCH 351 *Social Issues and Architecture*

ARCH 455 *Housing and Urban Programs*

ECON 461 *Urban Economics*

ECON 480 *Environmental Economics*

HART 325 *Art and Architecture in the Middle East*

HIST 429 *Technologies of Nationalism*

PHIL 307 *Social and Political Philosophy*

POLI 332 *Urban Politics*

POLI 438 *Race and Public Policy*

POLI 441 *Common Property Resources*

SOCI 301 *Social Inequality*

SOCI 308 *Houston: The Sociology of a City*

SOCI 309 *Race and Ethnic Relations*

SOCI 310 *Urban Sociology*

SOCI 313 *Demography*

SOCI 411 *Social Change*

# POLITICAL SCIENCE

## THE SCHOOL OF SOCIAL SCIENCES

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Lanny Martin

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### LECTURER

C. M. Hudspeth

## DEGREES OFFERED: BA, MA, PHD

Students majoring in political science are encouraged to achieve both a broad understanding of the field and a specialized knowledge of one or more aspects of political science, including American politics and comparative politics and politics and international relations (see also majors in managerial studies and public policy). Graduate study is grounded in the areas of American politics (public policy, Congress, and intergovernmental relations), comparative politics (Western Europe, Latin America, and political development), and international relations (international conflict).

## DEGREE REQUIREMENTS FOR BA IN POLITICAL SCIENCE

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in political science must complete 30 semester hours (10 courses) in the field of political science, plus 6 hours (2 courses) of upper-level work in any of the following fields: anthropology, economics, history, philosophy, psychology, or sociology. Students select these upper-level courses in consultation with the department advisor.

### Political science degree requirements are as follows:

- At least 1 course in each of the following fields: American politics, comparative politics, international relations, theory, and methods.
- At least 2 of the 4 introductory courses.
- A concentration of at least 4 courses in one of the following fields: American politics, comparative politics, and international relations. These 4 courses must include the introductory course and a seminar.
- A statistics course offered by the Department of Political Science.

- Two seminars, at the 400 or 500 level, with different instructors.
- POLI 110 and 112 do not satisfy any requirement for the political science major

**Introductory Courses**—POLI 209 *Introduction to Constitutionalism and Modern Political Thought*, POLI 210 *American Government and Politics*, POLI 211 *International Relations*, and POLI 212 *Introduction to Comparative Politics* constitute the introductory courses in political science. Students should note, however, that POLI 210 is the course that meets the Texas state licensing requirements in political science for teachers. Students who entered Rice before fall 1999 and choose to stay with the old plan may count no more than 2 of the introductory courses toward their major requirements.

**Directed Readings Courses**—Directed readings courses are intended for students who have completed a substantial number of political science courses and who seek to explore a subject not covered in regular courses. They are available only if an appropriate faculty member agrees to supervise. The faculty member supervising a directed readings course must have a full-time appointment, and a student may not take more than 1 readings course from him or her. Students should submit a brief, 1-page description of the work to be conducted in the readings course (including the name of the faculty supervisor) to the department director of undergraduate studies no later than 2 weeks into the semester in which they intend to take the course. Readings courses do not count toward the department's distribution requirement.

**Honors Program**—Admission to the honors program requires the approval of the department director of undergraduate studies. During the first semester of the 2-semester program, students take a readings course that provides them with a basis for drawing up a thesis prospectus. At the end of the 1st semester, a thesis committee composed of 2 full-time members of the political science department reviews and approves the prospectus. During the 2nd semester, students write their honors thesis, which also must meet with committee approval. Students may not combine the 2 honors courses into 1 semester. Those who successfully complete the honors program may substitute it for 1 of the seminars required for the major. See also Honors Programs (page 26). Failure to complete the 2nd semester of the honors program will result in loss of credit for the 1st semester of the honors program.

Alternatively, students may earn honors in political science by successfully completing the Rice University Honors Program (RUSP), HONS 470/471. In addition to successfully completing this program, the student must complete a research project in political science, and the student must be supervised by a faculty member in the political science department.

## DEGREE REQUIREMENTS FOR MA AND PHD IN POLITICAL SCIENCE

For general university requirements, see Graduate Degrees (pages 57–58). Students in the PhD program must complete 48 semester hours in advanced courses or seminars before candidacy and conclude the degree program with the oral presentation of a dissertation displaying original research. Normally, students take the specified core courses in the three general fields of American

politics, comparative politics, and international relations, completing additional course work and comprehensive examinations in 2 of those 3 fields. Before taking the comprehensive examinations, students must:

- Complete courses in statistical analysis
- Demonstrate some familiarity with traditional political theory
- Satisfy the language or skill requirement in their major field
- Complete all course requirements

Students select specific courses for graduate study in consultation with the faculty advisor.

The master of arts degree can be obtained with 36 semester hours of course work, all of which must be taken at the graduate level (400 level or above), and the completion of 2 research papers in seminars taken over the course of study. A minimum G.P.A. of 3.0 is required for awarding the MA.

The political science department requires that not more than 3 years elapse between the time the student is admitted to graduate study and the completion of the MA degree, unless an extension is approved by the department graduate committee.

**See POLI in the Courses of Instruction section.**

# PSYCHOLOGY

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Xiaohong Denise Chen

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Steven C. Currall

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Richard R. Batsell

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Betty S. Sanders

Angela L. Stotts

Mihriban Whitmore

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Roberta M. Diddel

#### VISITING SCHOLAR

Mary R. Newsome

#### ADJUNCT LECTURER

Rachel Winer Flannery

### RESEARCH FACULTY

#### POSTDOCTORAL RESEARCH

##### ASSOCIATE

Philip C. Burton

Magdalena Grohman

Linda Mortensen

**DEGREES OFFERED: BA, MA, PH** The undergraduate program offers the core preparation recommended by the nation's leading graduate schools of psychology, with advanced courses and research opportunities to fit individual needs. Programs of study may be structured around prospective careers in medicine, law, business, and education as well as in psychology.

Program emphasis in graduate study is on doctoral training. An important feature of our doctoral program is its strong research orientation. Students are expected to spend a good portion of their graduate years actively engaged in research and are expected to acquire a high level of research competence. Faculty research interests and areas of specialization for graduate students include: cognitive psychology (basic mental activities as perceiving, attending, remembering, learning, judging, verbalizing, and imagining), systems and cognitive neuroscience (understanding the relationship between the human brain and higher forms of behavior), human factors/human-computer interaction (the scientific discipline concerned with the understanding of interactions among humans and other elements of a system and the application of theories, principles, data and other methods of design in order to optimize human well-being and overall system performance), industrial and organizational psychology (human behavior in organizational and work situations), perception (psychology of sensory and perceptual systems in humans and animals), social/personality (examines both the way people think about, influence, and interact with others as well as individual differences in people that accentuate such cognitions and behaviors), and training (broad interdisciplinary area drawing on cognitive psychology, industrial/organizational psychology, and educational psychology).

#### **DEGREE REQUIREMENTS FOR BA IN PSYCHOLOGY**

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in psychology must complete 29 semester hours in departmental courses, including the following required courses.

##### **Core Courses**

PSYC 101 *Introduction to Psychology*  
 PSYC 202 *Introduction to Social Psychology*  
 PSYC 203 *Introduction to Cognitive Psychology*  
 PSYC 339 *Statistical Methods—Psychology*  
 PSYC 340 *Research Methods* (no substitutions or transfer credits allowed for PSYC 339 or 340)

**At least 1 course from each block**

##### **Block 1**

PSYC 308 *Memory*  
 PSYC 309 *Psychology of Language*  
 PSYC 350 *Psychology of Learning*  
 PSYC 351 *Psychology of Perception*  
 PSYC 360 *Thinking*  
 PSYC 362 *Biopsychology*

##### **Block 2**

PSYC 321 *Developmental Psychology*  
 PSYC 329 *Psychological Testing*  
 PSYC 330 *Personality Theory*  
 PSYC 331 *The Psychology of Gender*  
 PSYC 332 *Abnormal Behavior*  
 PSYC 352 *The Psychology of Emotion and Motivation*

\*No substitutions or transfer credits allowed to fulfill Block 1 and 2 requirements. Once enrolled at Rice, students must have prior approval from the psychology department to transfer courses taken at another college or university.

Students are encouraged to take PSYC 339 and PSYC 340 as soon as possible, preferably by the end of their sophomore year.

**Honors Program**—Qualified students may apply to the honors program during preregistration in the spring semester of their junior year. A written proposal for the project must be submitted by the end of the second week of classes in fall of the senior year, and the faculty will decide on final admission to the honors program by the end of the 4th week of classes. Admission to the honors program requires a psychology GPA of 3.7 and an overall GPA of 3.5, completion of PSYC 339, and completion or concurrent enrollment in PSYC 340. To graduate with departmental honors, students must complete the requirements for the psychology major, a written honors thesis approved by a faculty committee, and other requirements as determined by their honors committee (see Honors Program, page 26). Detailed information about the honors program is available from the instructor of the course or the departmental office.

#### **DEGREE REQUIREMENTS FOR MA AND PHD IN PSYCHOLOGY**

Students must complete an admission-to-candidacy procedure that should establish their expertise in their chosen specialty. For general university requirements, see Graduate Degrees (pages 57–58). For both MA and PhD degrees, students must complete a research thesis, including a public oral defense, and accumulate 30 semester hours for the MA and 60 hours for the PhD. Course work includes required courses in certain areas, plus whatever offerings are available in the student's specialty area, either cognitive/experimental, industrial/organizational/social, or engineering psychology. Competence in a foreign language is not required.

**See PSYC in the Courses of Instruction section.**



# RELIGIOUS STUDIES

## THE SCHOOL OF HUMANITIES

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Gregory Kaplan

### ADJUNCT PROFESSOR

Stanley J. Reiser

### ADJUNCT ASSOCIATE PROFESSOR

B. Jill Carroll

### VISITING PROFESSOR

Thomas R. Cole

## DEGREES OFFERED: BA, PHD

The undergraduate major includes courses in methodology (textual, historical, normative, and sociocultural approaches to the study of religion) and religious traditions (African religions, Buddhism, Christianity, comparative religions, Hinduism, Islam, and Judaism). For research degrees in the graduate program, see below. Within these clearly defined fields, students acquire a broad knowledge of religious studies with enough flexibility for interdisciplinary pursuits.

## DEGREE REQUIREMENTS FOR BA IN RELIGIOUS STUDIES

For general university requirements, see Graduation Requirements (pages 14–15). In addition, students also must satisfy the distribution requirements and complete no fewer than 60 semester hours outside the departmental requirements for a program totaling at least 120 semester hours. See Distribution Requirements (pages 15–16) and Majors (pages 17–18).

Students majoring or double-majoring in religious studies must complete:

- 30 hours for majors
- 24 hours for double majors
- 18 hours must be selected at 300-level or above
- No more than 2 courses (6 hours) may be transferred from outside the department

The following requirements must be met. For details about the categories of offerings, the departmental list should be consulted. It is updated every semester and can be obtained from the undergraduate advisor.

- Reli 303 *The Craft of Religious Studies*
- 1 course from 2 of these 3 categories of offerings: textual and historical studies; philosophy, ethics, theology, and contemplative studies; and religion and the arts and science
- 1 course *taken in the senior year* from the category of offerings *400-level Senior Seminar*

- 5 elective courses for majors; 3 elective courses for double majors
- To ensure coverage of religious traditions, 2 courses selected in the major must cover 2 of 3 religious traditions (Abrahamic, Asian, African, and African-American)

**Honors Program.** Qualified undergraduates may choose the option of writing a senior thesis. To complete this thesis, the student must elect RELI 400 *Honors in Religious Studies*. Students must have at minimum 3.2 GPA in their religious studies courses before undertaking thesis work, and they must obtain the permission of a faculty advisor who will supervise the project during the senior year.

### DEGREE REQUIREMENTS FOR PHD IN RELIGIOUS STUDIES

The graduate program accepts a limited number of qualified students. A distinguished undergraduate record and high scores on the Graduate Record Examination (GRE) are essential, and an advanced degree in the humanities is desirable. For general university requirements, see Graduate Degrees (pages 57–58). Students admitted into the program normally will receive financial assistance in the form of a tuition waiver and a stipend. As part of their training and in return for their stipends, students in their second year and beyond are expected to perform a minimum amount of services in return for their stipend by assisting the department as needed.

The PhD in religious studies is normally a 5-year program. Course requirements for students without a relevant MA or MDiv (based on 3 courses per semester):

- 18 courses (54 hours required); 36 hours for students with a relevant MA or MDiv
- 2 department seminars to be taken in each of the 1st 2 years
- Passing grades on reading examinations in 2 secondary research languages approved by the faculty before taking qualifying exams.
- Passing grades in 4 qualifying examinations
- Oral discussion of dissertation proposal
- Satisfactory completion of dissertation and oral defense

**Reading Lists**—Reading lists are available for all Qualifying Exams. Students are expected to familiarize themselves with this material enough that they draw on it on their exams and the dissertation itself. The graduate seminar is, in part, an introduction to areas of the reading list and to the techniques for engaging in deep, independent reading.

### PROFESSIONAL DEVELOPMENT

Opportunities may be available to teach undergraduate courses in the department or in local colleges and universities. Limited funds also are available for students to attend conferences to present their research. The department encourages these and other efforts to prepare students for academic careers.

**See RELI in the Courses of Instruction section.**

# SOCIOLOGY

## THE SCHOOL OF SOCIAL SCIENCES

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Holly E. Heard

Rachel Tolbert Kimbro

D. Michael Lindsay

### POSTDOCTORAL FELLOWS

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Melanie Heath

Kristen Schilt

Jason E. Shelton

### DEGREE OFFERED: BA

This undergraduate major fosters an analytic approach to the study of human societies, whether as a preparation for graduate work in sociology and related fields or as the foundation for a variety of occupations. It also is an important component of a liberal arts education and, as such, can serve as effective preparation for professions like law or medicine. The program provides students with considerable latitude in pursuing personal interests while ensuring familiarity with basic theoretical approaches and research methods.

### DEGREE REQUIREMENTS FOR THE BA IN SOCIOLOGY

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in sociology must complete at least 33 semester hours (11 courses) in sociology. Requirements for the major include the following:

SOCI 101 *Introduction to Sociology*

SOCI 298 *Social Statistics*

#### 1 of the following:

SOCI 290 *Research Methods*

SOCI 241 *The Craft of Sociology*

At least 1 theory course, such as:

SOCI 250 *Social Theory*

SOCI 275 *Feminist Social Thought*

Any other sociology courses to reach a total of 11

Sociology majors are not required to take a foreign language, but those planning graduate study should be competent in at least 1 such language. Some sociology courses listed in the Courses of Instruction section may not be offered every year, and courses among the regular offerings are occasionally added or dropped. Students are responsible for making sure they satisfy all the requirements for their degree. One of the sociology faculty, preferably the department advisor should sign each major's registration.

**Honors Program**—For general information, see Honors Programs (page 26). Students who have maintained an A- average in all sociology courses beyond the introductory level may apply to enter the honors program. They should submit their research proposals:

- a) by November 15 of the 1st semester of their junior year, in which case they will research and write their thesis during the 2nd semester of their junior year and the 1st semester of their senior year.
- b) by March 15 of the 2nd semester of their junior year, in which case they will complete their thesis during the 2 semesters of their senior year.

Since departmental awards for seniors are usually determined around March 1, and the honors thesis often is taken into consideration in this determination, students who wish to be considered for these awards are advised to begin their thesis in the spring of their junior year. Research proposals must be carefully thought out and discussed with at least 1 professor before being submitted. Once submitted, they will be considered by the department faculty as a whole and, if acceptable, the student will be assigned a faculty advisor.

Students in the honors program register for 2 successive semesters in Directed Honors Research (SOC 492 and 493). The 1st of the 2 courses is typically devoted to a thorough review of the relevant literature, the formulation of hypotheses growing out of the literature review, and a proposal consisting of a research design that clearly describes how the data are to be collected and analyzed. To receive a grade for the 1st semester, the student must submit a paper to the primary thesis advisor by the last day of classes. This paper must contain the literature review, hypotheses, and research design, along with a bibliography. The research itself usually is carried out in the 2nd semester (and sometimes in the summer following the junior year) and is analyzed, written up, and defended as a completed honors thesis during that semester.

All honors students should complete SOC 390 *Research Methods* or SOC 421 *The Craft of Sociology* before beginning the 2nd semester of the program. If their project requires statistical analysis, students also should complete SOC 398 *Social Statistics* before beginning the 2nd semester of their research.

#### **COURSE REQUIREMENTS FOR A MINOR IN SOCIOLOGY**

6 classes total (18 credits)

*Required Classes:* Introduction to Sociology

1 methods OR theory course

*Elective Classes:* 4 electives (12 credits), including at least 1 400-level class.

**See SOC in the Courses of Instruction section.**

# STATISTICS

## THE GEORGE R. BROWN SCHOOL OF ENGINEERING

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Economics*)

Dennis Cox

Mahmoud El-Gamal (*joint appointment:  
Economics*)

Katherine B. Ensor

Don H. Johnson (*joint appointment:  
Electrical and Computer Engineering*)

Marek Kimmel

Javier Rojo

Rudy Guerra

David W. Scott

Robin Sickles (*joint appointment:  
Economics*)

James R. Thompson

Edward E. Williams (*joint appointment:  
Jones Graduate School of Management*)

Rick K. Wilson (*joint appointment:  
Political Science*)

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Psychology*)

Barbara Ostdiek (*joint appointment:  
Jones Graduate School of Management*)

Rudolph H. Riedi

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Barry W. Brown

Kim-Anh Do

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Valen Johnson

J. Jack Lee

Peter Müller

Gary Rosner

Marina Vannucci

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Kenneth Hess

Yu Shen

Sanjay Shete

Ya-Chen Shih

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Chad A. Shaw

Ilya Shmulevick

Issa F. Zakeri

### LECTURER

L. Scott Baggett

### FACULTY FELLOW

Janet Siefert

### DEGREES OFFERED: BA, MSTAT, MA, PHD

Course work in statistics acquaints students with the role played in the modern world by probabilistic and statistical ideas and methods. Students grow familiar with both the theory and the application of techniques in common use as they are trained in statistical research. The flexibility of the undergraduate program allows students to concentrate on theoretical or applied training, or they may link their studies in statistics to work in other related departments (see majors in economics, education, electrical and computer engineering, computational and applied mathematics, managerial studies, mathematics, political science, and psychology). Graduate study has concentrations in applied probability, bioinformatics, biomathematics, biostatistics, computational finance, data analysis, density estimation, epidemiology, image processing, model building, quality control, statistical computing, spatical processes, stochastic processes, and time series analysis. A joint MBA/master of engineering degree also is available in conjunction with the Jesse H. Jones Graduate School of Management.

## DEGREE REQUIREMENTS FOR BA IN STATISTICS

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in statistics normally complete the following:

- MATH 101/102 *Single Variable Calculus I and II*
- MATH 211 *Ordinary Differential Equations and Linear Algebra*
- CAAM 210 or 211 *Introduction to Engineering Computation*
- STAT 310 *Probability and Statistics*
- STAT 410 *Introduction to Statistical Computing and Regression*
- 6 elective courses from the statistics department (or other departments) with approval from their advisor at the 300 level or higher

Mathematically oriented students should also take MATH 212 *Multivariable Calculus* and MATH 355 *Linear Algebra* (or CAAM 335 *Matrix Analysis*).

The department offers a minor in computational finance jointly with the economics department (see Financial Computation and Modeling minor).

## DEGREE REQUIREMENTS FOR MSTAT, MA, AND PHD IN STATISTICS

For general university requirements, see Graduate Degrees (pages 57–58). Admissions applications should include scores on the Graduate Record Examination (GRE) in the quantitative, verbal, and analytical tests. Financial support is available for well-qualified doctoral students. Course work for all degree programs should be at the 400 level or above, although 2 approved 300-level courses may be accepted.

**Master's Programs**—Candidates for the nonthesis MStat degree must complete 30 semester hours of approved course work. Candidates for the MA degree in statistics must complete 30 semester hours of approved course work as well as 1 of the following: (1) complete an original thesis and defend it in a public oral examination; or (2) perform satisfactorily on the 2nd-year PhD comprehensive examinations.

**PhD Program**—Candidates for the PhD degree in statistics must complete at least 90 semester hours of approved course work beyond the bachelor's degree and a minimum of 60 hours beyond a master's degree, perform satisfactorily on preliminary and qualifying examinations, and complete an original thesis with a public oral defense. All STAT graduate students are assigned a limited amount of teaching and other departmental service as part of their graduate education. The assignment usually entails less than 10 hours per week, averaged over the semester. Students completing the PhD degree in four years will be assigned no more than six semesters of service.

**See STAT in the Courses of Instruction section.**

# THE STUDY OF WOMEN, GENDER, AND SEXUALITY

---

## **DIRECTOR AND ADVISOR**

Rosemary Hennessy

## **PROFESSORS**

Jane Chance

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James D. Faubion

Beatriz González-Stephan

Rosemary Hennessy

Anne C. Klein

Elizabeth Long

Susan Keech McIntosh

Helena Michie

Deborah Nelson-Campbell

Robert L. Patten

Meredith Skura

Ewa M. Thompson

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Scott S. Derrick

Eugenia Georges

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Betty Joseph

Maria-Regina Kecht

Jeffrey J. Kripal

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Caroline F. Levander

Susan Lurie

Nanxiu Qian

Carol E. Quillen

Paula Sanders

Sarah Westphal

Lora Wildenthal

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Krista Comer

Sarah Ellenzweig

Julie Fette

Bridget K. Gorman

Holly Heard

Michelle R. Hebl

Nancy A. Niedzielski

Kirsten Ostherr

Sherrilyn Roush

Elora Shehabuddin

Allison Sneider

## **PROFESSOR OF THE PRACTICE**

Diana L. Strassmann

## **LECTURER**

Thad Logan

## **DEGREES OFFERED: BA AND GRADUATE CERTIFICATE**

Both the undergraduate major and the graduate certificate program take an interdisciplinary approach in their exploration of women's experiences and the role that ideas about sexual differences have played in human societies. Areas of inquiry include women's participation in social and cultural production; the construction of gender roles and sexuality; the relationship between ideas about gender and concepts inherent in other social, political, and legal structures; and the implications of feminist theory for philosophical and epistemological traditions. Students acquire an understanding of how adopting gender as a significant category of analysis challenges existing disciplines. They also gain proficiency in the methods used to study and compare cultural constructions of gender and sexuality, and they become familiar with the ongoing fundamental debates in women's and gender studies.

## **DEGREE REQUIREMENTS FOR BA IN THE STUDY OF WOMEN, GENDER, AND SEXUALITY**

For general university requirements, see Graduation Requirements in this publication. Students majoring in the study of women, gender, and sexuality must complete:

- 36 semester hours of departmental course work (30 hours if this is a 2nd major)

- SWGS 101 *Introduction to the Study of Women, Gender, and Sexuality* or SWGS 201 *Introduction to Lesbian, Gay, Bisexual, and Transgender Studies*
- SWGS 498 and SWGS 499 (capstone courses in fall and spring respectively)
- At least 1 approved non-Western studies course
- At least 1 approved critical race studies course
- At least 1 approved theory course

Of the remaining required courses, no more than 4 courses may be from a single department. All students must work out their individual courses of study with their faculty advisors. Each student's course of study must be approved by the director of the major. Course requirement tracking forms are available in the SWGS office for declared SWGS majors.

The following courses are among those that can be used to fulfill requirements for the major. As course offerings may vary from year to year, students are urged to consult with their faculty advisors or with the director at the beginning of each semester.

Please note that not all courses listed below will be offered during the academic year. For a current list of courses that will be offered in fall 2007 and spring 2008, please visit the SWGS website at [cswgs.rice.edu](http://cswgs.rice.edu).

### **I. Courses that Satisfy the Core Requirements**

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SWGS 101 *Introduction to the Study of Women, Gender, and Sexuality*

SWGS 201 *Introduction to Lesbian, Gay, Bisexual, and Transgender Studies*

SWGS 498 *Research in the Study of Women, Gender, and Sexuality (F)*

SWGS 499 *Research in the Study of Women, Gender, and Sexuality (S)*

### **II. Courses that Satisfy the Non-Western Studies Requirement**

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SWGS 240 *Gender and Politicized Religion*

SWGS 250 *International Political Economy of Gender*

SWGS 283 *Women in the Modern Islamic World*

SWGS 315 *Gender and Islam*

SWGS 323 *The Knowing Body: Buddhism, Gender, and the Social World*

SWGS 340 *Gender and Politicized Religion (enriched version)*

SWGS 399 *Women in Chinese Literature*

SWGS 422 *Gender and Global Economic Justice*

SWGS 455 *Women and Gender in Medieval Islamic Societies*

### **III. Courses that Satisfy the Critical Race Studies Requirement**

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SWGS 234 *U.S. Women's History I: Colonial Beginnings to the Civil War*

SWGS 235 *U.S. Women's History II: Civil War to the Present*

SWGS 370 *Survey of African American Literature*

SWGS 387 *Cultural Studies: Race, Gender, and the Politics of Representation*

SWGS 387 *Cultural Studies*

SWGS 415 *Sociolinguistics*

SWGS 453 *Topics in African American Literature: Black Women Writers*

SWGS 468 *Women and the U.S. Welfare State: Sexual Politics and American Poverty*

### **IV. Courses that Satisfy the Theory Requirement**

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SWGS 303 *Women's Stories and Legal Change*

SWGS 391 *Producing Feminist Knowledge: Methodology and Visual Culture*

SWGS 395 *Feminist Knowledges*

SWGS 430 *Queer Theory*

SWGS434 *French Feminist Theory*

SWGS460 *Feminist Social Thought*

SWGS 480 *Feminist Literary Theory*

SWGS 482 *Problems in Contemporary Feminist Theory*



**V. Other Courses**

SWGS 105 *Language, Gender, and Sexuality*  
 SWGS 130 *Mapping German Culture: Women and National Socialism*  
 SWGS 205 *Language and Society*  
 SWGS 220 *Gendered Perspectives on the Law*  
 SWGS 269 *Murder and Unbelonging in the Literary Imagination*  
 SWGS 301 *Arthurian Literature*  
 SWGS 305 *Chaucer*  
 SWGS 306 *Human Sexuality*  
 SGWS 307 *Sexuality and Christianity*  
 SWGS 324 *Sociology of Gender*  
 SWGS 325 *Sociology of the Family*  
 SWGS 327 *20th-Century Women Writers: Feminist Literatures of Africa and the African Diaspora*  
 SWGS 329 *Literature and Culture of the American West*  
 SWGS 330 *Mapping German Culture: Courtship, Love, and Marriage in the Age of Chivalry*  
 SWGS 331 *The Psychology of Gender*  
 SWGS 332 *Self, Sex, and Society in Ancient Greece*  
 SWGS 335 *The Lifecycle: A Biocultural View*  
 SGWS 342 *Gender, Race, and Technoscience*  
 SGWS 343 *Women and Performance*  
 SWGS 348 *Subjectivity in Modern and Postmodern Art and Thought*  
 SWGS 349 *Women Writers: 1400-1900*  
 SWGS 350 *Gender and Symbolism*  
 SGWS 351 *Coming of Age in a Transnational World*  
 SWGS 358 *Mapping German Culture: European Women Filmmakers*  
 SWGS 361 *New German Cinema*  
 SWGS 365 *Gender, Subjectivity, and the History of Photography*

SWGS 366 *Topics in American Literature*  
 SWGS 368 *Mythologies*  
 SWGS 369 *Seminar on Beauty and Fragmentation in Modern Art*  
 SWGS 372 *Survey of Victorian Fiction*  
 SWGS 389 *Generation X in Literature and Culture*  
 SWGS 390 *Hispanic Cinema*  
 SGWS 398 *Topics in Legal History*  
 SWGS 400 *Constructing Identities in Modern Fiction*  
 SWGS 405 *Austen Only*  
 SWGS 410 *The Literary and Historical Image of the Medieval Woman*  
 SWGS 412 *Women and Women's Voices in French Literature*  
 SWGS 420 *Women and Gender in 19th-Century Europe*  
 SWGS 440 *Women in Music*  
 SWGS 442 *Women in Russian Literature*  
 SWGS 444 *Family Inequality*  
 SWGS 448 *Disease and Difference: The Body in Visual Culture*  
 SWGS 462 *20th-21st-Century American Literary Studies*  
 SWGS 465 *Gender and Health*  
 SWGS 470 *Sex, Sanctity, and Psychoanalysis*  
 WGST 485 *Gender and Hollywood Cinema in the 1950s*  
 SGWS 486 *Medicine and Media*  
 SWGS 495 *Independent Study*  
 SWGS 496 *Applied Women's and Gender Studies*  
 SWGS 498 *Research in the Study of Women and Gender (F)*  
 SWGS 499 *Research in the Study of Women and Gender (S)*

### **REQUIREMENTS FOR GRADUATE CERTIFICATE IN THE STUDY OF WOMEN, GENDER, AND SEXUALITY**

The graduate certificate program in the Study of Women, Gender, and Sexuality (SWGS) is designed to provide interdisciplinary training in the field of women and gender studies to students pursuing a PhD degree at Rice University. Students who have been admitted into a PhD program are eligible to apply to the SWGS graduate certificate program. The SWGS graduate certificate is not a free-standing degree program; in addition to fulfilling the SWGS requirements outlined below, candidates will be required to successfully complete the PhD program in which they have been admitted in order to receive the graduate certificate in SWGS. Further information is available on request from the SWGS office. For PhD requirements, see the relevant department. For general university

requirements, see Graduate Degrees in this publication.

The program awards graduate fellowship stipends, within the limits of available funds, to certificate students during the prospectus-writing semester. Although timelines vary depending on the student's home department, this semester normally occurs during the semester following the completion of coursework and before passing the qualifying examinations in the PhD program. During the prospectus-writing semester, graduate certificate students will be enrolled in SWGS 502 *Gender, the Disciplines, and Interdisciplinarity*. Graduate certificate students will be eligible to work as teaching assistants for an SWGS undergraduate core or cross-listed course, or in some cases, to teach a course of their own upon approval of the steering committee.

For the graduate certificate in SWGS, candidates must complete:

- 9 credit hours of courses in SWGS, including 2 core courses (SWGS 501 and SWGS 502) and 1 cross-listed elective course (see list of approved courses below)
- 3 noncredit hours for participation in annual colloquium

SWGS certificate students are strongly encouraged to include a member of the SWGS faculty on their dissertation committee and to consult regularly with the faculty member as they pursue their dissertation work.

The following courses are those that can be used to fulfill requirements for the graduate certificate. In most cases, students will be able to complete these requirements within the normal time limits for coursework in their PhD program. All students must work out their individual courses of study with the SWGS director and the graduate advisor in their home department. Each student's course of study must be approved by the SWGS director. Please note that not all courses listed below will be offered during the academic year. For a current list of courses that will be offered in fall 2007 and spring 2008, please visit the SWGS website at [cswg.rice.edu](http://cswg.rice.edu).

### **I. Courses that Satisfy the Core Graduate Certificate Requirements**

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SWGS 501 *Feminist Debates*

SWGS 502 *Gender, the Disciplines, and Interdisciplinarity*

### **II. Courses that Satisfy the Cross-listed Elective Course Requirement**

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SWGS 503 *Directed Reading*

SWGS 517 *Medieval Women Writers*

SWGS 520 *Shakespeare and Difference*

SWGS 522 *Feminist Economics*

SWGS 525 *Self, Sex, and Society in Ancient Greece*

SWGS 542 *Victorian Fiction*

SWGS 545 *Women and Gender: Europe and Beyond*

SWGS 546 *20th Century British Literature*

SWGS 551 *U.S. Women's History*

SWGS 556 *Seminar in Language Variation*

SWGS 576 *Topics in U.S. Women's History*

SWGS 577 *Buddhism, Gender, Society*

SWGS 580 *Sex, Sanctity, and Psychoanalysis*

SWGS 581 *Studies in Sexuality: Thinking Sex under Neo-Liberalism*

SWGS 585 *Postcolonialism and After*

### **III. Annual Colloquium Requirement**

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Graduate certificate students will participate in a colloquium involving a series of speakers over the course of a year, to be offered annually at Rice and organized by SWGS. Colloquium attendance by graduate certificate students constitutes an official requirement for the certificate. Colloquium topics will be determined by the SWGS Steering Committee with a view to highlighting emerging knowledge in the field of women's studies. The colloquium will provide graduate students with the opportunity to engage in sustained intellectual exchange with leading women's studies scholars and to participate in cutting edge work in the field.

# SUBSURFACE GEOSCIENCE

## THE WIESS SCHOOL OF NATURAL SCIENCES

### **DIRECTORS**

Alan Levander  
Dale S. Sawyer

### **PROFESSORS**

John B. Anderson  
Andrew R. Barron  
André W. Droxler  
Katherine B. Ensor

### **ASSOCIATE PROFESSORS**

Gerald R. Dickens  
Julia Morgan  
Colin A. Zelt

### **ASSISTANT PROFESSORS**

Brandon Dugan  
Fenglin Niu

### **ADJUNCT PROFESSOR**

Steve H. Danbom

### **LECTURER**

W. C. Rusty Riese

### **DEGREES OFFERED: MS**

Rice University introduced the professional master's degree in subsurface geoscience in fall 2003. This degree is designed for students who wish to become proficient in applying geological knowledge and geophysical methods to finding and developing reserves of oil and natural gas. Students can specialize in one of three focus areas: information technology, geology, and geophysics. The information technology focus area prepares students to apply IT principles to the rapidly growing industry need to store, access, and interpret very large and diverse geological, geophysical, cultural, and infrastructural datasets. The geology focus area prepares students to be explorationists, with strong skills in using seismic and other geophysical methods along with geological principles to find oil and natural gas. The geophysics focus area prepares students to become technical experts in aspects of exploration seismology.

The subsurface geoscience degree is 1 of 3 tracks in the Professional Master's Program at Rice housed in the Wiess School of Natural Sciences. These master's degrees are designed for students seeking to gain further scientific core expertise coupled with enhanced management and communication skills. These degrees instill a level of scholastic proficiency that exceeds that of the bachelor's level, and they create the cross-functional aptitudes needed in modern industry. This program will allow students to move more easily into management careers in consulting or research and development, design, and/or marketing within oil-and gas-related industries.

### **DEGREE REQUIREMENTS FOR MS IN SUBSURFACE GEOSCIENCE**

In addition to core science courses, students are required to complete a 3- to 6-month internship and take a set of cohort courses focusing on business and communication. Students select a group of elective courses from 1 of 3 focus areas: geology, geophysics, or information geology. Students must present their internship project in both oral and written form in the Professional Master's Seminar.

Part-time students who already work in their area of study may fulfill the internship requirement by working on an approved project with their current employer. For general university requirements for graduate study, see pages 56-58, and see also Professional Degrees, page 58.

**ADMISSION**

Admission to graduate study in subsurface geoscience is open to qualified students holding a bachelor's degree in science that includes course work in general chemistry, physics, calculus, differential equations, and linear algebra. Department faculty evaluate the previous academic record and credentials of each applicant individually.

**Science core courses:**

- ESCI 415 *Petroleum Geology* (S)  
 ESCI 417 *Petroleum Industry Economics and Management* (S)  
 ESCI 420 *Modern Industrial Exploration Techniques* (S)  
 ESCI 440 *Geophysical Data Analysis: Digital Signal Processing* or  
 ESCI 441 *Geophysical Data Analysis: Inverse Theory*  
 ESCI 441 *Geophysical Data Analysis* (F)

- ESCI 442 *Exploration Geophysics I* (F)  
 ESCI 444 *Exploration Geophysics II* (S)

**Cohort courses:**

- NSCI 610 *Management in Science and Engineering* (F)  
 NSCI 501 *Professional Master's Seminar* (F, S)  
 [required for 2 semesters]  
 NSCI 511 *Science Policy and Ethics* (S)  
 NSCI 512 *Professional Master's Project* (ES)

**INTERNSHIP**

An internship may be conducted under the guidance of a host company, government agency, or national laboratory. A summary of the internship project is required in both oral and written form as part of the Professional Master's Project.

**ELECTIVE COURSES**

NOTE: Each of these electives is not offered every year, and some courses may have prerequisites or require instructor permission.

Students will choose 4 electives. Recommended courses include, but are not limited to, the following:

**Information Technology**

- COMP 429 *Introduction to Computer Networks* (S)  
 ESCI 454 *Geographic Information Science* (F)  
 STAT 310 *Probability and Statistics* (F, S)  
 STAT 410 *Introduction to Statistical Computing and Computer Models* (F, S)

**Geology Focus Area**

- ESCI 427 *Seismic Sequence Stratigraphy* (S)  
 ESCI 428 *Interpretation of Reflection Seismograms* (F)  
 ESCI 450 *Remote Sensing* (S)  
 ESCI 463 *Advanced Structural Geology* (F)  
 ESCI 467 *Geomechanics* (F)  
 ESCI 470 *Quantitative Hydrogeology* (S)  
 ESCI 504 *Siliciclastic Depositional Systems* (F)  
 ESCI 505 *Applied Sedimentology* (F)  
 ESCI 506 *Carbonate Depositional Systems* (S)

**Geophysics Focus Area**

- CENG 571 *Flow and Transport through Porous Media I* (S)  
 ESCI 427 *Seismic Sequence Stratigraphy* (S)  
 ESCI 428 *Interpretation of Reflection Seismograms* (F)  
 ESCI 454 *Geographic Information Science* (F)  
 ESCI 461 *Seismology I* (F)  
 ESCI 467 *Geomechanics* (F)  
 ESCI 542 *Seismology II* (F)

**Additional Electives**

- CAAM 378 *Introduction to Operations Research* (F)  
 ECON 486 *Energy Economics* (S)  
 CEVE 322 *Engineering Economics for Engineers* (F)  
 NSCI 625 *New Venture Creation for Science and Engineering* (S)

MGMT 617 *Managerial Decision Making* (S)

MGMT 636 *Systems Analysis and  
Database Design*

MGMT 661 *International Business Law* (S)

MGMT 674 *Production and Operations  
Management* (F)

MGMT 676 *Project Management/Project  
Finance* (S)

MGMT 721 *General Business Law* (S)

### **PROFESSIONAL SCIENCE MASTER'S 5TH YEAR DEGREE OPTION FOR RICE UNDERGRADUATES**

Rice students have an option to achieve the MS in subsurface geoscience by adding an additional 5th year to the 4 undergraduate years of science studies. Advanced Rice students in good standing apply during their junior year, then start taking required core courses of the subsurface geoscience program during their senior year. A plan of study based on their particular focus area will need to be approved by the track director and the PSM coordinator.

## UNIVERSITY COURSES

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University courses provide opportunities for dialogue across disciplinary and departmental boundaries. They are an experiment in curriculum development, directed toward students interested in interdisciplinary subjects beyond their elected major.

**See UNIV in the Courses of Instruction section.**

# VISUAL AND DRAMATIC ARTS

## THE SCHOOL OF HUMANITIES

### CHAIR

Karin Broker

### PROFESSORS

Basilios Poulos

George Smith

Geoff Winningham

### ASSOCIATE PROFESSORS

Brian Huberman

Darra Keeton

John Sparagana

### ARTIST TEACHERS

Gary Feuge

Paul Hester

### LECTURERS ON THEATRE

Trish Rigdon

Matthew Schlieff

### VISITING LECTURER

Jim Huston

Paige Willson

### RICE CINEMA DIRECTOR & LECTURER ON FILM & MEDIA STUDIES

Charles Dove

### DEGREES OFFERED: BA

Department of Visual and Dramatic Arts majors are students who declare a major in the studio arts (drawing, digital video and film production, painting, photography, printmaking, sculpture) or theatre arts tracks. Each student should discuss with their faculty advisor the selection of courses and any other matters of concern in the student's academic life, such as study and travel abroad, scholarships and internships, career goals or options, etc.

Graduating senior visual and dramatic arts majors and double majors are required to participate in the annual student art exhibition and/or theatre production held during commencement week.

### DEGREE REQUIREMENTS FOR BA IN VISUAL AND DRAMATIC ARTS

For general university requirements, see Graduation Requirements (pages 14-15).

#### *Bachelor of Arts in Visual and Dramatic Arts Single Major Studio Art Track (12 courses required)*

ARTS 225 *Basic Drawing* (ARTS 101 accepted as equivalent)

ARTS 205 *Photography I* or ARTS 327  
*Documentary Production*

ARTS 301 *Painting*, or ARTS 325 *Life Drawing*,  
or ARTS 340 *Color Drawing*

ARTS 311 *Intaglio I* or ARTS 365 *Sculpture I*

6 elective courses in studio (ARTS) or theatre  
(THEA) arts (may include no more than 3  
theatre arts courses)

2 courses in art, film, or theatre criticism/theory  
or art history (HART)

NOTE: Open selections qualified by course  
prerequisites and in consultation with a visual  
and dramatic arts faculty advisor.

#### *Theatre Track (12 courses required)*

ARTS 225 *Basic Drawing* (ARTS 101 accepted as  
equivalent)

THEA 100 *Theatre Technology* or THEA 101  
*Costume/Clothing Construction*

THEA 300 *Introduction to Theatre Design* or  
THEA 301 *Acting I*

THEA 303 *Introduction to Theatre*

6 elective courses; 3 in theatre (THEA) and 3 in  
studio art (ARTS)

2 courses in art, film, or theatre theory/criticism,  
dramatic literature, or art history (HART)

NOTE: Open selections qualified by course  
prerequisites and in consultation with a visual  
and dramatic arts faculty advisor.

**Bachelor of Arts in Visual and Dramatic Arts**  
**Double Major**  
**Studio Art Track**  
**(10 courses required)**

ARTS 225 *Basic Drawing* (ARTS 101 accepted as equivalent)

ARTS 205 *Photography I* or ARTS 327 *Documentary Production*

ARTS 301 *Painting* or ARTS 325 *Life Drawing* or

ARTS 311 *Intaglio I* or ARTS 365 *Sculpture I*

ARTS 340 *Color Drawing*

4 courses in studio (ARTS) or theatre (THEA) arts (may include no more than 1 theatre arts courses)

2 courses in art, film, or theatre criticism/theory or art history (HART)

NOTE: open selections qualified by course prerequisites and in consultation with a visual and dramatic arts faculty advisor.

**Theatre Track**  
**(10 courses required)**

ARTS 225 *Basic Drawing* (ARTS 101 accepted as equivalent)

THEA 100 *Theatre Technology* or THEA 101 *Costume/Clothing Construction*

THEA 300 *Introduction to Theatre Design* or THEA 301 *Acting I*

THEA 303 *Introduction to Theatre*

4 elective courses; 2 in theatre (THEA) and 2 in studio art (ARTS)

2 courses in art, film, or theatre theory/criticism, dramatic literature, or art history (HART)—

NOTE: open selections qualified by course prerequisites and in consultation with a visual and dramatic arts faculty advisor.

In addition to the above requirements, visual and dramatic arts majors and double majors are required to take a 1 credit hour senior exhibition/theatre project class during their senior year, ARTS 499 *Special Problems: Senior Exhibition/Theatre Production Project*, prior to the annual senior art exhibition held during commencement week. Students must speak with their visual arts faculty advisor and receive written permission to enroll in ARTS 499.

### TRANSFER CREDIT

No more than 2 courses may be transferred for the single or double major to satisfy degree requirements for BA in visual and dramatic arts degree. The 2 transfer credit courses must be in studio or theatre practice required for all majors. Advanced placement credit may not be used by visual and dramatic arts majors to fulfill department degree requirements.

Entering transfer students who are transferring course work from another accredited college or university will be allowed to transfer their undergraduate art courses. Students must speak with the Visual and Dramatic Arts chair immediately upon transferring to Rice.

See also Transfer Credit in the Information for Undergraduate Students section of the *General Announcements*.

### EXHIBITIONS, LECTURES, AND ARTS PROGRAMS AT RICE

The Department of Visual and Dramatic Arts mounts several art and photography exhibitions and stage productions each year. In addition exhibitions and related activities organized by the Rice Art Gallery enrich the teaching program of the Department of Visual and Dramatic Arts, as well as the larger university and Houston communities.

The department enjoys an ongoing close relationship with local theatres, museums, and galleries. The department offers opportunities for students to work and study with local art venues and alternative art spaces by way of collaborative events and programs. The collections and exhibitions of local



museums often are the subject of course lectures. Lectures, symposia, and talks are sponsored by the department and are designed to bring local, national, and international scholars, actors, directors, critics, and studio artists to campus to speak on a broad range of topics and current interests.

international scholars, actors, directors, critics, and studio artists to campus to speak on a broad range of topics and current interests.

### **MUSEUM OF FINE ARTS, HOUSTON, GLASSSELL SCHOOL OF ART CORE FELLOWS**

The Department of Visual and Dramatic Arts, in partnership with the Museum of Fine Arts, Houston, Glassell School of Art, supports up to 6 Glassell Core Fellowship recipients each year to teach studio practice and critical theory courses. These Core Fellowship recipients, selected by the MFAH from the highly competitive and prestigious Glassell School of Art Core Fellowship Residency Program, are postgraduate artists and art educators.

### **RICE THEATRE PROGRAM**

The Rice Theatre Program curriculum offers a solid foundation in all aspects of theatrical production, from acting and directing to technology and design, for students who wish to pursue a professional career in theatre or continue on to a graduate program. Theatre courses also are open to nonmajors who want to gain a greater appreciation for the art of theatre.

There are two main-stage productions and two student showcases offered each year in Hamman Hall—a 500 seat proscenium theatre facility. Participation in productions is open to all students currently enrolled in theatre courses as well as students who have taken theatre courses as nonmajors. The end of semester showcases feature the work of students currently enrolled in theatre courses.

Theatre Program faculty are actively involved in professional theatre and film locally, nationally, and internationally and actively pursue opportunities to involve advanced students in that work. In addition, advanced students are encouraged to apply for internship positions whenever possible. Rice students have been accepted in competitive internships such as the Alley Theatre, Berkeley Repertory Theatre, Williamstown Theatre Festival, and the Peter Hall Company. In addition, students are encouraged to study theatre abroad and to transfer course credit back to Rice. Approval for transfer credit must be sought prior to enrollment in a study-abroad program by contacting the director of the Theatre Program.

In even number years, the Theatre Program, sponsored by the Alan and Shirley Grob Endowment for Shakespeare in Performance, hosts the Actors from the London Stage—one of the oldest established touring Shakespeare theater companies in the world—for a week-long residency of workshops, performances, and lectures. Each tour presents a full-length play by Shakespeare performed by five classically trained actors who come from such prestigious companies as the Royal Shakespeare Company; the Royal National Theatre of Great Britain; and Shakespeare's Globe Theatre.

### **RICE CINEMA**

Rice Cinema, a public alternative film program, is intimately connected with the

curriculum both in film and media studies (HART) and in film and photography production (ARTS) and includes frequent guest lecturers, panel discussions, and media events.

Operating for 35 years, Rice Cinema has screened cult films and revivals as well as festivals and retrospectives. Founded as an integral part of the visual arts, Rice Cinema's mission has long crossed boundaries to bring people together to promote scholarly dialogue and cross-cultural interaction. The legendary vision of the de Menil family, Roberto Rossellini, Colin Young, and James Blue is fulfilled by the presence of this unique program on campus.

Each year the cinema screens films from around the world, including foreign features, shorts, documentaries, and animation. Rice Cinema reaches beyond the university's hedges to the diverse communities of Houston. It offers a living alternative to the monolithic commercial cinema of Hollywood and screens films from every continent. Among the internationally known filmmakers who have appeared on campus over the years are Werner Herzog, Rakhshan Banietamad, Atom Egoyan, Shirin Neshat, Martin Scorsese, Andy Warhol, George Lucas, and Dennis Hopper.

Rice Cinema works in concert with academic programs to enrich students' undergraduate experience. Students are provided state-of-the-art screening facilities to examine and study the historical and methodological aspects of movies from around the world in 16, 35, or 70 millimeter with Dolby Digital Sound. Film production students can showcase their work during the academic year on the new silver screen in recently renovated projection facilities.

**See ARTS, HART, and THEA in the Courses of Instruction section for course descriptions.**



**Courses of Instruction**

## COURSES OF INSTRUCTION

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The course list printed in this catalog is current as of May 6, 2006. For the up-to-date list, please visit:

**<http://esther.rice.edu/catalog.html>**

### COURSE TYPE DEFINITIONS

**Cross-listed** courses share the same title, credit, description, meeting time and days, instructor, and attributes, including repeatability and distribution, etc.

**Equivalent courses** may share the same attributes like title, description credit, and meeting time, but they do not necessarily share all course information.

**Graduate/Undergraduate equivalency** courses are the graduate/undergraduate versions of courses.

Students may not receive credit for cross-listed, equivalent, or graduate/undergraduate equivalency courses taken at the same time. If the course is not repeatable, students may not receive credit for cross-listed, equivalent, or graduate/undergraduate equivalency courses taken in different semesters.

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**ACCO (ACCOUNTING)**

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**Jones School of Management/Management****ACCO 305 INTRODUCTION TO ACCOUNTING (3)**

Survey of basic accounting theory and practice with emphasis on the primary problems of asset valuation and income determination. Not open to first year students (freshmen). Limited enrollment. Offered Fall & Spring. Instructor(s): Zeff; Widener.

**ACCO 406 COST ACCOUNTING (3)**

Uses of accounting data to plan and evaluate long-run investment and financing decisions and short-run price, costing, output, and financing decisions of the business firm or public entity. Pre-requisite(s): ACCO 305 and ECON 211. Offered Fall. Instructor(s): Roman.

**ACCO 497 INDEPENDENT STUDY (3)**

Independent study on an approved project under faculty supervision. Not offered this academic year.

**ACCO 498 INDEPENDENT STUDY (3)**

See ACCO 497. Not offered this academic year.

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**AFSC (AIR FORCE SCIENCE)**

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**No College Designated/Air Force Science****AFSC 101 FOUNDATION OF THE USAF I (2)**

Overall roles and missions of the USAF; career fields available. Emphasis on military customs and courtesies, appearance standards, core values, written and personal communications. Introduction to American military history. Offered Fall. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Chapman.

**AFSC 102 FOUNDATION OF THE USAF II (2)**

Continuation of AFSC 101. Offered Spring. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Chapman.

**AFSC 201 EVOLUTION OF AIR POWER (2)**

Key historical events and milestones in the development of air power as a primary instrument of United States national security. Core values and competencies of leaders in the United States air power. Tenets of leadership and ethics. Offered Fall. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Mack.

**AFSC 202 EVOLUTION OF AIR POWER II (2)**

Continuation of AFSC 201. Offered Spring. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Mack.

**AFSC 301 AIR FORCE LEADERSHIP STUDIES I (3)**

Leadership, management fundamentals, professional knowledge, Air Force personnel and evaluation systems, and leadership ethics. Case studies of Air Force leadership and management situations. Department permission required. Offered Fall. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Bossert.

**AFSC 302 AIR FORCE LEADERSHIP STUDIES II (3)**

Continuation of AFSC 301. Department permission required. Offered Spring. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Bossert.

**AFSC 381 FIELD TRAINING (8)**

No military obligation is associated with this course. Four-week off-campus field training practicum. Introduces students to Air Force leadership. Places students in demanding and stressful leadership positions. Department permission required. Offered Summer. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Bossert.

**AFSC 401 NATIONAL SECURITY AFFAIRS I (3)**

Evolution of the role of national security in a democratic society with emphasis on policy formation, competing values, and organization. Civilian control of the military, roles of the services; functions of the Air Force Commands. Department permission required. Offered Fall. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Kusiak.

**AFSC 402 NATIONAL SECURITY AFFAIRS II (3)**

Continuation of AFSC 401. Department permission required. Offered Spring. URL: [www.uh.edu/afrotc](http://www.uh.edu/afrotc). Instructor(s): Kusiak.

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**ANTH (ANTHROPOLOGY)**

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**School of Social Sciences/Anthropology****ANTH 200 INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE (3)**

Overview of the scientific study of the structure and function of language. Introduces the main fields of linguistics: phonetics, phonology, morphology, syntax, semantics, discourse, historical linguistics, sociolinguistics, and psycholinguistics. Highlights the interdisciplinary relationship of linguistics with anthropology, sociology, psychology, and cognitive sciences. Cross-listed with LING 200. Offered Fall. Instructor(s): Crosswhite.

**ANTH 201 INTRODUCTION TO SOCIAL/CULTURAL ANTHROPOLOGY (3)**

Introduction to the history, methods, and concepts of social/cultural anthropology, which is devoted to the systematic description and understanding of cultural diversity in human societies. Limited enrollment. Offered Spring. Instructor(s): Georges.

**ANTH 203 HUMAN ANTIQUITY: AN INTRODUCTION TO PHYSICAL ANTHROPOLOGY AND PREHISTORY (3)**

This course offers a broad introduction to the human past as revealed by evolutionary studies of both biochemical and fossil evidence, and by archaeological studies of human cultural behavior. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 205 INTRODUCTION TO ARCHAEOLOGY (3)**

An introduction to the elementary concepts of the discipline through a series of case studies. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 210 ANTHROPOLOGY OF DEATH (3)**

An introduction to anthropological and archaeological concepts and methods through a study of rituals surrounding death, dying, and disposal of the dead. Topics will include the definition of death, remembering and forgetting the dead, grief and mourning, tombs and funerary monuments, human sacrifice, forensic reconstructions. Not offered this academic year. Instructor(s): S. McIntosh, Ninetto

**ANTH 235 NANOTECHNOLOGY: CONTENT AND CONTEXT (3)**

Nanotechnology is science and engineering resulting from the manipulation of matter's most basic building blocks: atoms and molecules. This course is designed for humanities and science students who want to explore the content of nanotechnology, (e.g., the methods of visualization, experimentation, and manufacture, and technical feasibility) with the social context of nanotechnology (issues of ethics, regulation, risk assessment, history, funding, intellectual property, controversy and conflict). Preference will be given to freshmen and sophomore students. Register for CHEM 235 to receive Group 3 distribution credit; register for ANTH 235 to receive Group 2 distribution credit. You may receive credit only for one group, not both. Cross-listed with CHEM 235, HIST 237. Limited enrollment. Offered Fall. URL: [www.frazier.rice.edu/nanotech](http://www.frazier.rice.edu/nanotech). Instructor(s): Kulinowski; Kely.

**ANTH 280 ANTHROPOLOGY OF THE MIDDLE EAST (3)**

This course provides an introduction to and critical examination of the extensive ethnographic literature written by sociocultural anthropologist on the peoples and cultures of the Middle East (including North Africa). Major themes of this literature are reviewed and analyzed, and current trends are studied by reading recent works. Not offered this academic year.

**ANTH 290 THE HISTORY AND ETHNOGRAPHY OF THE (TO BE NAMED) (3)**

This course focuses intensively on the history and ethnography of a single people, the selection of which changes from year to year. Using all available materials, this course provides an introduction to the approaches of the discipline and how they have changed, registered by the different ways anthropologists and others have represented the same subjects over time. Not offered this academic year.

**ANTH 298 BIOTECHNOLOGY, 1900 TO NOW (3)**

The technical manipulation of living matter from humans, animals, and plants is both a scientific and a social undertaking. This course is designed for humanities and science students who want to know more about how biotechnology came into existence, and the questions, controversies and changes that come with the ability to engineer living things. A series of case studies of contemporary events in cloning, patenting, genetically modified organisms, and stem cell research will be set in the context of the 20th century history of biotechnology. Limited enrollment. Offered Spring. URL: [www.owl.net.rice.edu/~anth298/](http://www.owl.net.rice.edu/~anth298/). Instructor(s): Landecker.

**ANTH 300 LINGUISTIC ANALYSIS (3)**

A hands-on, data-oriented approach to how different languages construct words and sentences. Students will develop skills in linguistic problem solving and the foundations for pursuing grammatical description. Topics: word classes, morphology, tense-aspect-modality, clause structure, word order, grammatical relations, existentials/possessives/locatives, voice/valence, questions, negation, relative clauses, complements causatives. Cross-listed with LING 300. Graduate/Undergraduate version: ANTH 500. Pre-requisite(s): ANTH 200 or LING 200. Offered Fall. Instructor(s): Englebretson.

**ANTH 301 PHONETICS (3)**

Introductory study of sound as it relates to speech and sound systems in the world's languages. Speech sounds are examined in terms of production mechanisms (articulatory phonetics), propagation mechanisms (acoustic phonetics), and perception mechanisms (auditory phonetics). Includes a basic introduction to Digital Signal Processing. Cross-listed with LING 301. Graduate/Undergraduate version: ANTH 501. Pre-requisite(s): ANTH 200 or LING 200 or permission of instructor. Offered Fall. Instructor(s): Niedzielski.

**ANTH 302 ANTHROPOLOGICAL THEORY: A SURVEY (3)**

A survey of the major theorists and theoretical schools of social-cultural anthropology. Strongly recommended for majors. Offered Fall. Instructor(s): Ninetto Exploration of the nature of language change. Topics covered include sound change syntactic and semantic change, modeling language splits, the sociolinguistics of language change, and the history of European languages. Cross-listed with LING 305. Graduate/Undergraduate version: ANTH 505. Prerequisite(s): ANTH 300 and ANTH 311 OR LING 300 and LING 311 or permission of instructor. Offered alternate years. Instructor(s): Bownern.

**ANTH 308 HISTORY AS A CULTURAL MYTH (3)**

Explores ideas of history and attitudes toward the past as culturally conditioned phenomena. Emphasizes history as a statement of cultural values as well as conceptualizations of cause, change, time, and reality. Cross-listed with SWGS 336. Graduate/Undergraduate version: ANTH 508. Not offered this academic year.

**ANTH 309 GLOBAL CULTURES (3)**

This course will examine specific cultural debates and issues that have "overflowed" national boundaries. Topics will include student movements, democracy and citizenship, and the internationalization of professional and popular culture. Graduate/Undergraduate version: ANTH 509. Not offered this academic year.

**ANTH 310 CONTEMPORARY CHINESE CULTURE (3)**

This introductory course is designed to encourage ways of thinking about: Cultural China--a broad-ranging concept that includes the People's Republic of China, the newly established Special Administrative Region (SAR) of Hong Kong, the Republic of China on Taiwan, and overseas Chinese communities throughout the world. Not offered this academic year.

**ANTH 311 MASCULINITIES (3)**

This course deals with masculinities in the West, concentrating on concepts of masculine protagonism and personhood. Readings explore identities constructed in realms such as law, politics, finances, art, the home, and war. Cross-listed with SWGS 333. Graduate/Undergraduate version: ANTH 511. Not offered this academic year.

**ANTH 312 AFRICAN PREHISTORY (3)**

Thematic coverage of developments throughout the continent from the Lower Paleolithic to medieval times, with emphasis on food production, metallurgy and the rise of cities and complex societies. Graduate/Undergraduate version: ANTH 512. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 313 LANGUAGE AND CULTURE (3)**

Investigates the relation between language and thought, language and worldview, language and logic. Cross-listed with LING 313. Graduate/Undergraduate version: ANTH 513. Offered Spring. URL: [www.owlnet.rice.edu/~ANTH313](http://www.owlnet.rice.edu/~ANTH313). Instructor(s): Tyler.

**ANTH 314 GENETICS: SCIENCE AND SOCIETY (3)**

The course uses an interdisciplinary perspective to examine the claims and counter-claims made regarding genetics and new technologies for identifying and manipulating genetic material. The course will cover biological basics of genes, DNA, and epigenesis; cultural and historical aspects of approaches to genetics, including eugenics past and present; and ethical issues arising from new genetic technologies. Cross-listed with BIOS 307. Limited enrollment. Offered Spring. Instructor(s): S. McIntosh; Georges; Novotny.

**ANTH 315 INTRODUCTION TO THE ANTHROPOLOGY OF INFORMATION AND NETWORKS (3)**

History and social study of information and network technologies. Thematic focus on communication, exchange, information/knowledge production and institutions of property and contract law. Empirical topics include networking technologies, money and financial institutions, free software and open source, cryptography, standards bodies, history of the internet, patents, copyright, trademark, and contract law. Includes North America, Europe, and South Asia. Graduate/Undergraduate version: ANTH 515. Offered Fall. Instructor(s): Kely.

**ANTH 316 CULTURAL ANALYSIS (3)**

This course is specifically intended for lower level undergraduates as a means of gaining familiarity with the analytical tradition of cultural anthropology from the beginning of the Twentieth Century. The course is intended to provide students with background for upper level courses in the department. Not offered this academic year.

**ANTH 319 SYMBOLISM AND POWER (3)**

This course considers anthropological theories of the state and examines ethnographic accounts of states in some unexpected places--that is, outside the official realm of government bureaucracies and institutionalized politics. Topics include so-called "stateless societies," planning and bureaucratic rationality, violence and power, and ethnographic methods for studying the state. Graduate/Undergraduate version: ANTH 519. Offered Spring. Instructor(s): Ninetto.

**ANTH 320 PUBLIC SPHERES AND PUBLIC CULTURES (3)**

This course will discuss some of the basic issues surrounding civil society and the public sphere. It will look at specific contemporary debates in public culture, such as multiculturalism, identity politics, and the crisis of contemporary liberalism. Graduate/Undergraduate version: ANTH 520. Offered Spring. Instructor(s): Kely.

**ANTH 321 TEXT AS PROPERTY, PROPERTY AS TEXT: ACROSS THE AGES (3)**

Examines forms and norms of authorship and ownership from antiquity to the present. What is an author? Is a text public or private property? What are the licit/illicit forms of rewriting and appropriating a text, and how are those forms defined? This class investigates historically these and other issues. Cross-listed with CLAS 311. Not offered this academic year. URL: [smatter.rice.edu/321/](http://smatter.rice.edu/321/). Instructor(s): Kely; McGill.

**ANTH 322 CULTURES AND IDENTITIES: RACE, ETHNICITY, AND NATIONALISM (3)**

How do cultural conceptions of race, ethnicity, and nationalism shape who we think we are? How are these ideas related to Western views of the relations between nature and society, and how do these differ from those in other cultures? Graduate/Undergraduate version: ANTH 522. Not offered this academic year.

**ANTH 323 INTRODUCTION TO PHONOLOGY (3)**

Introduction to analysis techniques and theory concerning patternings of sounds in the world's languages. The course will involve extensive work with non-English data sets and development of analytical techniques such as identification of sound alternations or restrictions, and formalization of abstract representations and rules to account for them. Cross-listed with LING 311. Pre-requisite(s): ANTH 200 or ANTH 301 or permission of instructor. Offered Spring. Instructor(s): Crosswhite; Niedzielski.

**ANTH 325 SEX, SELF, AND SOCIETY IN ANCIENT GREECE (3)**

An introductory venture into conducting fieldwork in the past. The course treats a wide range of artifacts, from philosophical essays to vase paintings. It derives its focus from a rich corpus of recent research into the ancient problemization of desire and self-control. Cross-listed with SWGS 332. Graduate/Undergraduate version: ANTH 525. Not offered this academic year. Instructor(s): Faubion.

**ANTH 326 THE ANTHROPOLOGY OF LAW (3)**

Social conflict and methods of dispute management in Western and non-Western societies. Comparison of legal institutions in band, tribal, early state, and complex industrial societies. Not offered this academic year.

**ANTH 327 GENDER AND SYMBOLISM (3)**

Examinations of beliefs concerning men, women, and gender in different cultures, including the West, relating to issues of symbolism, power, and the distribution of cultural models. Cross-listed with SWGS 350. Graduate/Undergraduate version: ANTH 527. Not offered this academic year.

**ANTH 328 VIOLENCE, TERROR, AND SOCIAL TRAUMA (3)**

This course addresses the central place of violence in our society and its relations with social and political terror in other cultures. Readings, film, and theater probe everyday violence as well as spectacular events of our times. Aftermath, including cross-generational trauma, will be explored. Graduate/Undergraduate version: ANTH 528. Not offered this academic year.

**ANTH 329 BODIES, SENSUALITIES, AND ART (3)**

Cross-cultural approaches to art and the senses. Students may engage any medium. Emphasis to be placed on issues generated from performance in the arts rather than from academia. Contrasts art and academic knowledge to explore alternative epistemologies and aesthetics. Graduate/Undergraduate version: ANTH 529. Not offered this academic year.

**ANTH 331 ART AND ARCHAEOLOGY OF THE ANCIENT NEAR EAST (3)**

An in-depth examination of the art and archaeology of ancient Mesopotamia, Syria, Anatolia, and Persia. Beginning in The Neolithic period, we will examine the development of Near Eastern art and architecture through the study of ancient sites and their associated material culture. Cross-listed with HART 311.

**ANTH 335 ANTHROPOLOGY AS CULTURAL CRITIQUE (3)**

The critical assessment and interpretation of Euroamerican social institutions and cultural forms have always been an integral part of anthropology's intellectual project. This course will explain the techniques, history, and achievements of such critique. It will also view the purpose in the context of a more generational tradition of critical social thought in the West, especially the U.S. Graduate/Undergraduate version: ANTH 535. Not offered this academic year.

**ANTH 338 READING POPULAR CULTURE (3)**

The course examines a number of cases from popular genres—romance, novels, television sit-coms, tourist sites, movies, rock music and submits them to a variety of theoretical approaches from disciplines such as anthropology, sociology, literary studies, and philosophy. Graduate/Undergraduate version: ANTH 538. Not offered this academic year.

**ANTH 343 NEW RELIGIOUS MOVEMENTS IN AFRICA (3)**

Discusses new religious movements and the religious, sociological, and political factors leading to their rise, also missionary and colonial reactions to them. Examines their relationship to indigenous religions, political praxis, and their focus on this-worldly salvation in the wake of political and economic marginality. Cross-listed with RELI 342. Offered Spring. Instructor(s): Bongmba.

**ANTH 344 CITY/CULTURE (3)**

The course treats both the theorization and the ethnographic exploration of the urban imaginary; urban spaces and practices; urban, suburban, and post-urban planning; city-states, colonial cities, and capital cities; and the late 20th century metropolis. Graduate/Undergraduate version: ANTH 544. Not offered this academic year.

**ANTH 345 THE POLITICS OF THE PAST: ARCHAEOLOGY IN SOCIAL CONTEXT (3)**

An examination of the way that archaeological evidence of the past has been used and viewed by particular groups at different times. Using case studies, the course considers issues of gender, race, Eurocentrism, political domination and legitimacy that emerge from critical analysis of representations of the past by archaeologists, museums, and collectors. Graduate/Undergraduate version: ANTH 545. Offered Spring. Instructor(s): S. McIntosh.



**ANTH 347 THE U.S. AS A FOREIGN COUNTRY (3)**

This course looks at selected aspects of American culture and society from an anthropological point of view. Readings derive from the works of both foreign and native observers, past and present. Graduate/Undergraduate version: ANTH 547. Not offered this academic year. Instructor(s): Faubion.

**ANTH 351 CULTURES OF NATIONALISM (3)**

This course will examine the cultural dimensions of nationalism, particularly around the creation of forms of "peoplehood" that seem to be presupposed by almost all nation-building projects. Texts to be analyzed will include the Declaration of Independence, the United States Constitution, and the Declaration of the Rights to Man. Graduate/Undergraduate version: ANTH 551. Not offered this academic year.

**ANTH 353 CULTURES OF INDIA (3)**

Summary of the prehistory, ethnography, and ethnology of the Indian subcontinent. Special emphasis on Hinduism, Buddhism, and Indian philosophy. Graduate/Undergraduate version: ANTH 553. Offered Fall. Instructor(s): Tyler.

**ANTH 355 LANDSCAPE ARCHAEOLOGY (3)**

This course provides an overview of the way archaeologists study landscapes including studies that emphasize their ecological, symbiotic, political economic and religious aspects. Recent theoretical work on landscape will be emphasized, as well as archaeological methods of investigation and interpretation, including remote sensing, surveying, and GIS. Graduate/Undergraduate version: ANTH 555.

**ANTH 358 THE FOURTH WORLD: ISSUES OF INDIGENOUS PEOPLE (3)**

In contrast with people self-identified within political structures of the First, Second and Third Worlds, Fourth World peoples are, generally speaking, "stateless peoples". In this course, we will examine both how this "unofficial" status affects their struggle for self-determination and how native peoples engage traditional beliefs and practices for self-empowerment. Through readings, films and speakers we will examine current conflicts facing indigenous people in North and South America, the Soviet Union, Europe, Asia, and Australia. Graduate/Undergraduate version: ANTH 558. Not offered this academic year.

**ANTH 361 LATIN AMERICAN TOPICS (3)**

This is an introductory course designed for students interested in all or some of the following topics: Latin America, popular culture and cultural production, the study of cultural aspects of processes of globalization and Cultural Anthropology. Not offered this academic year.

**ANTH 362 ARCHAEOLOGICAL FIELD TECHNIQUES (3)**

Methods used in fieldwork, laboratory analysis, and interpretation of archaeological data from a local site excavated by the class. Graduate/Undergraduate version: ANTH 562. Pre-requisite(s): ANTH 205. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 363 EARLY CIVILIZATIONS (3)**

A comparative study of the civilizations of Mesopotamia, Egypt, the Indus, China, and the Maya, emphasizing the causes and conditions of their origins. Graduate/Undergraduate version: ANTH 563. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 364 HISTORICAL ARCHAEOLOGY FIELD TECHNIQUES (3)**

In this course, basic field archaeology techniques are taught on-site in an historical archaeology context; with emphasis on excavation methods, artifact recovery, and recording techniques. Students will excavate stone structures and a variety of historical deposits. Fieldwork takes place in Senegal, June-July. Graduate/Undergraduate version: ANTH 564. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 366 SCIENCE, LOCAL AND GLOBAL (3)**

This course explores science as a transnational phenomenon, focusing on the pathways along which it flows around the world. Topics include differences in local styles of reasoning, dynamics of international scientific collaborations, transnational migration of knowledge workers, the role of science in nationalist projects, and the commodification of science. Graduate/Undergraduate version: ANTH 566. Not offered this academic year. Instructor(s): Ninetto.

**ANTH 367 HUMAN EVOLUTION (3)**

Covers the fossil evidence for the evolution of primates and hominids, insights into early hominid behavior from comparative studies in primate ecology and behavior, and how evolution has shaped contemporary human diversity and behavior. Pre-requisite(s): ANTH 203 or BIOS 202 or BIOS 344. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 368 PRIMATOLOGY (3)**

An introduction to primate diversity, ecology, and sociality based on what is now known from field studies of wild primate populations. Not offered this academic year.

**ANTH 370 ARCHAEOLOGICAL LABORATORY TECHNIQUES AND ANALYSIS (3 TO 6)**

Techniques of processing, conserving, and recording archaeological materials are emphasized. Students will become familiar with procedures for pottery, glass, metals, and building materials in addition to plant and animal remains. Course work includes lectures, hands-on lab work, and informal discussion. Lab takes place in Senegal, June-July. Graduate/Undergraduate version: ANTH 570. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 371 MONEY AND EVERYDAY LIFE (3)**

Money is such a part of everyday modern life that it is hard for us to imagine living without it. Yet in many pre-modern societies, gift-exchange was as important as money is in our own. This course will look at the cultural dimensions of systems of exchange, ranging from gift giving among Northwest Coast Indians to foreign currency exchanges between financial institutions. Along with the classic work of Marx and Simmel on money and capital, we will also cover some of the anthropological work on gifts and exchange, such as that of Mauss, Levi-Strauss, and Bourdieu, as well as some of the contemporary debates initiated by Bataille and Derrida. Graduate/Undergraduate version: ANTH 571. Not offered this academic year.

**ANTH 372 CULTURES OF CAPITALISM (3)**

Most of us think of capitalism as primarily an economic phenomenon. Yet, it also has a profoundly cultural dimension that includes culturally specific forms of risk taking, speculation, and even money and capital. This course will explore contemporary phenomenon such as speculation, booms and busts, and the stock market, and use them to discuss some of the classic work on the "cultures of capitalism", including Marx, Simmel, Kracauer, and contemporary writers such as Jameson, DeBord and Virillio. This is not an introductory course in economics, but will look at how people talk and write about culture and capitalism. Graduate/Undergraduate version: ANTH 572. Not offered this academic year.

**ANTH 373 THE LINGUISTIC TURN: LANGUAGE, NARRATION, AND MODERNITY (3)**

This course will look at the role of narration and the construction of some of the basic forms of modernity and post-modernity, ranging from nationalism to performative approaches to identity. The first half of the course will introduce the basic linguistic tools necessary to analyze a variety of cultural materials, and the second half will be devoted to analyzing specific texts and student presentations. The course does not presuppose any technical training in linguistic or literary analysis. Cross-listed with LING 373. Graduate/Undergraduate version: ANTH 573. Not offered this academic year.

**ANTH 375 ABRACADABRA: LANGUAGE AND MEMORY IN SCIENCE AND TECHNOLOGY (3)**

The history of language, writing, and formal notational systems in science and technology. Includes ancient and renaissance arts of memory, universal languages and the development of the calculus, secret writing and cryptography, the graphical method, the rise of the 'scriptural' mode of DNA, the development and use of programming languages, psychoanalysis. No technical knowledge is assumed. Graduate/Undergraduate version: ANTH 575. Limited enrollment. Not offered this academic year. URL: [www.kelty.rice.edu/375/index.html](http://www.kelty.rice.edu/375/index.html). Instructor(s): Kelty.

**ANTH 379 GIFTS AND CONTRACTS (3)**

This course uses philosophical, literary, and economic approaches to examine the role that gifts and contracts play in everyday life and in constructing society and culture. Authors discussed include: Derrida, Marx, Mauss, David Lewis, Schelling, Von Neumann and Morgenstern. Graduate/Undergraduate version: ANTH 579. Not offered this academic year.

**ANTH 381 MEDICAL ANTHROPOLOGY (3)**

Cultural, ecological, and biological perspectives on human health and disease throughout the world. Graduate/Undergraduate version: ANTH 581. Limited enrollment. Offered Spring. Instructor(s): Georges.

**ANTH 383 HUMAN ADAPTATION (3)**

Explanations for the range and patterns of human biological differences in the context of theories of adaptation. Integrates themes from human genetics, physiology, and cultural studies. Graduate/Undergraduate version: ANTH 583. Not offered this academic year.

**ANTH 386 MEDICAL ANTHROPOLOGY OF FOOD AND HEALTH (3)**

Food is increasingly understood and manipulated at the molecular level and used in therapy or disease prevention. This course focuses on the fluid intersection of biomedicine and nutrition as changes in agriculture, food safety, and research into the physiological and genetic effects of food alter how Western cultures eat. Offered Spring. Instructor(s): Landecker.

**ANTH 388 THE LIFE CYCLE: A BIOCULTURAL VIEW (3)**

The human life cycle from conception to death. Focus is on the interaction between biological processes and culture. Cross-listed with SWGS 335. Graduate/Undergraduate version: ANTH 588. Not offered this academic year. Instructor(s): Georges.

**ANTH 390 CULTURE, NARRATION, AND SUBJECTIVITY (3)**

This course examines how linguistic and narrative structures interact to produce specific cultures of interpretation. The focus will be on linguistic and literary representations of subjectivity. This course will use novels by Western authors, such as Virginia Woolf and Dostoevsky, and some Chinese materials as comparison. Graduate/Undergraduate version: ANTH 590. Not offered this academic year.

**ANTH 395 CULTURES AND COMMUNICATION (3)**

Investigates the relations between different forms of communication - speech, print, film and cultural constructions such as audiences, publics, and communities. Graduate/Undergraduate version: ANTH 595. Not offered this academic year.

**ANTH 402 SYNTAX AND SEMANTICS (3)**

Study of semantic categories and their formal expression in morphological, syntactic, and lexical units and patterns. Cross-listed with LING 402. Not offered this academic year.

**ANTH 403 ANALYZING PRACTICE (3)**

A critical review of work informed by what has sometimes been deemed the "key concept" of anthropological theory and research since the 1960s. Special attention will be devoted to the analytics of practice developed by Foucault, by Bourdieu, and by de Certeau. Graduate/Undergraduate version: ANTH 603. Not offered this academic year. Instructor(s): Faubion.

**ANTH 404 INDEPENDENT STUDY (1 TO 9)**

Directed reading and preparation of written papers on anthropological subjects not offered in the curriculum and advanced study of subjects on which courses are offered. Repeatable for Credit. Offered Fall & Spring.

**ANTH 406 COGNITIVE STUDIES (3)**

Relations between thought, language, and culture. Special emphasis given to natural systems of classification and the logical principles underlying them. Cross-listed with LING 406. Graduate/Undergraduate version: ANTH 606. Offered Spring. Instructor(s): Tyler.

**ANTH 407 LINGUISTIC FIELD METHODS (5)**

Techniques and practice in the observation, analysis, and recording of a human language. Cross-listed with LING 407. Recommended prerequisite(s): ANTH 300, ANTH 301, LING 304, and permission of instructor. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Bownen.

**ANTH 408 LINGUISTIC FIELD METHODS (5)**

Continuation of ANTH 407 or LING 407. Cross-listed with LING 408. Pre-requisite(s): ANTH 407 or LING 407. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Bownen.

**ANTH 409 AUTHORSHIP AND OWNERSHIP (3)**

A course on the relations that bind persons to particular things or ideas as property. Looks at forms of ownership as embodied by patents, copyright, brand names and trademarks, and explores how such laws, marks and names function as useful anthropological objects. Graduate/Undergraduate version: ANTH 609. Not offered this academic year.

**ANTH 410 THE ETHNOGRAPHY OF DEVELOPMENT (3)**

This course suggests the necessity of a solid ethnographic grounding for both practical development work and for further intellectual growth of the discipline. Offered occasionally. Graduate/Undergraduate version: ANTH 610. Not offered this academic year.

**ANTH 411 NEUROLINGUISTICS (3)**

Study of languages and the brain. Includes localization of speech, language, and memory functions, hemispheric dominance, pathologies of speech and language associated with brain damage, and hypotheses of the representation and operation of linguistic information in the cortex. Cross-listed with LING 411. Offered Fall. Instructor(s): Lamb.

**ANTH 412 RHETORIC (3)**

Overview of classical theories. Intensive discussion of contemporary theories and applications in a wide variety of disciplines. Cross-listed with LING 410. Graduate/Undergraduate version: ANTH 612. Offered Spring. Instructor(s): Tyler.

**ANTH 413 POSTSOCIALISM (3)**

Examines cultural transformations in the late- and post- socialist societies of East-Central Europe, the former Soviet Union, and Asia. Explores everyday discourses and practices through which new forms of property, selfhood, nationalism, and the state are emerging, and the legacy of cold war politics for ethnographic representation of these societies. Graduate/Undergraduate version: ANTH 613. Limited enrollment. Not offered this academic year. Instructor(s): Ninetto.

**ANTH 414 HERMENEUTICS AND LINGUISTIC ANTHROPOLOGY (3)**

Application of linguistic theory and method in the analysis of cultural materials. Includes discourse analysis and the structure and interpretation of texts and conversation. Cross-listed with LING 414. Graduate/Undergraduate version: ANTH 614. Offered Fall. Instructor(s): Tyler.

**ANTH 415 THEORIES OF MODERNITY/POSTMODERNITY (3)**

An advanced course for graduate students and undergraduate majors with interests in the interdisciplinary field of cultural studies. Readings in the work of Marx, Weber, and Durkheim, Saussure, Gadamer, Derrida, Bakhtin, Foucault, and others. Graduate/Undergraduate version: ANTH 615. Not offered this academic year. Instructor(s): Faubion.

**ANTH 418 CAN HUMANS THINK? ANTHROPOS, HUMANISM AND TECHNOLOGY (3)**

An upper level reading and research seminar that combines readings in the history of humanism with empirical and theoretical issues from the present. Texts and topics from Kant to JCR Licklider on anthropos and humanism, and examples from current debates: genetic engineering, environmentalism, interfaces and networking technologies, testing technologies, and intellectual property regimes. Emphasis on the three R's. Graduate/Undergraduate version: ANTH 618. Not offered this academic year. Instructor(s): Kelyt.

**ANTH 419 LAW AND SOCIETY (3)**

In addition to focusing on works associated with critical legal studies and its antecedent legal realism, the course will examine a number of cases in the international domain that challenge concepts of civil society arising with the modern nation-state. Graduate/Undergraduate version: ANTH 619. Not offered this academic year.

**ANTH 421 AUSTRALIAN LANGUAGES (3)**

A course on the structure of Australian languages examining the phonological, morphological, and syncretic systems. Emphasis placed on interaction with original data and making appropriate typological generalizations. Discussion of sociolinguistics, language use, language death and revitalization. Cross-listed with LING 425. Pre-requisite(s): ANTH 200 or LING 200 or permission of instructor. Offered Spring. Instructor(s): Bower.

**ANTH 423 AFRICAN MYTHS AND RITUAL (3)**

Explore and analyze specific myths and rituals which provide legitimation for community ceremonies and that serve as a basis for the negotiation of power and ideology for members within that community. Readings from classic theorists: Durkheim, Levi-Strauss, Edmond Leach, Gennap and Turner, and contemporary theorists: Werbner, Heusch, Comaroff, and Ray. Cross-listed with RELI 423. Offered Spring. Instructor(s): Bongmba.

**ANTH 425 ADVANCED TOPICS IN ARCHAEOLOGY (3)**

Seminar on selected topics in archaeological analysis and theory. The course will variously focus on ceramic analysis and classification, archaeological sampling in regional survey and excavation, and statistical approaches to data analysis and presentation. Please consult with the department for additional information. Graduate/Undergraduate version: ANTH 625. Pre-requisite(s): ANTH 205 and ANTH 362. Repeatable for Credit. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 430 EXPERIMENTAL WRITING (3)**

This workshop-style class focuses on ethnographic writing. Through readings that experiment with representation, multiple intensive writing assignments, and editing others' work, students develop their own prose skills. Not a technical writing course, but one that engages the question of representation in anthropology. Graduate/Undergraduate version: ANTH 630. Repeatable for Credit. Offered Spring. Instructor(s): Landecker.

**ANTH 440 ANTHROPOLOGY OF THE LIFE SCIENCES (3)**

This course focuses on anthropology of the life sciences. We will examine how this work takes contemporary biology as a site for cultural analysis, and the allied proposals that this represents an opportunity to renovate classic anthropological analyses and categories of kinship, reproduction, the body, life, death and identity. Graduate/Undergraduate version: ANTH 640. Offered Fall. Instructor(s): Landecker.

**ANTH 446 ADVANCED TOPICS IN BIOMEDICAL ANTHROPOLOGY (3)**

Seminar on contemporary research on the biomedical aspects of human health and disease. Includes topics from medical ecology and epidemiology. Graduate/Undergraduate version: ANTH 646. Prerequisite(s): ANTH 381 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Georges.

**ANTH 447 MODERN ETHNOGRAPHY AND THE ETHNOGRAPHY OF MODERNITY (3)**

The course explores the strategies of representation, the methodologies, and the diagnostic categories to which anthropologists have resorted in coming to terms with such phenomena as rationalization, economic and informational globalization, and the commodification of culture. Graduate/Undergraduate version: ANTH 647. Not offered this academic year.

**ANTH 450 ANTHROPOLOGY IN THE CONTEMPORARY WORLD: A SEMINAR FOR MAJORS (3)**

This seminar is designed specifically for juniors and seniors who have declared anthropology as a major, and is intended as an opportunity for them to survey the various applications and points of relevance of anthropology in the rapid transformations of contemporary societies and cultures. It is meant to both assess and challenge the forms of knowledge that anthropology has produced since its inception as a discipline. Not offered this academic year.

**ANTH 455 INTRODUCTION TO SCIENCE AND TECHNOLOGY STUDIES (3)**

Introduction to the historical and social aspects of science and technology. Directed towards providing social scientists ways to understand the role of science and technology in their field sites and research projects; with additional emphasis on the use of media and internet technologies for qualitative social science research. Graduate/Undergraduate version: ANTH 655. Limited enrollment. Offered Spring. URL: [kelty.rice.edu/455/index.html](http://kelty.rice.edu/455/index.html). Instructor(s): Kelty.

**ANTH 458 HUMAN OSTEOLOGY (3)**

Introduction to the analysis of human skeletal material from archaeological sites. Graduate/Undergraduate version: ANTH 658. Limited enrollment. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 460 ADVANCED ARCHAEOLOGICAL THEORY (3)**

History and analysis of the major currents of archaeological theory from the Encyclopaedist origins of positivism, through cultural evolutionism and historical particularism, to the New Archaeology and current trends. Graduate/Undergraduate version: ANTH 660. Pre-requisite(s): ANTH 205. Not offered this academic year.

**ANTH 463 WEST AFRICAN PREHISTORY (3)**

Seminar providing in-depth consideration of the later prehistoric archaeology (late Stone Age and Iron Age) of the West African subcontinent. Graduate/Undergraduate version: ANTH 663. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 468 PALAEOCLIMATE AND HUMAN RESPONSE (3)**

Palaeoscientists have records extending through the Holocene of forcing processes, such as climate, that influence humans. We examine these records and their impact on past and present society. We explore the concept of social memory, used to understand how past communities use information about climate change and past responses in long-term adaptive strategies. Graduate/Undergraduate version: ANTH 668. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh; Droxler.

**ANTH 474 ADVANCED SEMINAR ON THE PREHISTORIC LANDSCAPE (3)**

The interaction of human geography (cultural ecology) and the physical landscape (geomorphology and physical geography) as applied to past and present settlement on major floodplains. Graduate/Undergraduate version: ANTH 674. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 475 PLIO-PLEISTOCENE CLIMATE CHANGE AND HOMINID ADAPTATION (3)**

Junctures in the evolution of the hominids appear to coincide with shifts in the earth's climate record. We will explore the current status of our knowledge of global climate in the Plio-Pleistocene and of the hominid record from the end of the Miocene to the appearance of *H. sapiens*. Graduate/Undergraduate version: ANTH 675. Offered Spring. Instructor(s): S. McIntosh; Droxler.

**ANTH 483 SEMINAR ON DOCUMENTARY AND ETHNOGRAPHIC FILM (4)**

Overview of the history of documentary and ethnographic cinema from a worldwide perspective. Includes both canonical and alternative films and film movements, with emphasis on the shifting and overlapping of boundaries of fiction and nonfiction genres. Cross-listed with HART 483. Graduate/Undergraduate version: ANTH 683. Not offered this academic year.

**ANTH 490 DIRECTED HONORS RESEARCH (1 TO 3)**

A two-semester sequence of independent research culminating in the preparation and defense of an honors thesis. Open only to candidates formally accepted into the honors program. Instructor permission required. Offered Fall.

**ANTH 491 DIRECTED HONORS RESEARCH (3)**

A two-semester sequence of independent research culminating in the preparation and defense of an honors thesis. Open only to candidates formally accepted in the honors program. Instructor permission required. Offered Spring.

**ANTH 495 ANTHROPOLOGY CAPSTONE (3)**

Required of all anthropology majors who do not enroll in ANTH 490 and ANTH 491. Each student formulates and completes an advanced research project guided by a faculty supervisor and evaluated by a faculty panel. Offered Spring.

**ANTH 500 LINGUISTIC ANALYSIS (3)**

Cross-listed with LING 500. Graduate/Undergraduate version: ANTH 300. Offered Fall.

**ANTH 501 PHONETICS (3)**

Cross-listed with LING 501. Graduate/Undergraduate version: ANTH 301. Offered Fall.

**ANTH 505 HISTORICAL LINGUISTICS (3)**

Cross-listed with LING 505. Graduate/Undergraduate version: ANTH 305.

**ANTH 506 HISTORY OF ANTHROPOLOGICAL IDEAS (3)**

An introduction to the history of anthropology and its theories and methods. The emphasis is upon social and cultural anthropology. Offered Fall. Instructor(s): Ninetto.

**ANTH 507 ANTHROPOLOGICAL DIRECTIONS FROM SECOND WORLD WAR TO PRESENT (3)**

A sequel to ANTH 306/506, the course explores turns and trends in sociocultural research and critique during the past half-century. Special attention is paid to the rise and fall of structuralism, the problematization of "the primitive", and the proliferation of theories of "practice". Offered Spring. Instructor(s): Faubion.

**ANTH 508 HISTORY AS CULTURAL MYTH (5)**

Graduate/Undergraduate version: ANTH 308. Not offered this academic year.

**ANTH 509 GLOBAL CULTURES (3)**

Graduate/Undergraduate version: ANTH 309. Not offered this academic year.

**ANTH 511 MASCULINITIES (3)**

Graduate/Undergraduate version: ANTH 311. Not offered this academic year.

**ANTH 512 AFRICAN PREHISTORY (3)**

Graduate/Undergraduate version: ANTH 312. Repeatable for Credit. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 513 LANGUAGE AND CULTURE (3)**

Cross-listed with LING 513. Graduate/Undergraduate version: ANTH 313. Repeatable for Credit. Offered Spring. URL: [www.owl.net.rice.edu/~anth313](http://www.owl.net.rice.edu/~anth313). Instructor(s): Tyler.

**ANTH 515 INTRODUCTION TO THE ANTHROPOLOGY OF INFORMATION AND NETWORKS (3)**

Graduate/Undergraduate version: ANTH 315. Offered Fall. Instructor(s): Kely.

**ANTH 519 SYMBOLISM AND POWER (3)**

Graduate/Undergraduate version: ANTH 319. Offered Spring. Instructor(s): Ninetto.

**ANTH 520 PUBLIC SPHERES AND PUBLIC CULTURES (3)**

Graduate/Undergraduate version: ANTH 320. Offered Spring. Instructor(s): Kely.

**ANTH 522 CULTURES AND IDENTITIES: RACE, ETHNICITY, AND NATIONALISM (3)**

Graduate/Undergraduate version: ANTH 322. Not offered this academic year.

**ANTH 523 INTRODUCTION TO PHONOLOGY (3)**

Cross-listed with LING 511.

**ANTH 525 SEX, SELF, AND SOCIETY IN ANCIENT GREECE (3)**

Cross-listed with SWGS 525. Graduate/Undergraduate version: ANTH 325. Not offered this academic year. Instructor(s): Faubion.

**ANTH 527 GENDER AND SYMBOLISM (3)**

Graduate/Undergraduate version: ANTH 327. Not offered this academic year.

**ANTH 528 VIOLENCE, TERROR AND SOCIAL TRAUMA (3)**

Graduate/Undergraduate version: ANTH 328. Not offered this academic year.

**ANTH 529 BODIES, SENSUALITIES, AND ART (3)**

Graduate/Undergraduate version: ANTH 329. Not offered this academic year.

**ANTH 535 ANTHROPOLOGY AS CULTURAL CRITIQUE (3)**

Graduate/Undergraduate version: ANTH 335. Not offered this academic year.

**ANTH 538 READING POPULAR CULTURE (3)**

Graduate/Undergraduate version: ANTH 338. Not offered this academic year.

**ANTH 544 CITY/CULTURE (3)**

Graduate/Undergraduate version: ANTH 344. Not offered this academic year.

**ANTH 545 THE POLITICS OF THE PAST: ARCHAEOLOGY IN SOCIAL CONTEXT (3)**

Graduate/Undergraduate version: ANTH 345. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 547 THE U.S. AS A FOREIGN COUNTRY (3)**

Graduate/Undergraduate version: ANTH 347. Not offered this academic year. Instructor(s): Faubion.

**ANTH 551 CULTURES OF NATIONALISM (3)**

Graduate/Undergraduate version: ANTH 351. Not offered this academic year.

**ANTH 553 CULTURES OF INDIA (3)**

Graduate/Undergraduate version: ANTH 353. Repeatable for Credit. Offered Fall. Instructor(s): Tyler.

**ANTH 555 LANDSCAPE ARCHAEOLOGY (3)**

This course provides an overview of the way archaeologists study landscapes including studies that emphasize their ecological, symbolic, political economic and religious aspects. Recent theoretical work on landscape will be emphasized, as well as archaeological methods of investigation and interpretation, including remote sensing, surveying, and GIS. Graduate/Undergraduate version: ANTH 355.

**ANTH 558 THE FOURTH WORLD: ISSUES OF INDIGENOUS PEOPLES (3)**

Graduate/Undergraduate version: ANTH 358. Not offered this academic year.

**ANTH 562 ARCHAEOLOGICAL FIELD TECHNIQUES (3)**

Graduate/Undergraduate version: ANTH 362. Repeatable for Credit. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 563 EARLY CIVILIZATIONS (3)**

Graduate/Undergraduate version: ANTH 363. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 564 HISTORICAL ARCHAEOLOGY FIELD TECHNIQUES (3)**

Graduate/Undergraduate version: ANTH 364. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 566 SCIENCE, LOCAL AND GLOBAL (3)**

Graduate/Undergraduate version: ANTH 366. Not offered this academic year. Instructor(s): Ninetto.

**ANTH 570 ARCHAEOLOGICAL LABORATORY TECHNIQUES AND ANALYSIS (3 TO 6)**

Graduate/Undergraduate version: ANTH 370. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh.

- ANTH 571 MONEY AND EVERYDAY LIFE (3)**  
Graduate/Undergraduate version: ANTH 371. Not offered this academic year.
- ANTH 572 CULTURES OF CAPITALISM (3)**  
Graduate/Undergraduate version: ANTH 372. Not offered this academic year.
- ANTH 573 THE LINGUISTIC TURN: LANGUAGE, NARRATION, AND MODERNITY (3)**  
Graduate/Undergraduate version: ANTH 373. Not offered this academic year.
- ANTH 575 ABRACADABRA: LANGUAGE AND MEMORY IN SCIENCE AND TECHNOLOGY (3)**  
Graduate/Undergraduate version: ANTH 375. Not offered this academic year. URL: [www.kelty.rice.edu/375/index.html](http://www.kelty.rice.edu/375/index.html). Instructor(s): Kelty.
- ANTH 579 GIFTS AND CONTRACTS (3)**  
Graduate/Undergraduate version: ANTH 379. Not offered this academic year.
- ANTH 581 MEDICAL ANTHROPOLOGY (3)**  
Graduate/Undergraduate version: ANTH 381. Limited enrollment. Offered Spring. Instructor(s): Georges.
- ANTH 583 HUMAN ADAPTATION (3)**  
Graduate/Undergraduate version: ANTH 383. Not offered this academic year.
- ANTH 586 MEDICAL ANTHROPOLOGY OF FOOD AND HEALTH (3)**  
Offered Spring. Instructor(s): Landecker.
- ANTH 588 LIFE CYCLE: A BIOCULTURAL VIEW (3)**  
Graduate/Undergraduate version: ANTH 388. Not offered this academic year. Instructor(s): Georges.
- ANTH 590 CULTURE, NARRATION, AND SUBJECTIVITY (3)**  
Graduate/Undergraduate version: ANTH 390. Not offered this academic year.
- ANTH 595 CULTURES AND COMMUNICATION (3)**  
Graduate/Undergraduate version: ANTH 395. Not offered this academic year.
- ANTH 600 INDEPENDENT STUDY (1 TO 9)**  
Repeatable for Credit. Offered Fall.
- ANTH 601 GRADUATE PROSEMINAR IN ANTHROPOLOGY (3)**  
Mapping the current fields of anthropological discourses, examining the debates in and between each of these fields, and discussing how these debates are conducted in the domains of fieldwork, ethnographic writing, and in the construction of careers in anthropology. Offered Fall. Instructor(s): Faubion.
- ANTH 602 ANTHROPOLOGY PROPOSAL WRITING SEMINAR (3)**  
This seminar prepares anthropology graduate students to write a successful grant proposal. Basic elements of proposal writing, including problem conceptualization, literature reviews and methods will be covered. Offered Fall. Instructor(s): Georges.
- ANTH 603 ANALYZING PRACTICE (3)**  
Graduate/Undergraduate version: ANTH 403. Not offered this academic year. Instructor(s): Faubion.
- ANTH 605 FIELDWORK (4)**  
Fieldwork-- In which students pursue ethnographic research, learn to manage information and create presentations using a variety of tools and technologies. Topics and themes change. Repeatable for Credit. Offered Fall. URL: [kelty.rice.edu/605/](http://kelty.rice.edu/605/). Instructor(s): Kelty.
- ANTH 606 COGNITIVE STUDIES (3)**  
Graduate/Undergraduate version: ANTH 406. Repeatable for Credit. Offered Spring. Instructor(s): Tyler.
- ANTH 609 AUTHORSHIP AND OWNERSHIP (3)**  
Graduate/Undergraduate version: ANTH 409. Not offered this academic year.
- ANTH 610 THE ETHNOGRAPHY OF DEVELOPMENT (3)**  
Graduate/Undergraduate version: ANTH 410. Not offered this academic year.
- ANTH 612 RHETORIC (3)**  
Graduate/Undergraduate version: ANTH 412. Repeatable for Credit. Offered Spring. Instructor(s): Tyler.
- ANTH 613 POSTSOCIALISM (3)**  
Graduate/Undergraduate version: ANTH 413. Limited enrollment. Not offered this academic year. Instructor(s): Ninetto.
- ANTH 614 HERMENEUTICS AND LINGUISTIC ANTHROPOLOGY (3)**  
Graduate/Undergraduate version: ANTH 414. Repeatable for Credit. Offered Fall. Instructor(s): Tyler.
- ANTH 615 THEORIES OF MODERNITY/POSTMODERNITY (3)**  
Graduate/Undergraduate version: ANTH 415. Not offered this academic year. Instructor(s): Faubion.

**ANTH 618 CAN HUMANS THINK? ANTHROPOS, HUMANISM AND TECHNOLOGY (3)**

Graduate/Undergraduate version: ANTH 418. Not offered this academic year. Instructor(s): Kelty.

**ANTH 619 LAW AND SOCIETY (3)**

Graduate/Undergraduate version: ANTH 419. Not offered this academic year.

**ANTH 625 ADVANCED TOPICS IN ARCHAEOLOGY (3)**

Graduate/Undergraduate version: ANTH 425. Repeatable for Credit. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 630 EXPERIMENTAL WRITING (3)**

Graduate/Undergraduate version: ANTH 430. Repeatable for Credit. Offered Spring. Instructor(s): Landecker.

**ANTH 640 ANTHROPOLOGY OF THE LIFE SCIENCES (3)**

Graduate/Undergraduate version: ANTH 440. Repeatable for Credit. Offered Fall. Instructor(s): Landecker.

**ANTH 646 ADVANCED TOPICS IN BIOMEDICAL ANTHROPOLOGY (3)**

Graduate/Undergraduate version: ANTH 446. Offered Spring. Instructor(s): Georges.

**ANTH 647 MODERN ETHNOGRAPHY AND THE ETHNOGRAPHY OF MODERNITY (3)**

Graduate/Undergraduate version: ANTH 447. Not offered this academic year. Instructor(s): Faubion.

**ANTH 650 PEDAGOGY (3)**

Training in the basic elements of teaching in anthropology to be taken in conjunction with applied graduate student teaching in ANTH 316. Recommended prerequisite(s): Third year and above graduate students. Repeatable for Credit. Offered Spring. Instructor(s): Georges.

**ANTH 655 INTRODUCTION TO SCIENCE AND TECHNOLOGY STUDIES (3)**Graduate/Undergraduate version: ANTH 455. Not offered this academic year. URL: [kelty.rice.edu/455/index.html](http://kelty.rice.edu/455/index.html). Instructor(s): Kelty.**ANTH 658 HUMAN OSTEOLOGY (3)**

Graduate/Undergraduate version: ANTH 458. Offered Fall. Instructor(s): S. McIntosh.

**ANTH 660 ADVANCED ARCHAEOLOGICAL THEORY (3)**

Graduate/Undergraduate version: ANTH 460. Pre-requisite(s): ANTH 205. Repeatable for Credit. Offered Spring. Instructor(s): S. McIntosh.

**ANTH 663 WEST AFRICAN PREHISTORY (3)**

Graduate/Undergraduate version: ANTH 463. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 668 PALAEOCLIMATE AND HUMAN RESPONSE (3)**

Graduate/Undergraduate version: ANTH 468. Repeatable for Credit. Not offered this academic year. Instructor(s): S. McIntosh; Droxler.

**ANTH 674 ADVANCED SEMINAR ON THE PREHISTORIC LANDSCAPE (3)**

Graduate/Undergraduate version: ANTH 474. Not offered this academic year. Instructor(s): S. McIntosh.

**ANTH 675 PLIO-PLEISTOCENE CLIMATE CHANGE AND HOMINID ADAPTATION (3)**

Graduate/Undergraduate version: ANTH 475. Offered Spring. Instructor(s): S. McIntosh; Droxler.

**ANTH 683 DOCUMENTARY AND ETHNOGRAPHIC (3)**

Cross-listed with HART 683. Graduate/Undergraduate version: ANTH 483. Not offered this academic year.

**ANTH 800 RESEARCH AND THESIS (3 TO 9)**

Repeatable for Credit. Offered Fall &amp; Spring. Instructor(s): Faubion.

**ARAB (ARABIC)****School of Humanities/Center for Study of Languages****ARAB 101 INTRODUCTION TO MODERN ARABIC LANGUAGE AND CULTURE I (5)**This course introduces students to Modern Standard Arabic within the cultural context of the Arab world. Students will learn speaking, listening, reading and writing skills through communicative drills and conversation practice. Multimedia material is an integral part of the course. Students will reach the Novice High level. Recommended prerequisite(s): No prior knowledge of Arabic. Limited enrollment. Offered Fall. URL: [langcenter.rice.edu/courses.cfm](http://langcenter.rice.edu/courses.cfm).



**ARAB 102 INTRODUCTION TO MODERN ARABIC LANGUAGE AND CULTURE II (5)**

Using an interactive approach, students will expand on the four language skills, acquiring additional basic structures and vocabulary. The content will focus on their immediate environment and multiple aspects of the Arab world. Multimedia material is an integral part of the course. Students will reach the Intermediate Low level. Pre-requisite(s): ARAB 101, or placement test or permission of instructor. Limited enrollment. Offered Spring. URL: langcenter.rice.edu/courses.cfm.

**ARAB 201 INTERMEDIATE MODERN ARABIC LANGUAGE AND CULTURE I (4)**

In this course, students will further their proficiency in reading, writing, speaking and listening, utilizing complex semantic and syntactic structures. Students will be encouraged to participate in discussions, discourse and analysis, featuring historical, geographic, and cultural topics specific to the Arab world. Multimedia material is an integral part of the course. Students will reach the Intermediate Mid level. Prerequisite(s): ARAB 102, or placement test or permission of instructor. Limited enrollment. Offered Fall. URL: langcenter.rice.edu/courses.cfm.

**ARAB 202 INTERMEDIATE MODERN ARABIC LANGUAGE AND CULTURE II (4)**

In this fourth course of the Arabic sequence, assignments and activities center on historical, geographic, social, and literary topics as well as current issues in the Arab world. Students will acquire additional forms, structures and expressions that help them communicate their thoughts through discourse at the Intermediate High level. Pre-requisite(s): ARAB 201, or placement test or permission of instructor. Limited enrollment. Offered Spring. URL: langcenter.rice.edu/courses.cfm.

**ARAB 301 SEMINAR IN ARABIC (3)**

Advanced readings and discussions focus on various literary and cultural topics ranging from the classical to contemporary. The course integrates advanced grammatical constructions with comprehension and communication skills. Pre-requisite(s): ARAB 202, or placement test or permission of instructor. Limited enrollment. Offered Fall.

**ARAB 302 SEMINAR IN ARABIC (3)**

Advanced readings and discussions focus on various literary and cultural topics ranging from the classical to contemporary. The course integrates advanced grammatical constructions with comprehension and communication skills. Pre-requisite(s): ARAB 301, or placement test or permission of instructor. Limited enrollment. Offered Spring.

**ARAB 398 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Repeatable for Credit. Limited enrollment. Offered Fall.

**ARAB 399 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Repeatable for Credit. Limited enrollment. Offered Spring.

**ARCH (ARCHITECTURE)****School of Architecture/Architettura****ARCH 101 PRINCIPLES OF ARCHITECTURE I (4)**

Visual studies using simple tools and materials to develop an awareness of the environment and a vocabulary to describe it. Requisite for architecture majors. Offered Fall. Instructor(s): Greander; Samuels.

**ARCH 102 PRINCIPLES OF ARCHITECTURE I (4)**

A development of communication of formal information from further investigation of visual structures and their order. Requisite for architecture majors. Cross-listed with ARTS 102. Pre-requisite(s): ARCH 101. Offered Spring. Instructor(s): Grenader; Samuels.

**ARCH 115 WOODSHOP SAFETY (1)**

The course will cover all safety concerns in the model shop. Students will learn the proper set up and maintenance of the stationary tools as well as how to do basic fabrication. Students will learn basic material layout and produce objects using the tools as we cover them. Offered Fall. Instructor(s): Loucks.

**ARCH 132 FRESHMAN SEMINAR ON ARCHITECTURAL ISSUES (2)**

Introductory tutorial. Readings, field trips, and seminar discussions. Exploration of the role of the architect and architecture in the metropolis. Offered Spring. Instructor(s): Casbarian.

**ARCH 201 PRINCIPLES OF ARCHITECTURE II (6)**

Introduction to concepts of beginning architectural design. Design process as problem solving with emphasis on conscious method. Requisite for architecture majors. Pre-requisite(s): ARCH 102. Offered Fall. Instructor(s): Oliver; Ray.

**ARCH 202 PRINCIPLES OF ARCHITECTURE II (6)**

Introduction to concepts of beginning architectural design. Design process as problem solving with emphasis on conscious method. Requisite for architecture majors. Pre-requisite(s): ARCH 201. Offered Spring. Instructor(s): Wittenberg; Morrow.

**ARCH 207 INTRODUCTION TO DESIGN OF STRUCTURES (3)**

The course will introduce students to historical and contemporary structures through multi-media presentations, computer-based visualizations, field trips and hands-on experiments with materials of construction and physical models of structures. This is an introductory interactive course on the art and science of designing engineered structures and is intended for freshmen and sophomores interested in both civil engineering and architecture. Graduate/Undergraduate version: ARCH 507. Offered Fall. Instructor(s): Wittenberg.

**ARCH 214 DESIGN OF STRUCTURES II (3)**

Application of materials & construction (wood, masonry, concrete & steel). Case studies & field trips. Graduate/Undergraduate version: ARCH 514. Offered Spring. Instructor(s): Oberholzer.

**ARCH 220 ISTANBUL: LIFE OF AN IMPERIAL CITY (3)**

An introduction to the Ottoman capital and its monuments (15th century - 19th century). Major themes include the Byzantine legacy; imperial patronage; expressions of dynastic legitimacy, power and religion; ceremonial and imperial canon; the European influence; city's representations; leisure and public life. Limited enrollment. Offered Fall. Instructor(s): Hamadeh.

**ARCH 301 PRINCIPLES OF ARCHITECTURE III (6)**

Intermediate level design problems with emphasis on building technology, programming and formal design. Requisite for paraprofessional major in architecture. Pre-requisite(s): ARCH 202. Offered Fall. Instructor(s): Hight; Lally.

**ARCH 302 PRINCIPLES OF ARCHITECTURE III (6)**

Variety of intermediate level problems for developing comprehensive experience in design methods and processes. Requisite for paraprofessional major in architecture. Pre-requisite(s): ARCH 301. Offered Spring. Instructor(s): Cannady; Finley; Parsons.

**ARCH 303 SEMINAR IN SUSTAINABLE ENVIRONMENT ANALYSIS (1)**

Engineering students will work with architecture students in analyzing basic design principles of sustainable design. Students analyses will be incorporated in the final design projects and culminate in a semester final report. Limited enrollment. Offered Fall. Instructor(s): Cannady.

**ARCH 311 HOUSTON ARCHITECTURE (3)**

This course consists of a series of illustrated lectures and walking tours that describe and analyze the architecture of Houston from the city's founding in 1836 to the present. Characteristic building types and exceptional works of architecture are identified; tours stimulate an awareness of the historical dimension of urban sites. Graduate/Undergraduate version: ARCH 611. Offered Fall. Instructor(s): Fox.

**ARCH 313 CASE STUDIES IN SUSTAINABLE DESIGN (3)**

This course will explore sustainable design from initial sustainable facility concepts and team organizations, to enlisting community support and process assessment. The course will develop into details about sustainable design, lessons learned, processes and outcomes. Cross-listed with ENST 313. Graduate/Undergraduate version: ARCH 613. Limited enrollment. Offered Fall & Spring. Instructor(s): Taylor.

**ARCH 315 DESIGN OF STRUCTURES III (3)**

Application of principles of analysis to construction of steel & concrete framed structures. Continuation of ARCH 213, 214. Graduate/Undergraduate version: ARCH 515. Offered Spring. Instructor(s): Wittenberg.

**ARCH 316 ENVIRONMENTAL CONTROL SYSTEMS (3)**

An introduction to the thermal performance of buildings. Course is divided into 2 parts: Building Climatology and Air Conditioning Systems. Graduate/Undergraduate version: ARCH 516. Offered Fall. Instructor(s): Wittenberg.

**ARCH 317 LANDSCAPE AND SITE STRATEGIES FOR HOUSTON (3)**

This course is a workshop in site planning, with Houston as its focus. It will allow students to gain practice assessing, cataloging, and communicating the many complex issues that go into plugging a building into a site. We will navigate the networks created by natural environments, the build and legal environments, and access. The final product of this course is a site plan. Graduate/Undergraduate version: ARCH 617. Limited enrollment. Offered Spring. Instructor(s): Albert; Whitehead.

**ARCH 319 DOING THE JITTERBUG (3)**

The goal of this course is to probe this spectrum for opportunities to develop an invigorated notion of form and structure, one that has the capacity to adjust and adapt, negotiating between fully-infused networked organizations and atrophying into the regularity or planar surfaces. The work will be focused on a basic design problem: how to produce controlled transformations of a given geometrical module and how to create continuity between organizational states. In contradistinction to either the geodesic logic, where repetition is privileged, or the logics of formal techniques of singular objects-the course will focus on developing an approach to architectural substance, which has the capacity to operate on several scales and attain the several phase transitions within a coherent organization. Offered Fall. Instructor(s): Lee.

**ARCH 322 METHODS OF MAKING (3)**

The intent of this class is to saturate the design process with direct experience, to make fabrication synonymous with design. The focus is on identifying and developing an awareness of the underlying principles manifest in joining materials. Graduate/Undergraduate version: ARCH 622. Offered Spring. Instructor(s): Guthrie.

**ARCH 325 WHAT IS ISLAMIC ART? (3)**

This seminar is a critical examination of key themes and issues in Islamic art. Based on readings that focus on specific examples of artistic and architectural production of major landmarks from the 7th to the 18th centuries our discussions will evolve around such questions as: What is Islamic about Islamic art? How and where did art, religion, and politics intersect? To what extent were art and architecture informed by religious principles, practices, and rituals? Can we speak of a distinctive visual language across the Muslim world? We will also explore the role of myth in the construction of cultural heritage, the development of writing into the art form of calligraphy, and questions of patronage and imperial ideology. We will revisit long-held assumptions about the nature of Islamic art as iconoclastic and aniconic, and about the nature and scope of artistic exchange between the Muslim world and the Latin Christian West, Byzantium, and China. Cross-listed with HART 325. Limited enrollment. Not offered this academic year. Instructor(s): Hamadeh.

**ARCH 327 BUILDING WORKSHOP I (3)**

The Rice Building Workshop involves students in the design and construction of real projects at various scales. Elective courses and course sequences will be formatted to address the specific requirements of each project as required. Please consult postings for further information. Graduate/Undergraduate version: ARCH 627. Repeatable for Credit. Offered Fall. Instructor(s): Samuels; Grenader.

**ARCH 331 VISUAL CULTURE OF THE ISLAMIC WORLD I (3)**

An introduction to the arts and architecture of the Islamic world from the rise of Islam to the Mongol invasions. Explores the development of a visual tradition through its continuities, regional variations, exchanges, and intertextualities. Examines key religious and secular institutions and art forms through their aesthetic and historical contexts. Cross-listed with HART 321. Offered Fall. Instructor(s): Fetvaci.

**ARCH 332 VISUAL CULTURE OF THE ISLAMIC WORLD II (3)**

An introduction to the architecture, ceramics, textiles, and arts of the book of the Islamic world, from Egypt to India and Central Asia, beginning in the wake of the Mongol conquests and ending with the demise of the Ottoman empire. Focusing on court patronage and production, the course examines key buildings and objects through their aesthetic, cultural, religious, and political contexts. Methodological concerns of the field are addressed through an exploration of such themes as iconoclasm, word and image, and cross-cultural influences. Cross-listed with HART 322. Offered Spring. Instructor(s): Fetvaci.

**ARCH 334 BUILDING WORKSHOP II (3)**

Real-life problems dealing with design and construction. Graduate/Undergraduate version: ARCH 634. Repeatable for Credit. Offered Spring. Instructor(s): Samuels.

**ARCH 344 CONSTRUCTION AND DESIGN (3)**

A seminar in which the relationship between the construction of an object and its usefulness is explored. The premise in the course is that the way things are made can be one credible point of departure for the architectural design process. Graduate/Undergraduate version: ARCH 644. Offered Spring. Instructor(s): Parsons; Satterfield.

**ARCH 345 ARCHITECTURE AND THE CITY I (3)**

This course will trace the development of Renaissance and Baroque architecture in Italy and France with reference to the dialectic of license and rule. The first part, which covers the period from 1400-1600, will focus on the civil, domestic and ecclesiastical architecture of the chief protagonists of the Italian Renaissance: Brunelleschi, Alberti, Bramante, Giulio Romano, Michelangelo and Palladio. Their buildings and urban initiatives will be interpreted in terms of continuities & discontinuities between an emerging theoretical tradition and the demands of actual practice. Cross-listed with HART 345. Graduate/Undergraduate version: ARCH 645. Offered Fall. Instructor: Hight.

**ARCH 346 ARCHITECTURE AND THE CITY II (3)**

This course is an overview of modern architecture with reference to related issues in cultural modernity. The course will consider important work of the 19th and 20th century, although reference will be made to earlier material where it bears on the issues under discussion. The course begins with the claim that the architecture of modernity has historically been conceived and developed in relation to utopian ideals, and that architectural modernism cannot be adequately understood unless attention is paid to its various utopian and dystopian 'moments'. Graduate/Undergraduate version: ARCH 646. Pre-requisite(s): ARCH 345 or ARCH 645. Offered Spring. Instructor(s): el-Dahdah.

**ARCH 348 TESTING, TESTING, 1, 2, 3 (3)**

Based on the tension implicit in this perceptual/material shift, this seminar seeks to straddle this divide through the strategic deployment of digital fabrication techniques in the design and construction of form active structural surfaces. The objective of the seminar is to engage digital fabrication in two ways. First, to explore a conceptual framework and a technical model of modulating continuous structural surfaces that does not rely on self-similar modularity. Second, to investigate material assemblies that not only enable new forms and material effects, but also sublimate the hierarchical separation of skin and frame. Offered Spring. Instructor(s): Lee.

**ARCH 353 PHOTOGRAPHY FOR ARCHITECTS (3)**

Exploration of a variety of photographic techniques for architectural research, design, and presentation. Graduate/Undergraduate version: ARCH 653. Offered Fall. Instructor(s): White.

**ARCH 357 ART AND EMPIRE: THE OTTOMAN WORLD (3)**

This course looks at the art and architecture of the Ottoman empire, the longest surviving Muslim empire, from its inception in 1453 until its demise in the 1920s. Based on in-depth studies of religious and secular monuments, objects, and paintings, it examines the roots of Ottoman visual culture, the formation of a canonic style, relations with eastern and western artistic traditions, issues of power and identity in art, systems of patronage, concepts of westernization and Ottoman modernism. Limited enrollment. Not offered this academic year. Instructor(s): Hamadeh.

**ARCH 358 CAST MODERNITY (3)**

This seminar will look at concrete's role as a facilitator of the conceptual and theoretical agendas of the architecture of the 20th century. Just as the Domino system enabled a new architecture at the beginning of the century, the current interests in topological and non-treated form are again arguing for concrete's unique properties. Graduate/Undergraduate version: ARCH 658. Offered Spring. Instructor(s): Oliver.

**ARCH 363 ARCHITECTURAL REPRESENTATION (3)**

A semester long workshop designed to impart skills in free-hand drawing, with an emphasis on architectural subjects. The course will consist of in-class sketching exercises and out-of-class drawing assignments. Repeatable for Credit. Offered Fall. Instructor(s): Cannady.

**ARCH 368 SEMINAR: TECHNOLOGY AND SOCIETY (3)**

This research-based seminar is a quod libet course open to graduate and undergraduates alike. The course will place heavy emphasis on weekly writing and reading and formal research techniques. Students will select their own research topics and will develop written and graphic materials for seminar presentations and publication. Finished materials will be prepared for, and presented at, every class meeting. It is encouraged that this course be used in conjunction with a design studio, as a research, theory, and development arm. Graduate/Undergraduate version: ARCH 668. Offered Spring. Instructor(s): Kwinter.

**ARCH 374 THE JOY OF MATERIALS (3)**

An investigation of how materials influence and inspire the making of works of architecture. Graduate/Undergraduate version: ARCH 674. Limited enrollment. Offered Spring. Instructor(s): Jimenez.

**ARCH 382 REPOSITIONING THE SEAM (TECHNOLOGY SEMINAR) (3)**

The class will explore the use of surface modeling software and CAD modeling tools how various techniques of articulating form, in relation to programmatic performance, affects the visual, formal, and spatial organization of the places we inhabit. With the use of surface modeling programs and CAD drafting tools, a heavy emphasis will be placed on articulating the work through graphic techniques before being applied to physical models. The class will be run in small groups of 2-3 people. The initial weeks of the class will be spent looking to precedents, which explore various techniques of articulating form and space. Each team will then focus these various techniques from the precedents on a single space or series of spaces. With each group focusing on the same space, each with a separate emphasis, a juxtaposition of results will occur allowing for a comparison that looks to implications on the visual, performative, and organizational systems. Offered Spring. Instructor(s): Lally.

**ARCH 384 CONCEPTUAL ART AND ARCHITECTURE (3)**

The first part of the course will examine the conceptual art practices that began in the 1960s, including Bochner, Kosuth, art and language, LeWitt, Haacke, Kelly, and Smithson. The second part of the course will focus on the question of what constitutes a conceptual architecture by interrogating a series of potential practices including: Super Studio, Anichigram, Eisenman, Libeskind, Shinohara, Hejduf, Tschumi, and others. Cross-listed with HART 392. Graduate/Undergraduate version: ARCH 684. Offered Spring. Instructor(s): Last.

**ARCH 386 ARCHITECTURE AND SOCIETY II (ENLIGHTENMENT-POSTMODERNITY) (3)**

Through a series of case studies, this course will examine the socio-cultural consequences of exemplary buildings from the Enlightenment through Postmodernity. Graduate/Undergraduate version: ARCH 686. Offered Spring.

**ARCH 401 PRINCIPLES OF ARCHITECTURE IV (6)**

Upper level architectural design problems with an emphasis on urban issues and site planning, and complex building organization. Required for preprofessional major in architecture. Pre-requisite(s): ARCH 302. Offered Fall. Instructor(s): Jimenez; Morrow.

**ARCH 402 PRINCIPLES OF ARCHITECTURE IV (6)**

Pre-requisite(s): ARCH 401. Offered Spring. Instructor(s): Cannady; Finley; Parsons.

**ARCH 416 DESIGN AND CONSTRUCTION PROJECT DELIVERY INNOVATION (3)**

Process innovation in the design and construction industries is far too rare. Even with access to powerful tools such as CADD and the Internet, many opportunities for process improvement are overlooked and problems are repeatedly ignored. Within this course, cross-discipline project teams will use contemporary business tools to evaluate longstanding industry practices and develop ideas for process innovation. At the end of the semester, students will present innovation concepts to members of the Project Delivery Innovation Forum, a group of industry leaders that may select student ideas for further research on real projects. Graduate/Undergraduate version: ARCH 616. Offered Spring. Instructor(s): White-Bryson.

**ARCH 418 SEMINAR IN ADVANCED MATERIALS AND SYSTEMS (3)**

The purpose of this course is to explore the architectural potential of advanced materials and systems through a combination of research and fabrication. Students will be responsible for choosing a material or system, developing a history of the material/system's development and use, making a class presentation, and developing a web description of the material/system to be included in a class web page. Simultaneously, students will be required to contact both manufacturers and local fabricators in order to put together a small demonstration project, illustrating the material/system's potential. Offered Spring. Instructor(s): Wittenberg.

**ARCH 423 PROFESSIONALISM AND MANAGEMENT IN ARCHITECTURAL PRACTICE (3)**

An introductory survey of the characteristics of the delivery of architectural services by professional design organizations. Through readings and lectures, students become familiar with the social, technical, legal, ethical, and financial milieu of modern architecture practice. Graduate/Undergraduate version: ARCH 623. Offered Spring. Instructor(s): Fleishacker; Furr.

**ARCH 432 INTRODUCTION TO COMPUTER APPLICATIONS IN ARCHITECTURE (3)**

This course is designed as a general introduction to computing in the context of architectural design. Emphasis is on the use of digital media as design tools and the appropriate use of these tools in the varying processes of design. This course includes exposure to a broad spectrum of design, drafting, modeling and presentation software.

**ARCH 435 ARCHITECTURAL COMPUTER GRAPHICS OVERVIEW (3)**

Introduction to basic computer graphics, computer aided design, and the programming algorithms that underlie them. Develops familiarity with packages such as Autocad and Arris. Graduate/Undergraduate version: ARCH 635. Must be enrolled in one of the following Major(s): Architecture. Offered Fall & Spring. Instructor(s): L. Koehler; P. Koehler.

**ARCH 436 COMPUTER AIDED DESIGN IN ARCHITECTURE (3)**

Advanced computer graphic techniques using CAD in architecture as a design and presentation medium. Graduate/Undergraduate version: ARCH 636.

**ARCH 439 THREE DIMENSIONAL COMPUTER GRAPHICS (3)**

A workshop in three-dimensional computer modeling and its theoretical implications for architecture and design. One class session each week will be a how to lecture covering the technical side of modeling. The other sessions will consist of group discussion through which we will explore the theoretical implications of the medium and test the limits of its use as architectural representation. Graduate/Undergraduate version: ARCH 639. Offered Fall. Instructor(s): Robinson.

**ARCH 441 THE STRUCTURE OF SPACE: TECHNOLOGY SEMINAR (3)**

The class will explore the potentials of software visualization and form fabrication in a focused semester long design exercise. The class will focus on the techniques and operations available to us in how we define and construct spacial territories before fabricating physical models of these investigations. (Basic understanding of Maya encouraged but no previous requisites required). Graduate/Undergraduate version: ARCH 641. Offered Fall. Instructor(s): Lally.

**ARCH 454 20TH CENTURY NORTH AMERICAN ARCHITECTURE (3)**

A seminar in history and criticism. In this course, we will consider the establishment of a canon of 20th century architecture in North America (US & Canada). Each week we will take apart the various criteria that qualify buildings for history including aesthetic and stylistic quality, technological invention, architectural careerism, urban contributions, stylistic quality, technological invention, architectural careerism, urban contributions, geographic influence, typology, theory, art movements, and social implications. The goal of the course is to investigate the way texts relate to build reality. Graduate/Undergraduate version: ARCH 654. Offered Fall & Spring.

**ARCH 455 HOUSING AND URBAN PROGRAMS: ISSUES IN POLICY (3)**

This course will explore current issues in the formulation and implementation of housing and urban development programs in the U.S. An oral presentation and written paper on a specific topic within a general policy area required. Graduate/Undergraduate version: ARCH 655. Offered Fall & Spring. Instructor(s): Lord.

**ARCH 457 AFFORDABLE HOUSING: A PRACTICUM IN DEVELOPMENT (3)**

To give the students a practical experience in developing an affordable housing project from conception through design, financing, and construction. Lecturing given by instructor on Federal, State, and local legislation and regulation as well as private source of financing, and guiding students in real life situations with architects, contractors, and clients. Field trips to affordable housing sites and guest lectures by qualified experts. Instructor(s): Lord.

**ARCH 459 MODERN BRAZIL (3)**

This seminar will be conducted as a research workshop with the aim of developing publication projects on three principal architects in Brazil's architectural modernity: the urbanist, Lucio Costa, the architect, Oscar Niemeyer, and the landscape architect, Roberto Burle Marx. The first half of the semester will consist of surveying modern architecture in Brazil, which will be followed by a closer look at the work of Costa, Niemeyer, and Burle Marx. In the second half of the semester, we will look into a particular forms of architectural publication, the 'Complete Works' in order to develop a format appropriate to the production of the three figures in question. This will lead to specific research projects that will deal with the archival care of architectural records, 3D modeling of unbuilt projects, and theoretical strategies for interpretive approaches to work. Limited enrollment. Offered Fall. Instructor(s): el-Dahdah.

**ARCH 461 SPECIAL PROJECTS (3 TO 9)**

Independent research or design arranged in consultation with a faculty member. Subject to approval of faculty advisor and director. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor: Casbarian/ Advisor.

**ARCH 469 CASE STUDY IN URBAN DESIGN: BRASILIA (3)**

Starting with two principal documents describing the city of Brasilia, the original hand drawn competition entry in 1957 and a digital survey of 1997, this seminar will study modern urban design in relation to the 1950's project for a new Brazilian capital. The project of Brasilia, and its inevitable transformation over time, will be looked at historically, politically, culturally, formally and esthetically. Graduate/Undergraduate version: ARCH 669. Limited enrollment. Offered Fall. Instructor(s): el-Dahdah.

**ARCH 481 THE IDEA OF HOUSING (3)**

In the 1920s, the architectural idea of housing and the philosophical idea of existentialism emerged simultaneously in presumably unrelated intellectual circles. Being and Time was published in 1927, the same year the Weissenhof Settlement opened to the public in Stuttgart. One need only emphasize the fact that Martin Heidegger is precisely the same age as both Le Corbusier and Mies to suggest an exploration of the possible connections between the two seemingly disparate intellectual trends. Whether this shared history represents only a coincidence or the overlap of significant content is an open question. The first part of the seminar will examine this question. The second part will catalogue the institutionalization of these ideas through the 1950s using a series of case studies. Graduate/Undergraduate version: ARCH 681.

**ARCH 483 TWENTIETH CENTURY HISTORY OF IDEAS OF ARCHITECTURE (3)**

This course will examine Twentieth Century architectural discourse in a broad intellectual context. Course material will cover the period between 1900 and the present, focusing on 1965-1995. Special attention will be paid to relationships among philosophy, critical theory, cultural criticism, and the objects and theories of architecture. The following topics are covered: Anticipation and Reflection, Formalist Aesthetics, Architecture and Form, Culture and Modernity, Culture and Depth Analysis, Psychoanalytic Interpretation, Architecture and Desire, Culture and Politics, Marxism and Neo-Historicism, Architecture and Political Critique, Phenomenology and Reception, Architecture and the Life-World, Culture after Modernism, Semiotics and Structuralism, Discourse and Discipline, Deconstruction and Textuality, Deconstruction (Re)constructed, Feminism and Gender Theory, Architecture and Difference. Graduate/Undergraduate version: ARCH 683. Offered Fall. Instructor(s): Last.

**ARCH 485 ARCHITECTURE AND SOCIETY I (3)**

Through a series of case studies, this course will examine the socio-cultural consequences of exemplary buildings from Antiquity through the 17th century. Cross-listed with HART 455. Graduate/Undergraduate version: ARCH 685. Offered Fall & Spring. Instructor(s): Hight.

**ARCH 492 PROBLEMS IN KNOWLEDGE AND DESIGN (3)**

This course will present as series of lectures on the physics and metaphysics of creation and genesis from a wide variety of perspectives and disciplines, slowly sewing them together within a general and nonclassical approach to form. Graduate/Undergraduate version: ARCH 692. Offered Spring. Instructor(s): Kwinter.

**ARCH 495 BODIES OF KNOWLEDGE IN CONTEMPORARY AND LATE 20TH CENTURY ARCHITECTURE (3)**

Both experimental and normative architectural discourse/design operates through a complex relationship to something referred to as "the body", informing the discipline's relationship to other fields of knowledge, technologies of subjectivity, and problems of epistemology and ontology. The course examines this relationship by developing a transdisciplinary history of the body in architecture for modernity, in the process exploring what that last phrase would mean. Offered Fall. Instructor(s): Hight.

**ARCH 500 PRECEPTORSHIP PROGRAM (15)**

Full time internship for nine to twelve months under guidance of appointed preceptor. Required for all recipients of Rice B.A. degrees in pre-professional program of area majors who seek admission to graduate studies in Architecture. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Casbarian.

**ARCH 501 CORE DESIGN STUDIO I (10)**

Requisite for admission to graduate professional program options in architecture or urban design for students with nonarchitectural bachelor's degree. Lectures, seminars, laboratories, and design studio projects adjusted to individual needs. Offered Fall. Instructor(s): Satterfield.

**ARCH 502 CORE DESIGN STUDIO II (10)**

This studio emphasizes the impact of building systems and protocols on the spatial and formal organization of architecture with a final project focused on the design of a public building in a metropolitan context. The studio focuses equally on the development of conceptual rigor and technical expertise. Offered Spring. Instructor(s): Oliver; Felder.

**ARCH 503 CORE DESIGN STUDIO III (10)**

Design studio to follow ARCH 501, 502. Preparation for entering studios in the regular graduate programs in architecture and urban design in the following semester. Offered Fall. Instructor(s): Wittenberg, Finley.

**ARCH 504 CORE DESIGN STUDIO IV (10)**

Exploration of abstract thought and design capabilities relevant to systematic processes of designing specific buildings and facilities. Course content is topic oriented and varies section to section. Offered Spring. Instructor(s): Hight; Robinson.

**ARCH 507 INTRODUCTION TO DESIGN OF STRUCTURES (3)**

Graduate/Undergraduate version: ARCH 207. Instructor(s): Wittenberg.

**ARCH 514 DESIGN OF STRUCTURES II (3)**

A course in structures for students in the Option I Program. Topics include: structure in architecture; forces and equilibrium; structural materials; the behavior, analysis, and design of structural elements and their connections. Graduate/Undergraduate version: ARCH 214. Offered Spring. Instructor(s): Wittenberg.

**ARCH 515 DESIGN OF STRUCTURES III (3)**

A second course in structures for students in the Qualifying Graduate Program. Topics include: additional topics in the behavior, analysis, and design of structural elements; synthesis of structural elements into structural systems; integration of structural systems with other building systems. Graduate/Undergraduate version: ARCH 315. Offered Spring. Instructor(s): Wittenberg.

**ARCH 516 ENVIRONMENTAL CONTROL SYSTEMS (3)**

Graduate/Undergraduate version: ARCH 316. Offered Fall. Instructor(s): Wittenberg.

**ARCH 532 INTRODUCTION TO DIGITAL, VISUALIZATION, AND COMMUNICATION (3)**

Provides an introduction to digital visualization & communication in the context of architectural design. Emphasis is placed on working methods that engage specific issues of the complex assemblies in architectural practice, coordinating various software & graphic techniques through composite methods. The last 3 weeks of the semester will focus on the design & production of a printed portfolio to organize & communicate design work from the first 2 semesters of the core studio sequence. Applications include: Illustrator, In-Design, Photoshop, AutoCAD, 3D MAX, FormZ, DreamWeaver, and Flash. Offered Spring. Instructor(s): Finley; Satterfield.

**ARCH 600 M. ARCH. I INTERNSHIP (1 TO 15)**

Practical work experience for students who have completed at least four semesters in the Option I Program prior to their entrance into the regular Master of Architecture studio sequence. Instructor permission required. Repeatable for Credit. Limited enrollment.

**ARCH 601 ARCHITECTURAL PROBLEMS: STUDIO (10)**

Emphasis on abstract thought and design capabilities relevant to systematic processes of designing specific buildings and facilities. Note: there are three separate sections for this course. Repeatable for Credit. Offered Fall. Instructor(s): Cannady+2 additional sections; Wamble.

**ARCH 602 ARCHITECTURAL PROBLEMS (10)**

Emphasis on abstract thought and design capabilities relevant to systematic processes of designing specific buildings and facilities. Repeatable for Credit. Offered Spring. Instructor(s): Jimenez; Lally; Last; Lee.

**ARCH 603 ARCHITECTURAL PROBLEMS: STUDIO (10)**

Emphasis on abstract thought and design capabilities relevant to systematic processes of designing specific buildings and facilities. Offered Fall & Spring.

**ARCH 605 ARCHITECTURAL PROBLEMS: STUDIO (10)**

Studio conducted in a workshop format with exercises in such topical areas as program development, energy analysis and design, building system integration, and financial analysis. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Visiting critics.

**ARCH 610 BUILDING WORKSHOP: THEATER RENOVATION/PARIS PROGRAM (6)**

Special seminars, lectures, and site visits relevant to history, urban theory, and structure of Paris and other European centers. Offered Fall & Spring. Instructor(s): Fitzsimons; Visiting critics.

**ARCH 611 HOUSTON ARCHITECTURE (3)**

Graduate/Undergraduate version: ARCH 311. Offered Fall. Instructor(s): Fox.

**ARCH 613 CASE STUDIES IN SUSTAINABLE DESIGN (3)**

Graduate/Undergraduate version: ARCH 313. Offered Fall & Spring. Instructor(s): Taylor.

**ARCH 615 WOODSHOP SAFETY (1)**

This course will cover all safety concerns in the model shop. Students will learn the proper set up and maintenance of the stationary tools as well as how to do basic fabrication. Students will learn basic material layout and produce objects using the tools as we cover them. Offered Fall. Instructor(s): Loucks.

**ARCH 616 DESIGN AND CONSTRUCTION PROJECT DELIVERY INNOVATION (3)**

Cross-listed with MGMT 716. Graduate/Undergraduate version: ARCH 416. Offered Spring. Instructor(s): White-Bryson.

**ARCH 617 LANDSCAPE AND SITE STRATEGIES FOR HOUSTON (3)**

This course is a workshop in site planning, with Houston as its focus. It will allow students to gain practice assessing, cataloging, and communicating the many complex issues that go into plugging a building into a site. We will navigate the networks created by natural environments, the build and legal environments, and access. The final product of this course is a site plan. Graduate/Undergraduate version: ARCH 317. Limited enrollment. Offered Spring. Instructor(s): Albert; Whitehead.

**ARCH 618 SEMINAR IN ADVANCED MATERIALS AND SYSTEMS (3)**

The purpose of this course is to explore the architectural potential of advanced materials and systems through a combination of research and fabrication. Students will be responsible for choosing a material or system, developing a history of the material/system's development and use, making a class presentation, and developing a web description of the material/system to be included in a class web page. Simultaneously, students will be required to contact both manufacturers and local fabricators in order to put together a small demonstration project, illustrating the material/system's potential. Offered Spring. Instructor(s): Wittenberg.

**ARCH 619 DOING THE JITTERBUG (3)**

The goal of this course is to probe this spectrum for opportunities to develop an invigorated notion of form and structure, one that has the capacity to adjust and adapt, negotiating between fully-infused networked organizations and atrophying into the regularity of planar surfaces. The work will be focused on a basic design problem: how to produce controlled transformations of a given geometrical module and how to create continuity between organizational states. In contradistinction to either the geodesic logic, where repetition is privileged, or the logics of formal techniques of singular objects—the course will focus on developing an approach to architectural substance, which has the capacity to operate on several scales and attain the several phase transitions within a coherent organization. Graduate/Undergraduate version: ARCH 419. Offered Fall. Instructor(s): Lee.

**ARCH 620 HISTORY OF BUILDING TECHNOLOGY/PARIS PROGRAM (10)**

Advanced issues in building design and urban infrastructure using Paris as context. Exploration of compound design processes resulting in the development of complex building typologies. Offered Fall & Spring. Instructor(s): Casbarian; Fitzsimons.

**ARCH 622 METHODS OF MAKING (3)**

Graduate/Undergraduate version: ARCH 322. Offered Spring. Instructor(s): Guthrie.

**ARCH 623 PROFESSIONALISM AND MANAGEMENT IN ARCHITECTURAL PRACTICE (3)**

Graduate/Undergraduate version: ARCH 423. Offered Spring. Instructor(s): Fleishacker; Furr.

**ARCH 627 BUILDING WORKSHOP I (3)**

Graduate/Undergraduate version: ARCH 327. Repeatable for Credit. Offered Fall. Instructor(s): Samuels; Grenader.

**ARCH 632 INTRODUCTION TO COMPUTERS IN ARCHITECTURE (3)**

Lectures and seminars dealing with problem-solving activities and methodological issues in architectural design and urban design. Offered Fall.

**ARCH 634 BUILDING WORKSHOP II (3)**

Graduate/Undergraduate version: ARCH 334. Repeatable for Credit. Offered Spring. Instructor(s): Samuels; Satterfield

**ARCH 635 ARCHITECTURAL COMPUTER GRAPHICS OVERVIEW (3)**

Special projects for advanced students in computer applications. Graduate/Undergraduate version: ARCH 435. Must be enrolled in one of the following Major(s): Architecture. Offered Fall & Spring. Instructor(s): L. Koehler; P. Koehler.

**ARCH 639 THREE DIMENSIONAL COMPUTER GRAPHICS (3)**

Graduate/Undergraduate version: ARCH 439. Offered Fall. Instructor(s): Robinson.

**ARCH 641 THE STRUCTURE OF SPACE: TECHNOLOGY SEMINAR (3)**

Graduate/Undergraduate version: ARCH 441. Offered Fall. Instructor(s): Lally.

**ARCH 644 CONSTRUCTION AND DESIGN (3)**

Graduate/Undergraduate version: ARCH 344. Offered Spring. Instructor(s): Parsons.

**ARCH 645 ARCHITECTURE AND THE CITY I (3)**

Graduate/Undergraduate version: ARCH 345. Offered Fall.



**ARCH 646 19TH-20TH CENTURY ARCHITECTURAL HISTORY (3)**

This course is an overview of modern architecture with reference to related issues in cultural modernity. The course will consider important work of the 19th and 20th century, although reference will be made to earlier material where it bears on the issues under discussion. The course begins with the claim that the architecture of modernity has historically been conceived and developed in relation to utopian ideals, and that architectural modernism cannot be adequately understood unless attention is paid to its various utopian and dystopian 'moments'. Cross-listed with HART 506. Graduate/Undergraduate version: ARCH 346. Pre-requisite(s): ARCH 345 or ARCH 645. Offered Spring. Instructor(s): el-Dahdah.

**ARCH 648 TESTING, TESTING, 1,2,3 (3)**

Based on the tension implicit in this perceptual/material shift, this seminar seeks to straddle this divide through the strategic deployment of digital fabrication techniques in the design and construction of form active structural surfaces. The objective of the seminar is to engage digital fabrication in two ways. First, to explore a conceptual framework and a technical model of modulating continuous structural surfaces that does not really rely on self-similar modularity. Second, to investigate material assemblies that not only enable new forms and material effects, but also sublimate the hierarchical separation of skin and frame. Offered Spring. Instructor(s): Lee.

**ARCH 653 PHOTOGRAPHY FOR ARCHITECTS (3)**

Graduate/Undergraduate version: ARCH 353. Offered Fall. Instructor(s): White.

**ARCH 654 20TH CENTURY NORTH AMERICAN ARCHITECTURE (3)**

Graduate/Undergraduate version: ARCH 454. Offered Fall & Spring.

**ARCH 655 HOUSING AND URBAN PROGRAMS: ISSUES IN POLICY (3)**

This course will explore current issues in the formulation and implementation of housing and urban development programs in the U.S. Class members will each select a specific topic within a general policy area and make oral presentation to the class as well as submit a written paper on the topic at the end of the semester. Graduate/Undergraduate version: ARCH 455. Offered Fall & Spring. Instructor(s): Lord.

**ARCH 657 AFFORDABLE HOUSING: A PRACTICUM IN DEVELOPMENT (3)**

To give the students a practical experience in developing an affordable housing project from conception through design, financing, and construction. Lecturing by instructor on Federal, State, and local legislation and regulations as well as private sources of financing, and guiding students in real life situations with architects, contractors, and clients. Field trips to affordable housing sites and guest lectures by qualified experts. Limited enrollment. Offered Fall. Instructor(s): Lord.

**ARCH 658 CAST MODERNITY (3)**

Graduate/Undergraduate version: ARCH 358. Offered Spring. Instructor(s): Oliver.

**ARCH 659 MODERN BRAZIL (3)**

This seminar will be conducted as a research workshop with the aim of developing publication projects on three principal architects in Brazil's architectural modernity: the urbanist, Lucio Costa, the architect, Oscar Niemeyer, and the landscape architect, Roberto Burle Marx. The first half of the semester will consist of surveying modern architecture in Brazil, which will be followed by a closer look at the work of Costa, Niemeyer, and Burle Marx. In the second half of the semester, we will look into a particular forms of architectural publication, the 'Complete Works' in order to develop a format appropriate to the production of the three figures in question. This will lead to specific research projects that will deal with the archival care of architectural records, 3D modeling of unbuilt projects, and theoretical strategies for interpretive approaches to work. Limited enrollment. Offered Fall. Instructor(s): el-Dahdah.

**ARCH 663 ARCHITECTURAL REPRESENTATION (3)**

A semester long workshop designed to impart skills in free-hand drawing, with an emphasis on architectural subjects. The course will consist of in-class sketching exercises and out-of-class drawing assignments. Repeatable for Credit. Offered Fall. Instructor(s): Cannady.

**ARCH 665 CONVERSATIONS: VISITING CRITIC SEMINAR (3)**

Seminars structured around topics dealing with design theory, with special emphasis on participation by visiting critics and professors. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Visiting critics.

**ARCH 667 GRADUATE SEMINAR: CRITICISM AND ARCHITECTURE (3)**

The seminar will examine the history of critical writings on architecture from the 18th century to the present, consider the various categories used to criticize, such as aesthetics, politics, and technology, and analyze the role that architectural criticism has played in a general cultural context, keeping an eye on parallel trends in the theory of criticism in other disciplines. Offered Fall & Spring.

**ARCH 668 SEMINAR: TECHNOLOGY AND SOCIETY (3)**

This research-based seminar is a quod libet course open to graduates and undergraduates alike. The course will place heavy emphasis on weekly writing and reading and formal research techniques. Students will select their own research topics and will develop written and graphic materials for seminar presentations and publication. Finished materials will be prepared for, and presented at, every class meeting. It is encouraged that this course be used in conjunction with a design studio, as a research, theory, and development arm. Graduate/Undergraduate version: ARCH 368. Offered Spring. Instructor(s): Kwinter.

**ARCH 669 CASE STUDY IN URBAN DESIGN: BRASILIA (3)**

Graduate/Undergraduate version: ARCH 469. Offered Fall. Instructor(s): el-Dahdah.

**ARCH 671 ISSUES IN COMPUTER AIDED DESIGN (3)**

The class will produce an interactive creative multimedia CD-ROM project about the City of Houston: an investigative multi-dimensional map of the city and its population. We will explore various issues such as content creation and its presentation, interface design, and ease of use. Students will conceive the structure, do the investigative research with the city, write, direct, and edit content (text, images, video, computer graphics, etc.). Offered Fall & Spring.

**ARCH 674 THE JOY OF MATERIALS (3)**

Graduate/Undergraduate version: ARCH 374. Limited enrollment. Offered Spring. Instructor(s): Jimenez.

**ARCH 681 THE IDEA OF HOUSING (3)**

Graduate/Undergraduate version: ARCH 481.

**ARCH 682 REPOSITIONING THE SEAM (TECHNOLOGY SEMINAR) (3)**

The class will explore through the use of surface modeling software and CAD modeling tools how various techniques of articulating form, in relation to programmatic performance, affects, the visual, formal and spatial organization of the places we inhabit. With the use of surface modeling programs CAD drafting tools, a heavy emphasis will be placed on articulating the work through graphic techniques before being applied to physical models. The class will be run in small groups of 2-3 people. The initial weeks of the class will be spent looking to precedents, which explore various techniques from the precedents on a single space or series of space. Each team will then focus these various techniques from the precedents on a single space or series of space. With each group focusing on the same space, each with a separate emphasis, a juxtaposition of results will occur allowing for a comparison that looks to implications on the visual, performative, and organizational systems. Offered Spring. Instructor(s): Lally.

**ARCH 683 TWENTIETH CENTURY IDEAS OF ARCHITECTURE (3)**

Graduate/Undergraduate version: ARCH 483. Offered Fall. Instructor(s): Last.

**ARCH 684 CONCEPTUAL ART AND ARCHITECTURE (3)**

The first part of the course will examine the conceptual art practices that begin in the 1960s including: Bochner, Kosuth, Art and Language, LeWitt, Maacke, Kelly and Smithson. The second part of the course will focus on the question of what constitutes a conceptual architecture by interrogating a series of potential practices including: Super Studio, Archigram, Eisenman, Libesking, Shinohara, Heiduf, Tschumi and others. Graduate version of ARCH 384. Graduate/Undergraduate version: ARCH 384. Offered Spring. Instructor(s): Last.

**ARCH 685 ARCHITECTURE AND SOCIETY I (ANTIQUITY THROUGH 17TH CENTURY) (3)**

Through a series of case studies, this course will examine the socio-cultural consequences of exemplary buildings from Antiquity through the 17th Century. Graduate/Undergraduate version: ARCH 485. Offered Fall. Instructor(s): Hight.

**ARCH 686 INTERPRETING BUILDINGS (3)**

Graduate/Undergraduate version: ARCH 386. Instructor permission required.

**ARCH 691 ARCHITECTURAL PROBLEMS: SEMINAR (3)**

Repeatable for Credit. Offered Fall. Instructor(s): Cannady.

**ARCH 692 PROBLEMS IN KNOWLEDGE AND DESIGN (3)**

This course will present a series of lectures on the physics and metaphysics of creation and genesis from a wide variety of perspectives and disciplines, slowly sewing them together with a general and nonclassical approach to form. Graduate/Undergraduate version: ARCH 492. Offered Spring. Instructor(s): Kwinter.

**ARCH 695 BODIES OF KNOWLEDGE IN CONTEMPORARY AND LATE 20TH CENTURY ARCHITECTURE (3)**

Both experimental and normative architectural discourse/design operates through a complex relationship to something referred to as "the body", informing the discipline's relationship to other fields of knowledge, technologies of subjectivity, and problems of epistemology and ontology. The course examines this relationship by developing a transdisciplinary history of the body in architecture for modernity, in the process exploring what that last phrase would mean. Instructor(s): Hight.

**ARCH 700 PRACTICUM (3)**

Full-time internship service in approved local offices under interdisciplinary supervision. Emphasis on real world design, planning, or research experiences. Special tuition. May be taken in any semester or in summer. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Advisor.

**ARCH 702 PRE-THESIS PREPARATION (3)**

Offered Spring. Instructor(s): Pope.

**ARCH 703 DESIGN THESIS STUDIO (13)**

Offered Fall.

**ARCH 705 WRITTEN THESIS RESEARCH (3)**

Offered Fall & Spring.

**ARCH 706 WRITTEN THESIS (13)**

Offered Fall &amp; Spring.

**ARCH 711 SPECIAL PROJECTS (1 TO 9)**

Independent research or design arranged in consultation with a faculty member subject to approval of the student's faculty advisor and director. Repeatable for Credit. Offered Fall &amp; Spring.

**ARCH 714 INDEPENDENT DESIGN PROJECTS (1 TO 9)**

Repeatable for Credit. Offered Fall &amp; Spring.

**ARCH 800 GRADUATE RESEARCH (3 TO 12)**

Repeatable for Credit. Offered Fall &amp; Spring.

**ARTS (VISUAL ARTS)****School of Humanities/Visual and Dramatic Arts****ARTS 101 DRAWING FOR THE NON ART-MAJOR (3)**

Drawing for the Non Art Major is intended to introduce basic, fundamental art practice to students not intending to major in art. This course will work to develop perceptive and interpretive skills - working both inside and outside traditional thought - to translate three-dimensional objects into two-dimensional work. Students will work in multiple black and white media and will be introduced to linear perspective and artistic composition. Students will be required to participate in class discussions and critiques. Space is limited. Registration does not guarantee a space in class. The final course roster is formulated on the first day of class by the individual instructor. Course equivalency: ARTS 225.

**ARTS 102 CREATIVE 3-D DESIGN (3)**

Study of the elements and principles of design. Three-dimensional problems are introduced. Space in studio classes is limited. Registration does not guarantee a place in class. The class is formulated on the first day of class by the individual instructor. Cross-listed with ARCH 102. Instructor(s): Smith.

**ARTS 176 THE CHEMISTRY OF ART (3)**

The chemistry of the materials and methods used to create, conserve and authenticate art objects will be presented. Topics will include sculpture, painting, photography, textiles, jewelry, furniture, etc. Taught in conjunction with the Conservation Department and staff of the MFAH. Some classes will be held in the MFAH or HMNS. Cross-listed with CHEM 176. Offered Spring. Instructor(s): Whitnire.

**ARTS 205 PHOTOGRAPHY I (3)**

Introduction to black & white photography with a 4"x5" view camera through exploration of light-sensitive materials, film developing, and printmaking. Assignments include viewing, analysis, discussion, and writing about pictures for the purpose of finding a balance of visual awareness, technical skills, and meaning in the context of photography's continuing history. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Winningham.

**ARTS 206 PHOTOGRAPHY II (3)**

Continued exploration of the basic materials and processes of the photographic medium. Includes viewing, analysis, and discussion of the medium's history and current trends. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Winningham.

**ARTS 216 35MM PHOTOGRAPHY (3)**

Introduction to 35mm photography. Space in studio class is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Winningham.

**ARTS 225 DRAWING I (3)**

This course introduces the student to techniques and materials, processes of drawing, and the use of drawing to explore the visual language of line, tone, composition, and linear and atmospheric perspective. Emphasis on learning to articulate form in space through observational studies using both wet and dry media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Course equivalency: ARTS 101.

**ARTS 291 SPECIAL PROBLEMS IN DESIGN: CREATIVE THREE-DIMENSIONAL (1 TO 3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit. Instructor(s): Smith.

**ARTS 293 SPECIAL PROBLEMS IN DRAWING (1 TO 3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 294 SPECIAL PROBLEMS IN STUDIO ART (1 TO 3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 295 SPECIAL PROBLEMS IN PHOTOGRAPY (1 TO 3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Winningham.

**ARTS 296 SPECIAL PROBLEMS IN FILM AND VIDEOTAPE MAKING (1 TO 3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Huberman.

**ARTS 301 PAINTING I (3)**

Study of problems in painting, both traditional and experimental, in various opaque media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Sparangana.

**ARTS 303 INTERMEDIATE PAINTING (3)**

Continuation of studies in painting, both traditional and experimental, in various opaque media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225 and ARTS 301.

**ARTS 304 PHOTOGRAPHIC MEDIA FOR ARTISTS (3)**

Guided exploration of traditional and non-traditional photographic media for students with prior experience in drawing, painting, printmaking, sculpture, or photography. Photographic media open for students' exploration will include, but not limited to, black and white silver printing, traditional photographic color printing, digital printing, and oil pigment on photographic images. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 205 or ARTS 225 or ARTS 301.

**ARTS 305 PHOTOGRAPHY III (3)**

Study of advanced problems in photography, with emphasis on the independent pursuit of projects submitted by the students. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Winningham.

**ARTS 306 PHOTOGRAPHY IV (3)**

Study of advanced problems in photography with emphasis on the independent pursuit of projects submitted by the students. Continuation of ARTS 305. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor permission required. Instructor(s): Winningham.

**ARTS 310 COLLABORATIVE PRINTMAKING (3)**

This course is designed to interactively educate the student about the collaborative print process beyond artistic dialog, allowing each student to work as artist-printmaker, economist, and business planner. The course will examine the process of taking artwork from the beginning concept to the finished product to the marketplace - all the while staying within a budget. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Broker.

**ARTS 311 INTAGLIO I (3)**

Instruction in black and white etching and photo etching. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Broker.

**ARTS 312 RELIEF I (3)**

Instruction in black-and-white linoleum prints. Includes advanced color methods. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Broker.

**ARTS 313 LITHOGRAPHY I (3)**

Instruction in stone and plate lithography in black-and-white. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Broker.

**ARTS 320 MONOTYPE I (3)**

Introduction to Monotype. Includes black-and-white and color Monotype printing. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Broker.

**ARTS 323 INTERMEDIATE STUDIO DRAWING I (3)**

Intermediate studio drawing I will focus on developing drawing skills at the more advanced level, with emphasis on writing and critiques to develop a conceptual basis for personal expression. This course will be supplemented with guest artist lectures and critiques with intensive drawing study. Enrollment will be determined by portfolio review; therefore, students must bring examples of their drawing to the first class meeting.

**ARTS 324 INTERMEDIATE STUDIO DRAWING II (3)**

Intermediate Studio Drawing II is designed to give students the optimum learning experience in drawing at the more advanced level. This course will provide a diverse and intense depth of instruction in the methodologies of drawing. This course will be supplemented with guest artist lectures and critiques with intensive drawing study. Enrollment will be determined by portfolio review; therefore, students must bring examples of their drawing to the first class meeting. Offered Spring.

**ARTS 325 LIFE DRAWING (3)**

Instruction in drawing from the model in various media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Keeton.

**ARTS 326 COLLAGE (3)**

Collage has been an influential component of modern art since the Cubist first pasted found papers onto their canvases in 1908. The deceptively simple technique affected almost every 20th century art movement including Constructivism, Dada, Surrealism, Pop, Situationism, and contemporary digital practice. This course traces the history of collage, assemblage, and montage through slides, films, and museum visits. Students will be expected to maintain a consistent studio practice in collage and take part in class critiques and discussions. Offered Spring. Instructor(s): Keeton.

**ARTS 327 DOCUMENTARY PRODUCTION (3)**

Study of the expressive possibilities of documentary production using digital systems. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Huberman.

**ARTS 328 FILMMAKING I (3)**

Dramatic film production class that requires the making of one digital video and one 16mm film. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 327. Instructor(s): Huberman.

**ARTS 329 FILM FORM (3)**

Viewing, analysis, and discussion of modern and classic films. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Huberman.

**ARTS 330 INTERMEDIATE STUDIES: POP ART & ITS ORIGINS:****ENGLAND & AMERICA C. 1955-1968 (3)**

Pop Art whether American, British, or European, had - and has as its underlying and unifying agenda - a commentary or critique concerning the impact of "popular" culture (film, television, advertising, music, fashion, etc.) on contemporary society, especially in creating a new synthesis of "popular" and "high" culture in the visual arts. This, in part, was a reaction against the lofty, idealistic aspirations of post-war abstraction. This course will examine the philosophical and aesthetic origins and development of what came to be known as Pop Art.

**ARTS 331 POSTMODERNISM: ART FROM 1976 TO PRESENT (3)**

Several influences reenergized the art scene in the late 1970s. Among the most significant were a new presence of European art and a new generation of American artists, accompanied by a return to figurative painting, the growth of the Feminist art scene, and new tendencies in abstraction. This course examines the artists, forms, and terms that have emerged since Documenta VII, held in Kassel, Germany in 1982. Among the many artists covered are Baselitz, Beuys, Chia, Clemence, Cucchi, Fischl, Lucian, Freud, Gilbert and George, Kiefer, Longe, Marianni, Richter, Salle, Schnabel, and Sultan.

**ARTS 340 COLOR DRAWING: WATERCOLOR AND PASTEL (3)**

Introduction to color using still life and various media (e.g., pastel and watercolor). Space in studio classes is limited. Registration does not guarantee a place in class. class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Poulos.

**ARTS 345 COLOR PHOTOGRAPHY I (3)**

Study in the fundamentals of color photography. Includes problems in exposing color negative and transparency film, as well as photographic and digital color printing. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the instructor. Pre-requisite(s): ARTS 205 and ARTS 206. Instructor(s): Wingham.

**ARTS 346 COLOR PHOTOGRAPHY II (3)**

Study in the fundamental techniques of color photography. Includes special problems in color camera work, color negative and transparency processing, and color printing. Continuation of ARTS 345. Space in studio class is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 205 and ARTS 206. Instructor(s): Winningham.

**ARTS 349 PRINTMAKING I (3)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Pre-requisite(s): ARTS 225. Instructor(s): Broker.

**ARTS 350 SPECIAL PROBLEMS IN PRINTMAKING (1 TO 6)**

Study of problems at the introductory level in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Broker.

**ARTS 365 SCULPTURE I (3)**

Exploration of sculpture in wood, metal, and other sculptural media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Smith.

**ARTS 366 SCULPTURE STUDIO (3)**

Exploration of sculpture in wood, metal, and other sculptural media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 365. Instructor(s): Smith.

**ARTS 381 DIGITAL PHOTOGRAPHY I (3)**

An introduction to taking pictures with digital cameras and processing them with Adobe Photoshop. Assignments encourage visual awareness, technique comprehension, and an essential understanding of picture making in the context of photography's continuing history. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Prerequisite(s): ARTS 205. Instructor(s): Hester.

**ARTS 385 SPECIAL PROBLEMS: PHOTOGRAPHY SEMINAR (3)**

Advanced problems in photography including, but not limited to color and black and white film-based photography, view camera, and alternative processes. Individual students will be given advanced assignments tailored to the format and medium they wish to pursue. In addition, all students in the course will participate in scheduled critiques of the full class. Space in the class is limited. Registration does not guarantee a place in the course. Priority will be given to students who have taken two or more semesters of photography at Rice. The class roster will be formulated by the instructor on the first day of class. Instructor(s): Winningham.

**ARTS 389 THE ORIGINS OF MODERNISM: 1886-1914 (3)**

This course traces the development of early Modernism through the Neo- and Post-Impressionist movements represented by such seminal artists as Van Gough, Gauguin, Seurat, and Cezanne. The other great, even greater, movement of the same period, Symbolism, will also be carefully examined as well as the works of such artists as Moreau, Redon, Munch, Hodler, and Ensor. The beginning of the twentieth century sees the acceleration of radical movements such as Fauvism, Cubism, Expressionism, Orphism, and Futurism, represented by Picasso, Matisse, Braque, Rousseau, and Boccioni. The course will end with the first generation of Abstract artists: Kupka, Kandinsky, Malevich, and Modrian on the eve of the First World.

**ARTS 390 INVESTIGATIVE DRAWING: THEORY AND PRACTICE (3)**

Examination of the basic principles of drawing and representation, with emphasis on studio practice, art history, and theory. Includes categories of representation (e.g., still life, landscape, and figure) and the process of making drawings, as well as related readings, group discussions, and writing assignments. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor.

**ARTS 391 SPECIAL PROBLEMS IN DRAWING (1 TO 3)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 392 SPECIAL PROBLEMS IN LIFE DRAWINGS (1 TO 3)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 393 SPECIAL PROBLEMS IN PAINTING (1 TO 3)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 394 SPECIAL PROBLEMS IN PRINTMAKING (1 TO 6)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Broker.

**ARTS 395 SPECIAL PROBLEMS IN PHOTOGRAPHY (1 TO 6)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 396 SPECIAL PROBLEMS IN FILM AND VIDEOTAPING (1 TO 3)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Huberman.

**ARTS 397 SPECIAL PROBLEMS IN SCULPTURE (1 TO 6)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Smith.

**ARTS 398 SURVIVAL GUIDE FOR THE EMERGING ARTIST (3)**

The purpose of this course is to prepare undergraduate art majors to develop and cultivate behavior, habits, and methods through which to best represent themselves and their work in a professional environment within the contemporary art world. The course will focus on the curriculum vitae, photographic records, presses, books, catalogues, as well as general tax issues, resale certificates, basic financial planning, web design, and the use of presentational tools such as PowerPoint. Students will learn how to write cover letters, artistic statements, press releases, and project proposals related to grants and/or residencies. This course is intended for visual art majors. Must be enrolled in one of the following Major(s): Visual and Dramatic Arts. Instructor permission required.

**ARTS 399 EARTHWORKS AND SITE-SPECIFIC ART (3)**

This course will examine the proliferation of earthworks: land art and site-specific art since the late 1960s. These various works have become influential in many ways, especially in garden and urban design. The course will overview ancient site-specific works, usually religious or assumed religious sites: Paleolithic cave art and Stonehenge, as well as pyramids in Egypt, the Middle East and Central America, nazca line drawings, etc. However, the emphasis will be on the American art, particularly those seminal works constructed in the remote desert areas.

**ARTS 411 INTAGLIO II (3)**

Black-and-white etching and photo etching at the advanced level. Space in the studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225 and ARTS 311. Instructor(s): Broker.

**ARTS 412 RELIEF II (3)**

Instruction in black-and-white linoleum prints at the advanced level. Includes advanced color methods. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225 and ARTS 312. Instructor(s): Broker.

**ARTS 413 LITHOGRAPHY II (3)**

Instruction at the advanced level in stone and plate lithography in black-and-white and color. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225 and ARTS 313.

**ARTS 420 MONOTYPE II (3)**

Advanced Monotype processes; emphasis on color and drawing techniques. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225 and ARTS 320. Instructor(s): Broker.

**ARTS 423 SPECIAL PROBLEMS IN PAINTING (1 TO 3)**

Study of problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 425 ADVANCED DRAWING (3)**

An advanced level course for experiencing the art of drawing by working in an expensive format. By using, but not limited to, traditional materials, students will be encouraged to explore the language of drawing in contemporary art making. Emphasis will be on individual project development and staying with ideas to observe, investigate, and document evolutions in the work. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 225. Instructor(s): Sparagana.

**ARTS 426 STUDIO SUBJECTS: STILL LIFE/SELF-PORTRAITURE (3)**  
A studio class with in-depth exploration of still life and self-portraiture painting problems. The students will be expected to develop a body of work using water-based mediums, collage, and different surfaces. There will be discussions/critiques of the students' work using historical concepts of past masters of both studio subjects. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Poulos.

**ARTS 427 DOCUMENTARY PRODUCTION II (3)**  
Advanced documentary production using digital camera and editing systems. Continuation of ARTS 327. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Huberman.

**ARTS 428 FILMMAKING II (3)**  
Completion of one major film project by each student, using either video or 16mm film. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Huberman.

**ARTS 432 FILM GENRE: THE WESTERN (3)**  
Survey of the essential American film experience spanning all the years of U.S. cinema, with emphasis on the western and its mythic function in society. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Huberman.

**ARTS 443 SPECIAL PROBLEMS IN DESIGN (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Smith.

**ARTS 445 SPECIAL PROBLEMS IN DRAWING (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 447 SPECIAL PROBLEMS IN LIFE DRAWING (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 449 PRINTMAKING STUDIO (3)**  
Exploration of etching, lithography, photogravure, and monoprinting. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Broker.

**ARTS 450 SPECIAL PROBLEMS IN PRINTMAKING (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Broker.

**ARTS 452 SPECIAL PROBLEMS IN PAINTING (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 454 SPECIAL PROBLEMS - PHOTOGRAPHY (1 TO 6)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit.

**ARTS 456 SPECIAL PROBLEMS IN FILMMAKING (1 TO 6)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Huberman.

**ARTS 457 SPECIAL PROBLEMS IN SCULPTURE (1 TO 3)**  
Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Smith.

**ARTS 465 SCULPTURE I (3)**  
Study of advanced problems in various sculptural media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Prerequisite(s): ARTS 365 and ARTS 366. Instructor(s): Smith.



**ARTS 466 SCULPTURE STUDIO (3)**

Study of advanced problems in various sculptural media. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 365 and ARTS 366. Instructor(s): Smith.

**ARTS 475 ADVANCED PAINTING (3)**

Study of advanced problems in painting, with emphasis on independent development and participation in class critiques. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Pre-requisite(s): ARTS 301 and ARTS 303. Limited enrollment. Instructor(s): Poulos.

**ARTS 482 DIGITAL PHOTOGRAPHY II (3)**

A continuation of ARTS 381, this course will introduce electronic media as a tool for artistic production. Students will learn more advanced uses of Adobe Photoshop as it relates to production of image making and new media applications. Space in studio classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of classes by the individual instructor. Prerequisite(s): ARTS 381. Offered Spring. Instructor(s): Hester.

**ARTS 489 MODERNISM BETWEEN THE WARS: 1918-1940 (3)**

The interwar period, as a whole, is the most understudied period of Modernism—due in good part to the fact that it encompasses a violent, and ultimately tragic, period of western history. This course will focus on two major artistic movements between 1918 and 1940: Dada/Surrealism and International Constructivism. Both movements continue to exert an active influence on art and culture to the present day in the visual arts, poetry, and literature, and movies and television. Continuation of ARTS 389. Offered Fall.

**ARTS 494 SPECIAL PROBLEMS IN PRINTMAKING (1 TO 3)**

Study of advanced problems in creative art. Topics may vary. Please consult with the department for additional information. May be used in awarding transfer credit. Prerequisite: permission of instructor. Instructor permission required. Repeatable for Credit. Instructor(s): Broker.

**ARTS 499 VISUAL AND DRAMATIC ARTS SENIOR EXHIBITION/  
THEATRE PRODUCTION PROJECT (1)**

Required seminar for senior Visual and Dramatic Arts majors. This one credit hour course is designed to guide the senior Visual and Dramatic Arts major in the preparation of their work for the annual senior art exhibition held in the Rice University Art Gallery during commencement week and/or final Theatre Program play production. Prerequisites: Students must receive permission from their faculty advisor or department chair to register for this course; only Visual and Dramatic Arts majors who have senior academic standing will be allowed to register for this course. Offered Spring.

**ASIA (ASIAN STUDIES)****School of Humanities/Asian Studies****ASIA 140 INTRODUCTION TO CHINESE RELIGIONS (3)**

Surveys major Chinese religious traditions of Confucianism, Daoism and Buddhism. Readings will include philosophical texts, historical and anthropological studies, as well as popular literature. Cross-listed with RELI 140.

**ASIA 211 INTRODUCTION TO ASIAN CIVILIZATIONS (3)**

Introduction to the great cultural traditions of Asia, past and present, with emphasis on evolving religious and philosophical traditions, artistic and literary achievements, and patterns of political, social, and economic change. Cross-listed with HIST 206.

**ASIA 221 LIFE OF THE PROPHET MUHAMMAD (3)**

This course will examine the life of the Prophet Muhammad, focusing on its significance for Muslims and for non-Muslims. Readings in The Qur'an, Ibn Hisham, and Haykal. Cross-listed with RELI 221.

**ASIA 230 ASIAN RELIGIONS IN AMERICA (3)**

A survey course on Hinduism, Buddhism, Taoism, and Jainism in America, from the colonial period to the present, with a special focus on American metaphysical religion, the counterculture, the New Age, and the history of Western Colonialism, transcultural encounter, translation and immigration. Cross-listed with RELI 230.

**ASIA 231 THE ENLIGHTENMENT OF THE BODY (3)**

Beginning with a historical survey of the American metaphysical tradition, this course turns to a close study of the Esalen Institute in Big Sur, California, as a unique window into some of the different ways the tradition has appropriated Asian religions, psychological models of the unconscious, and contemporary scientific paradigms. Cross-listed with RELI 231.

**ASIA 232 RELIGIONS FROM INDIA (3)**

This course will survey the religions of India, namely Hinduism, Buddhism, Jainism, Christianity, Islam, and Sikhism. Emphasis will be placed on the study of scriptures of these traditions and their continuing global relevance, particularly in American history and culture. Cross-listed with RELI 232.

**ASIA 240 GENDER AND POLITICIZED RELIGION (3)**

This course examines the emergence of religion-based politics in various Asian countries-particularly Hindu and Muslim-focusing on the women participants in these movements as well as the movements' concern with gender roles in society. We will investigate, for instance, the extent to which women participants have been willing or able to reshape the central ideas of such movements. Cross-listed with SWGS 240. Course equivalency: ASIA 340.

**ASIA 250 MEDITATION, MYSTICISM, AND MAGIC (3)**

The course moves between Buddhist religious and Western psychological literature, analyzing these as models of human development, as guides to a meditative life or critiques of it, and above all as expressions of deeply rooted cultural proclivities. Reading Freud, Khakar, Milarepa, Norbu, Obeyesekere, Sutric and Tantric literature, Taylor and Wangyal. Cross-listed with RELI 250.

**ASIA 322 INTRODUCTION TO BUDDHISM (3)**

Exploration of the Buddhist traditions of India, Tibet, China, and Japan, emphasizing the relationship between styles of meditation, their philosophical perspectives, cultural context, and classic Buddhist texts. Graduate/Undergraduate version: RELI 572 Cross-listed with RELI 322.

**ASIA 323 THE KNOWING BODY: BUDDHISM, GENDER, AND THE SOCIAL WORLD (3)**

Western thought tends to regard mind and body dualistically, a view with significant impact on religious cultural, gendered and social processes. This course juxtaposes received Western assumptions with Buddhist perspectives (especially Tibetan Buddhist), mapping Western and Buddhist categories onto each other to better understand the implications of each. Cross-listed with RELI 323, SWGS 323.

**ASIA 330 INTRODUCTION TO TRADITIONAL CHINESE POETRY (3)**

This course seeks to decode enchanting features of traditional Chinese poetry through examining the transformation of poetic genres, the interaction between poetic creation and political, social and culture changes, and the close association of poetry with art. Thus, this course also serves to understand Chinese culture and history through poetic perspectives. All readings in English translation. Cross-listed with CHIN 330, MDST 370.

**ASIA 331 SOUTH ASIAN LITERATURE, POETRY, AND POPULAR CULTURE I (3)**

Focus will vary each year depending on both, the needs and interests of the students in the class, as well as contemporary issues. Readings range from classical, to modern 20th century literature and poetry. Various arts forms, including theater and film, will be thematically related to the readings. This course is taught in Hindi. Cross-listed with HIND 335. Pre-requisite(s): HIND 202 or permission of instructor. Limited enrollment. URL: <http://www.ruf.rice.edu/~gshah/adv.html>.

**ASIA 332 CHINESE LITERATURE AND ITS MOVIE ADAPTATIONS (3)**

Exploration of modern Chinese literature through the visual imagery of Chinese films to show how and why different time periods and different media affect the theme of a story. One third covers movie adaptations of classical Chinese literature. Films, subtitled in English, shown outside of class. All reading in English. Cross-listed with CHIN 332.

**ASIA 334 TRADITIONAL CHINESE TALES AND SHORT STORIES (3)**

Learning Chinese literature and culture through reading vernacular stories, fantastic tales, biographies, and philosophical parables. Discussion topics: literature and Confucianism, Taoism, and Buddhism; literature and history; self and other; fantastic world and reality; women as domestic aliens and aliens portrayed as women, etc. Readings are in English translation. Cross-listed with CHIN 334.

**ASIA 335 INTRODUCTION TO CLASSICAL CHINESE LITERATURE (3)**

Examination of the basic characteristics of classical Chinese novels, primarily through six important works from the 16th to 18th centuries: Water Margin, Monkey, Golden Lotus, Scholars, Romance of the Three Kingdoms, and Dream of the Red Chamber. Cross-listed with CHIN 335, MDST 375.

**ASIA 340 GENDER AND POLITICIZED RELIGION (ENRICHED VERSION) (3)**

This course examines the emergence of religion-based politics in various Asian countries-particularly Hindu and Muslim-focusing on the women participants in these movements as well as the movements' concern with gender roles in society. We will investigate, for instance, the extent to which women participants have been willing or able to reshape the central ideas of such movements. Cross-listed with SWGS 340. Course equivalency: ASIA 240.

**ASIA 344 KOREAN LITERATURE AND CULTURE (3)**

Exploration of selections from modern Korean literature and Korean films. Includes background survey of Korean history, philosophy and religion. All texts and films in English translation. No previous knowledge of Korean required. Cross-listed with HUMA 344, KORE 344. Instructor permission required.

**ASIA 345 LINGUISTIC STRUCTURE OF KOREAN (3)**

Focuses on the origin of Korean and related languages. It explores the way the Korean language evolved and interacted with other East Asian languages, including Chinese and Japanese. The sociolinguistic aspect of these languages will be studied, including the difference in male and female language usage and the honorific systems. Cross-listed with KORE 345, LING 345.

**ASIA 346 KOREAN CULTURE AND SOCIETY THROUGH MULTIMEDIA (3)**

This course introduces important elements of Korean culture and society through readings and multimedia. Topics are in the areas of history, philosophy, and family life around the early 20th century to the present. In addition, the class will explore the recent phenomenon of "Korea Wave" in Asia. Korean background is unnecessary. Cross-listed with KORE 346.

**ASIA 350 HISTORY AND POLITICS OF CENTRAL ASIA (3)**

This is an introduction to the history, culture, lands, peoples, and contemporary importance of Central Asia. Topics to be discussed include the Great Game, Sovietization, the Soviet invasion of Afghanistan, the War on Terror, and the new Great Game, the race for resources between Russia, China and the United States. URL: [lang.rice.edu/Ludwig/asia350/Asia350.html](http://lang.rice.edu/Ludwig/asia350/Asia350.html).

**ASIA 354 APOCALYPTIC AND MILLENARIAN MOVEMENTS IN PRE-MODERN ASIA (3)**

This course will focus upon the rich and neglected apocalyptic and millenarian traditions of Asia, discussing Hinduism, Buddhism, Zoroastrianism, Manichaeism and Eastern Christianity as each of these faiths interact with and react to each other. Readings will be from scriptures and translations covering approximately the period between the first and nineteenth centuries. Cross-listed with RELI 354.

**ASIA 360 TRANSNATIONAL CHINA: CHINA AND THE CHINESE DIASPORA (3)**

Exploration of the political, economic, and social forces changing the lives of nearly a quarter of humanity, the 1.4 billion people of Mainland China, Taiwan, Hong Kong, Singapore and the diasporic Chinese communities of East and Southeast Asia. Topics include political and economic liberalization, nationalism and urban identity, privatization and consumerism, environmentalism and public goods, and the globalization of communication technologies and Chinese cultural media. URL: [www.owl.net.rice.edu/~swlewis/asia360/](http://www.owl.net.rice.edu/~swlewis/asia360/).

**ASIA 361 THE ORIENTAL RENAISSANCE (3)**

This course will explore the European and American encounters with India from seventeenth-century France to twentieth-century America. Particular attention will be given to the translation of Sanskrit texts, the English and German Romantic traditions, the depth psychology of C.G. Jung, and the American New Age. Cross-listed with RELI 361.

**ASIA 363 THE MARRIAGE OF HEAVEN AND HELL (3)**

The history of mysticism is marked by symbolic systems and ritual practices suffused with erotic and ethical paradoxes. This course examines such themes in a wide variety of historical contexts, from Plato's dialogues and Blake's poetry to Christian mysticism, Hindu, and Buddhist Tantric traditions, and the modern study of religion. Cross-listed with RELI 363.

**ASIA 371 TRADITIONAL CHINESE PAINTING (3)**

This course examines Chinese painting from ancient times to the early twentieth century. Issues of examination include themes, styles, and functions of Chinese painting; the interrelationship between paintings and the intended viewers; regionalism; images and words; foreign elements in Chinese painting. Cross-listed with HART 371.

**ASIA 372 CHINESE ART AND VISUAL CULTURE (3)**

In this course, we will study how various artistic styles developed in historical, social and cultural contexts from the ancient period to the present day. Through the careful examination of architecture, calligraphy, painting, sculpture, ceramics, bronze, and film, students will gain a deeper understanding of Chinese art and visual culture. Cross-listed with HART 372.

**ASIA 374 ART & RELIGION IN CHINA (3)**

This introductory course examines the complex relationship between art and religion in China (4th - 19th centuries). Through an analysis of painting, sculpture, cave temples, steles, manuscripts, talismans, illustrated prints, and primary sources, we will explore the visual, religious and cultural dimensions of Buddhism and Daoism, and the fluid nature of Chinese culture. Cross-listed with HART 374, RELI 374.

**ASIA 389 MIGRATIONS AND DIASPORAS IN THE INDIAN OCEAN WORLD (3)**

The Indian Ocean World presents an enormously varied arena of cultural exchange and interaction spanning coastal regions of Africa, the Middle East, South and Southeast Asia and Australia. Seminar introduces the region by examining societies and empires shaped by voyages of exploration, religious pilgrimages, trading diasporas and forced migration. Cross-listed with HIST 389.

**ASIA 399 WOMEN IN CHINESE LITERATURE (3)**

This course examines women's roles in Chinese literature as writers, readers, and characters, focusing particularly on the tension between women's lived bodily experiences and the cultural experiences inscribed on the female body and how, in the process, women have contrarily gendered patriarchal culture into their own. It will also touch on Chinese women's incorporation of the Western Tradition. Cross-listed with MDST 379, SWGS 399.

**ASIA 401 INDEPENDENT STUDY (1 TO 15)**

Reading or research project to be determined by discussions between student(s) and faculty member(s).

**ASIA 402 INDEPENDENT STUDY (1 TO 15)**

Reading or research project to be determined by discussions between student(s) and faculty member(s).

**ASIA 403 INDEPENDENT STUDY (1 TO 6)****ASIA 422 THE ORIGINAL BEAUTY OF CHINESE LITERATURE (3)**

The course will expose students to the best literary works created in the Chinese tradition, both classical and modern, and give them a general introduction to different genres, including poetry, fiction, drama, and philosophical essays. It will improve their language proficiency through reading original texts of Chinese literature. Cross-listed with CHIN 422.

**ASIA 432 ISLAM IN SOUTH ASIA (3)**

Topics will include emergence of Indian Muslim society; Muslim responses to colonialism and the movement for Pakistan; and the role of Islam in politics in contemporary India, Pakistan, and Bangladesh. Requires no prior knowledge of Islam of South Asia. Cross-listed with HIST 432, SWGS 432.

**ASIA 441 MAGIC AND POPULAR RELIGION (3)**

This course will examine the popular religion in the Middle East from Late Antiquity until the 19th century, focusing on healing practices, astrology, protection, amulets, seasoned/life-cycle rituals, and other popular beliefs common to Islam, Judaism and Christianity. Cross-listed with RELI 441.

**ASIA 474 BOUNDARIES LATER CHINESE ART (3)**

This advanced class examines later Chinese art beyond the conventional dynastic, geographic, and media-based framework. We will discuss issues of boundaries and visualities, and review the historiographical and methodological issues involved in the study of Chinese art. Instructor permission required.

**ASTR (ASTRONOMY)****School of Natural Sciences/Physics and Astronomy****ASTR 100 EXPLORING THE COSMOS (1)**

Introduction to concepts and methods used in astronomy and astrophysics, with a theme of "Astrobiology - Life in the Universe." Will include student presentations and web page development. For first-year students intending to major in science or engineering.

**ASTR 201 STARS, GALAXIES, AND THE UNIVERSE (3)**

An introductory course for students in academic programs. The formation, evolution, and death of stars; the composition and evolution of galaxies; the structure and evolution of the universe.

**ASTR 202 EXPLORATION OF THE SOLAR SYSTEM (3)**

The physical processes governing the nature and behavior of the various Solar System bodies are discussed with a focus on the origins, evolution and fate of the Solar System and its parts. This broader context leads to a deeper understanding of the Earth as a life-supporting planet.

**ASTR 221 OBSERVING THE NIGHT SKY (1)**

Use of small telescopes and binoculars to study constellations, bright stars, planets and the sun at the campus observatory and at dark-sky sites. Modern analog and digital techniques will be used along with direct visual observation. Intended for students in academic programs. Pre-requisite(s): ASTR 100 or ASTR 201 or ASTR 202.

**ASTR 230 ASTRONOMY LAB (3)**

A hands-on introduction to modern techniques of observational astronomy. Students use telescopes, CCDs, and computers to obtain and analyze their own images of solar system, galactic, and extragalactic objects. This course involves field trips to dark sky observing sites such as George Observatory and makes extensive use of state-of-the-art data analysis software. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics. May not be seeking any of the following Degree(s): Bachelor of Arts, Bachelor of Science. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics, Physics or have permission of instructor.

**ASTR 243 EXPLORING THE SUN-EARTH CONNECTION (3)**

An introduction to astrophysical processes with a focus on the Sun-Earth interaction. Topics include the solar wind, sunspots, flares, and the Earth's diverse responses: magnetospheric storms, atmospheric expansion, and climate effects. The theoretical and observational basis of our current understanding will be presented at an introductory level. Pre-requisite(s): MATH 102 and PHYS 102 or PHYS 126.

**ASTR 350 INTRODUCTION TO ASTROPHYSICS-STARS (3)**

An introduction to celestial mechanics, radiative transfer, stellar structure, and stellar remnants (including black holes and neutron stars). Aspects of planetary science and solar system formation may also be explored. Together, ASTR 350 and ASTR 360 provide a comprehensive survey of modern astrophysics needed for senior research and graduate study in astronomy. Either ASTR 350 or 360 may be taken first. Pre-requisite(s): MATH 211.

**ASTR 360 INTRODUCTION TO ASTROPHYSICS-GALAXY AND****COSMO (3)**

Morphology, kinematics, and dynamics of the Milky Way and external galaxies, including interstellar matter and evidence for dark matter. Peculiar and active galaxies, including interacting systems and evidence for super massive black holes in active galactic nuclei such as quasars. Large-scale structure and expansion of the universe, including various cosmologies ranging from the inflationary big bang theory to steady state and anthropic concepts. Either ASTR 350 or 360 may be taken first. Prerequisite(s): MATH 211.

**ASTR 400 UNDERGRADUATE RESEARCH SEMINAR (1)**

Seminar on current research topics in astronomy, astrophysics, and space physics for juniors and seniors. Students will be expected to give one oral presentation each semester. Graduate/Undergraduate version: ASTR 500. Repeatable for Credit.

**ASTR 402 TEACHING EARTH AND SPACE SCIENCE (3)**

Overview of the Earth and the solar system, their structure, evolution, and dynamics. Fundamentals of Earth and Space Science topics as taught in 6th grade. Includes mathematics of solar motion at level of algebra and simple trigonometry. Includes teaching in use of Earth and solar system software and weather station software. This course is designed for science and math teachers (grades 6-12). One hour of lab per week. Graduate/Undergraduate version: EDUC 588.

**ASTR 403 ASTRONOMY FOR TEACHERS (3)**

Learn how to teach astronomy concepts as specified by the state of Texas. Methods to help students master content, including lab activities suitable for K-9 classrooms and as field trips. Topics vary with each offering. Graduate/Undergraduate version: EDUC 589.

**ASTR 430 TEACHING ASTRONOMY LABORATORY (3)**

Methods and facilities of observational astronomy for public education. Students will help train beginners in the use of telescopes and carry out a modest observational program. The course requires one public talk and internship work. Topics vary with each offering. Pre-requisite(s): ASTR 230 or ASTR 350 or ASTR 360 or permission of instructor.

**ASTR 450 EXPERIMENTAL SPACE SCIENCE (3)**

Study of instruments and methods used in space physics and astronomy. May include the electromagnetic spectrum, cosmic rays, neutrinos, magnetic fields, and particles in the solar system, as well as discussion of special techniques for remote sensing or for the analysis of massive astronomical data sets. Pre-requisite(s): ASTR 230 and (ASTR 350 or ASTR 360) or permission of instructor.

**ASTR 451 ASTROPHYSICS I: SUN AND STARS (3)**

Graduate/Undergraduate version: ASTR 551. Pre-requisite(s): ASTR 350 or ASTR 360 and PHYS 301 and PHYS 302.

**ASTR 452 ASTROPHYSICS II: GALAXIES AND COSMOLOGY (3)**

Graduate/Undergraduate version: ASTR 552. Pre-requisite(s): (ASTR 350 or ASTR 360) and PHYS 301 and PHYS 302.

**ASTR 470 SOLAR SYSTEM PHYSICS (3)**

The Sun, solar-terrestrial relationships, solar wind; planetary atmospheres, ionospheres and magnetospheres. Pre-requisite(s): PHYS 301 and PHYS 302.

**ASTR 500 GRADUATE SEMINAR (1)**

A presentation of current research programs in the department. Graduate/Undergraduate version: ASTR 400. Repeatable for Credit.

**ASTR 505 PROCESSES IN COSMIC PLASMAS (3)**

Study of plasma phenomena that occur widely in nature. May include quasi-static equilibrium, magnetic equilibrium, magnetic reconnection, particle acceleration, plasma winds and jets, and interchange instabilities. Pre-requisite(s): ASTR 470 and PHYS 480.

**ASTR 542 NEBULAR ASTROPHYSICS (3)**

The physics of emission nebulae, including radiative transfer, photo ionization and thermal equilibria, and internal gaseous dynamics. Physical processes in the interstellar medium.

**ASTR 551 ASTROPHYSICS I: SUN AND STARS (3)**

Physics of stellar interiors and atmospheres; solar phenomena. Concepts of stellar evolution. Graduate/Undergraduate version: ASTR 451.

**ASTR 552 ASTROPHYSICS II: GALAXIES & COSMOLOGY (3)**

The physics of interstellar matter; structure of the Milky Way and other normal galaxies; physical cosmology and high-red shift phenomena. Graduate/Undergraduate version: ASTR 452.

**ASTR 554 ASTROPHYSICS OF THE SUN (3)**

Analysis of physical processes at work in the sun, such as helioseismology, solar variability, solar activity, magnetic reconnection, heliosphere interactions and modern observational techniques.

**ASTR 555 PROTOSTARS AND PLANETS (3)**

Physics of star and planet information, including molecular cloud dynamics and chemistry, circumstellar accretion disks, jets, dust, debris disks, atmospheres rotation, and magnetic fields of young stars, binaries, brown dwarfs, comets, Kuiper belt objects, giant planet formation and discoveries of extra solar planets. Pre-requisite(s): ASTR 551.

**ASTR 565 COMPACT OBJECTS (3)**

Selected topics involving white dwarfs, neutron stars, black holes and their environments, e.g., pulsars, supernova remnants, and accretion disks.

**BIOE (BIOENGINEERING)****School of Engineering/Bioengineering****BIOE 112 FRESHMAN SEMINAR IN BIONANOTECHNOLOGY (3)**

This seminar course is intended for freshman and will provide an introduction to bionanotechnology. In addition to learning about cutting-edge research in nanotechnology, students will work to formulate solutions to medical problems using the tools of nanotechnology. Pre-requisite(s): CHEM 121 and PHYS 101. Offered Spring. Instructor(s): West.

**BIOE 252 BIOENGINEERING FUNDAMENTALS (3)**

Introduction to material, energy, charge and momentum balances in biological systems. Steady state and transient conservation equations for mass, energy, charge and momentum will be derived and applied using basic mathematical principles, physical laws, stoichiometry, and thermodynamic properties. Problem based learning groups will solve open-ended problems. Required for students intending to major in bioengineering. Pre-requisite(s): (PHYS 125 and PHYS 126) or (PHYS 101 and PHYS 102) and CHEM 121 and CHEM 122 and MATH 101 and MATH 102 and CAAM 210. Recommended co or prerequisite(s): MATH 211. Offered Fall. Instructor(s): Saterbak.

**BIOE 260 INTRODUCTION TO GLOBAL HEALTH ISSUES (3)**

To be considered for the course, you must submit a 250 word or less statement explaining your interests in the course and reasons for taking the course. Email Dr. Rebecca Richards-Kortum the Monday of the week of pre-registration. Epidemiology, pathophysiology, health systems and health economics, demography, medical ethics, humanitarian emergencies, role of media, justice, history of colonialism, scientific methods and engineering design, case studies of appropriate health technologies, role of WHO. Instructor permission required. Offered Spring. URL: [www.owlnet.rice.edu/~BIOE260](http://www.owlnet.rice.edu/~BIOE260). Instructor(s): Richards-Kortum.

**BIOE 301 BIOENGINEERING AND WORLD HEALTH (3)**

This course provides an overview of contemporary technological advances to improve human health. The course opens with an introduction to the epidemiology and physiology of the major human health problems throughout the world. With this introduction, we examine medical technologies to prevent infection, detect cancer and treat heart disease. We discuss legal and ethical issues associated with developing new medical technologies. The course is designed for non-engineering majors. Offered Spring.

**BIOE 303 ACCELERATED CELL AND MOLECULAR BIOLOGY (3)**

This course is intended for engineers and physical scientists who want to have a working knowledge of modern cell and molecular biology. Key concepts will be illustrated through examples in biotechnology and biomedicine. Prior coursework in biology is not required. Pre-requisite(s): CHEM 121. Offered Spring. Instructor(s): West.

**BIOE 320 SYSTEMS PHYSIOLOGY LAB MODULE (1)**

Exploration of physiologic systems through measurement of biologic signals. EEG, ECG, EMG pulmonary function tests, etc. are performed and analyzed. Students will explore physiologic concepts through computer simulations, data collection and analysis. Enrollment in or completion of BIOE 322 is expected. For students intending to major in Bioengineering. Pre-requisite(s): BIOE 252 or permission of instructor. Corequisite(s): BIOE 322 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Oden.

**BIOE 321 CELLULAR ENGINEERING (3)**

Introduction to engineering principles and modeling regulation and circuitry at the cellular level. Topics include genetic metabolic networks and cell surface interactions. Pre-requisite(s): BIOE 252 or permission of instructor. Offered Fall. Instructor(s): Diehl.

**BIOE 322 FUNDAMENTALS OF SYSTEMS PHYSIOLOGY (3)**

This course will teach the fundamentals of physiology at the organism, tissue, and cellular levels. Emphasis will be on engineering aspects of physiology. Cross-listed with BIOS 332. Pre-requisite(s): BIOS 201 and MATH 211. Offered Spring.

**BIOE 330 BIOREACTION ENGINEERING (3)**

The course is designed to provide fundamental knowledge in biochemistry and molecular biology needed by engineers. This course provides a survey of basic principles of biochemistry and molecular biology, emphasizing engineering applications and a broad understanding of chemical events in living systems in terms of metabolism and structure-function relationships of biologically important molecules. Prerequisite(s): BIOE 252. Offered Spring. URL: [www.owlnet.rice.edu/~bioe330/](http://www.owlnet.rice.edu/~bioe330/). Instructor(s): Fernandez.

**BIOE 332 THERMODYNAMICS (3)**

This course will be mathematically rigorous coverage of the fundamentals of thermodynamics with applications drawn from contemporary bioengineering problems. Advanced topics covered include thermodynamics of self assembly, the hydrophobic effect, polymer and membrane phase transitions, membrane transport, cell mechanics, electromechanical coupling in biological systems, nonequilibrium thermodynamics, open systems and statistical mechanics. Pre-requisite(s): BIOE 252 and BIOE 383 or permission of instructor. Offered Spring. Instructor(s): Raphael.

**BIOE 342 LABORATORY IN TISSUE CULTURE (1)**

Introduction to tissue culture techniques, including cell passage, cell viability, and cell attachment and proliferation assays. Sections 1 and 2 are taught during the first half of the semester. Sections 3 and 4 are taught during the second half of the semester. Your registration for this course will not be accepted until you obtain Dr. Saterbak's signature on an Undergraduate Special Registration Request form. Cross-listed with BIOS 320. Pre-requisite(s): BIOS 211 or BIOE 252 or permission of instructor. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Saterbak.

**BIOE 361 METABOLIC ENGINEERING FOR GLOBAL HEALTH ENVIRONMENTS (3)**

Importance of nutritional and pharmaceutical compounds, impact of cost of compounds on global health; overview of biochemical pathways; Genetic engineering and molecular biology tools for ME; Nutritional molecules; Pharmaceuticals (antibiotics, tamiflu-against influenza virus; anti-parasite compounds against malaria and filarial diseases; anti-diarrhea treatments). Pre-requisite(s): BIOE 260 and PHYS 126 and MATH 102. Offered Spring. Instructor(s): Bennett.

**BIOE 362 BIOENGINEERING FOR GLOBAL HEALTH ENVIRONMENT (3)**

Clinical trial design, regulation of medical technologies, medical technology assessment. Detailed case studies of vaccine development, diagnostic tests, cancer screening. Pre-requisite(s): BIOE 260 and PHYS 126 and MATH 102. Offered Spring. URL: [www.owl.net.rice.edu/~BIOE362](http://www.owl.net.rice.edu/~BIOE362).

**BIOE 365 SUSTAINABLE WATER PURIFICATION FOR THE DEVELOPING WORLD (1)**

This course is an introduction to several innovative methods of small-scale water purification, which is appropriate for implementation in the developing world. Through the different components of the class, students will acquire and hone a sustainable methodology for addressing global health problems in the developing world. Limited enrollment. Offered Spring. Instructor(s): Gordon.

**BIOE 370 BIOMATERIALS (3)**

This course will introduce both basic materials science and biological concepts with an emphasis on application of these basic principles to understanding the interactions between materials and biological systems. Topics covered include chemical structure of biomaterials, physical, mechanical and surface properties of biomaterials, biomaterial degradation, and biomaterial processing. Additional topics include protein and cell interactions with biomaterials, biomaterial implantation and acute inflammation, wound healing and the presence of biomaterials, immune responses to biomaterials, biomaterials and thrombosis, as well as infection, tumorigenesis and calcification of biomaterials. Pre-requisite(s): BIOE 252 or permission of instructor. Offered Fall. Instructor(s): Mikos.

**BIOE 372 BIOMECHANICS (3)**

The principles of biomechanics are central in the functions of the human body, including load-bearing, motion, normal and pathologic physiology, as well as healing. The objectives of this course are to introduce and analyze biomechanical principles using stress and strain, load and deformation, and material properties. Though the primary focus will be at the tissue level, the modern field of cell biomechanics will also be discussed. Additionally, aspects of the design and use of medical devices will be presented. Pre-requisite(s): BIOE 252 and MECH 211 or permission of instructor. Offered Spring. Instructor(s): Athanasiou.

**BIOE 381 FUNDAMENTALS OF ELECTROPHYSIOLOGY (3)**

Introduction to cellular electrophysiology. Includes the development of whole-cell models for neurons and muscle (cardiac, skeletal and smooth muscle) cells, based on ion channel currents obtained from whole-cell voltage-clamp experiments. Ion balance equations are developed, as well as, those for chemical signaling agents such as "second messengers." The construction of small neuron circuits is discussed. Volume conductor boundary-value problems frequently encountered in electrophysiology are posed, and solutions obtained based on adequate descriptions of the bioelectric current source and the volume conductor (surrounding tissue) medium. This course provides a basis for the interpretation of macroscopic bioelectric signals such as the electrocardiogram (ECG), electromyogram (EMG) and electroencephalogram (EEG). Cross-listed with ELEC 381. Instructor(s): Clark.

**BIOE 383 BIOMEDICAL ENGINEERING INSTRUMENTATION (3)**

This is an introductory level course on fundamentals of biomedical engineering instrumentation and analysis. Topics include measurement principles; fundamental concepts in electronics including circuit analysis, data acquisition, amplifiers, filters and A/D converters; Fourier analysis; temperature, pressure, and flow measurements in biological systems. Pre-requisite(s): MATH 211 and BIOE 385 and (PHYS 126 or PHYS 102) and ELEC 243 and BIOS 201. Offered Fall.

**BIOE 385 BIOMEDICAL INSTRUMENTATION LAB (1)**

Students will gain hands on experience with building biomedical instrumentation circuits and systems. Students will learn the basics of lab view programming and signal analysis. Preregistration for sections is required during registration week. Corequisite(s): BIOE 383. Limited enrollment. Offered Fall. Instructor(s): Oden.

**BIOE 391 NUMERICAL METHODS (3)**

Introduction to numerical approximation techniques and statistical methods with bioengineering applications. Topics include error propagation, Taylor's Series expansions, roots of equations, numerical differentiation, ordinary differential equations, and partial differential equations. Matlab and other software will be used for solving equations. Pre-requisite(s): CAAM 210 and (MATH 211 or MATH 212). Offered Spring. Instructor(s): Igoshin.

**BIOE 400 UNDERGRADUATE RESEARCH (2 TO 3)**

Beginning undergraduate researchers learn about library and electronic resources, database and literature searches, reference management software training, lab safety training, how to keep a laboratory notebook, research ethics, writing a scientific paper and poster, and oral presentation skills. Independent investigation of a specific topic or problem in modern bioengineering research under the direction of a selected faculty member. Instructor permission required. Offered Fall & Spring.

**BIOE 401 UNDERGRADUATE RESEARCH (1 TO 4)**

Independent investigation of a specific topic or problem in modern bioengineering research under the direction of a selected faculty member. Pre-requisite(s): BIOE 400. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**BIOE 402 SUMMER UNDERGRADUATE RESEARCH (1 TO 4)**

Independent investigation of a specific topic or problem in modern bioengineering research under the direction of a selected faculty member. Instructor permission required. Repeatable for Credit.

**BIOE 405 INDEPENDENT RESEARCH/INTERNSHIP PROGRAM (0)**

This independent research course offers multi-disciplinary training in the area of cellular engineering within the Departments of Bioengineering and Biochemistry & Cell Biology. Areas of research will include engineering of hard and soft tissue formation, cardiovascular tissue engineering, engineering cell surface interactions regulating movement and metabolic engineering. Students will conduct independent research under the supervision of a faculty mentor.

**BIOE 410 CLINICAL MEDICAL INTERNSHIP (3)**

Students participate in clinical inpatient rounds, outpatient visits, operating room procedures and medical grand rounds. Designed to provide direct contact with the medical needs addressed by bioengineering. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Richards-Kortum; Follen.

**BIOE 415 CLINICAL RESEARCH INTERNSHIP (3)**

Students participate in clinical inpatient rounds, outpatient visits, operating room procedures and medical grand rounds. Designed to provide direct contact with the medical needs addressed by bioengineering. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Richards-Kortum; Follen.

**BIOE 420 BIOSYSTEMS TRANSPORT AND REACTION PROCESSES (3)**

The principles of reaction kinetics and transport phenomena will be used to quantitatively describe biological systems. Cell biology, physiology, anatomy, and materials science topics will be covered as background for the study of cell membrane transport, receptor-ligand interactions, and normal organ function. Models will be introduced to describe pathological conditions, drug pharmaco-kinetics, and artificial organ designs. Cross-listed with CHBE 420. Pre-requisite(s): MATH 211 and MATH 212. Offered Fall. Instructor(s): Deem.

**BIOE 425 PHARMACEUTICAL ENGINEERING (3)**

This course will examine how pharmaceutical active agents function in the body and how they are delivered to the body. Topics to be covered include the kinetics of drug absorption and tissue distribution along with the transport phenomena associated with the release bioactive agents. Focus will be placed on mathematical modeling of pharmacokinetic and diffusional processes. Graduate/Undergraduate version: BIOE 625. Pre-requisite(s): BIOE 391 or permission of instructor. Offered Spring. URL: [www.owl.net.rice.edu/~bioe425](http://www.owl.net.rice.edu/~bioe425).

**BIOE 440 STATISTICS FOR BIOENGINEERING (1)**

Course covers application of statistics to bioengineering. Topics include descriptive statistics, estimation, hypothesis testing, ANOVA, and regression. Offered first five weeks of the semester. Pre-requisite(s): CAAM 210. Offered Fall & Spring. Instructor(s): Saterbak (Spring), Diehl (Fall).

**BIOE 442 TISSUE ENGINEERING LAB MODULE (1)**

Students conduct a series of tests to synthesize PLLA, characterize PLLA and PLGA, monitor PLLA and PLGA degradation, and assess the viability, attachment, and proliferation of HDF cells on PLLA films. The experiments include many of the basic types of experiments that would be required to do a preliminary investigation of a tissue-engineered product. Sections 1 and 2 will be taught during the first half of the semester and sections 3 and 4 will be taught during the second half of the semester. In addition, sections 1 and 3 will need to come into lab on 2-3 Fridays and sections 2 and 4 will need to come into lab on 2-3 Saturdays. Section sign-up is required by the instructor in Keck 108 during preregistration week. Pre-requisite(s): BIOE 342. Limited enrollment. Offered Fall. Instructor(s): Saterbak.

**BIOE 443 BIOPROCESSING LAB MODULE (1)**

Students conduct a series of experiments to observe the growth of *E. coli* under different conditions, including agar platers, shake flasks, and a small-scale bioreactor. The *E. coli* has been transformed with a plasmid that produces beta-galactosidase. Some work "off hours" (early evening) is required. Sections 1 and 2 are taught in the first half of the semester and Sections 3 and 4 are taught in the second half of the semester. Section sign-up is required by the instructor in Keck 108 during preregistration week. Prerequisite(s): BIOE 342. Limited enrollment. Offered Fall. Instructor(s): Saterbak.



**BIOE 444 MECHANICAL TESTING LAB MODULE (1)**

Students conduct a series of tests to elucidate the mechanical and material properties of chicken bones, tendons, and skin using the Instron. Section sign-up is required by the instructor in Keck 108 during the preregistration week. Pre-requisite(s): BIOE 372. Instructor permission required. Limited enrollment. Offered Fall & Spring. Instructor(s): Oden.

**BIOE 445 ADVANCED INSTRUMENTATION LAB MODULE (1)**

Students design and build a biomedical instrumentation device. Sign up is required in Keck 108 during preregistration week. Pre-requisite(s): BIOE 383 and BIOE 385. Limited enrollment. Offered Fall. Instructor(s): Oden.

**BIOE 451 BIOENGINEERING DESIGN I (3)**

Senior Bioengineering students will design devices in biotechnology or biomedicine. This project-based course covers systematic design processes, engineering economics, FDA requirements, safety, engineering ethics, design failures, research design, intellectual property rights, business planning and marketing. Students will be expected to compile concise documentation and present orally progress of their teams. It is required that students take both parts of this course in the same year. BIOE 451 and 452 must be taken the same academic year. Pre-requisite(s): BIOE 252 and BIOE 372 and BIOE 383. Offered Fall. Instructor(s): Oden.

**BIOE 452 BIOENGINEERING DESIGN II (3)**

Senior Bioengineering students will design devices in biotechnology or biomedicine. This project-based course covers systematic design processes, engineering economics, FDA requirements, safety, engineering ethics, design failures, research design, intellectual property rights, business planning and marketing. Students will be expected to compile concise documentation and present orally progress of their teams. It is required that students take both parts of this course in the same school year. BIOE 451 and 452 must be taken the same academic year. Pre-requisite(s): BIOE 451. Offered Spring. Instructor(s): Oden.

**BIOE 454 COMPUTATIONAL FLUID MECHANICS (3)**

Fundamental concepts of finite element methods in fluid mechanics, including spatial discretization and numerical integration in multi-dimensions, time-integration, and solution of nonlinear ordinary differential equation systems. Advanced numerical stabilization techniques designed for fluid mechanics problems. Strategies for solution of complex, real-world problems. Topics in large-scale computing, parallel processing, and visualization. Cross-listed with CEVE 454, MECH 454. Graduate/Undergraduate version: BIOE 554. Offered Fall. URL: [www.mems.rice.edu/TAFSM/MECH454](http://www.mems.rice.edu/TAFSM/MECH454). Instructor(s): Tezduyar.

**BIOE 455 SYSTEMS BIOLOGY AND MOLECULAR DESIGN (3)**

This course portends to give a balanced view of current developments in integrative biology that may lead to future design concepts for the molecular therapy of malignancy. Instructor(s): Fernandez.

**BIOE 460 BIOCHEMICAL ENGINEERING (3)**

Design, operation, and analysis of processes in the biochemical industries. Topics include enzyme kinetics, cell growth kinetics, energetics, recombinant DNA technology, microbial, tissue and plant cell cultures, bioreactor design and operation, and down stream processing. Cross-listed with CHBE 460. Pre-requisite(s): BIOE 252 or permission of instructor. Offered alternate years. Instructor(s): San.

**BIOE 461 GLOBAL HEALTH DESIGN CHALLENGES I (2)**

Students in this course will work on design projects to address global health disparities. Students will work in teams and partner with bioengineering students to develop solutions to particular problems in delivering healthcare in the developing world. Students must take BIOE 462 in the spring semester to complete their projects. Pre-requisite(s): BIOE 260 and BIOE 301. Limited enrollment. Offered Fall. Instructor(s): Oden; Kortum.

**BIOE 462 GLOBAL HEALTH DESIGN CHALLENGES II (2)**

This is a continuation of BIOE 461. Students in this course will work on design projects to address global health disparities. Students will work in teams and partner with bioengineering students to develop solutions to particular problems in delivering healthcare in the developing world. Pre-requisite(s): BIOE 461. Limited enrollment. Offered Spring. Instructor(s): Oden; Kortum.

**BIOE 464 EXTRACELLULAR MATRIX (3)**

This course will address the biology, organization, mechanics, and turnover of extracellular matrix. There will be an emphasis on cells and cell-matrix interactions, matrix distributions in connective tissues and organs, techniques for measurement and modeling, changes with growth and aging, and tissue/matrix degradation. Cross-listed with BIOS 464. Pre-requisite(s): BIOE 372. Offered alternate years. Instructor(s): Grande-Allen.

**BIOE 470 FROM SEQUENCE TO STRUCTURE: AN INTRODUCTION TO COMPUTATIONAL BIOLOGY (4)**

This course is a modern introduction to problems in computational biology spanning sequence to structure. The course has three modules: the first introduces statistical techniques in sequence analysis; the second covers statistical machine learning techniques for understanding experimental data generated in computational biology; and the third introduces problems in the structure of complex biomolecules. Cross-listed with COMP 470, STAT 470. Offered Spring. Instructor(s): Kaviraki; Kimel; Subramanian.

**BIOE 471 INTRODUCTION TO FUNCTIONAL MRI (3)**

A comprehensive introduction to all aspects of functional magnetic resonance imaging, a cutting-edge methodology that allows direct observation of the neural processing underlying human perception and cognition. Lectures will cover methods and applications of fMRI. The lab portion will involve designing experimental paradigms and collecting and analyzing fMRI data. Class will be held at University of Texas Medical School Branch. Pre-requisite(s): BIOE 322. Offered Fall. Instructor(s): Beauchamp.

**BIOE 472 ADVANCED BIOMECHANICS (3)**

Mechanical properties of tissues; functional adaptation of biologic tissues; experimental methods for testing mechanical properties; anisotropic material properties; tensor analysis; multi-axial loading. Prerequisite(s): BIOE 372. Instructor permission required. Limited enrollment. Instructor(s): Liebschner.

**BIOE 474 EXPERIMENTAL TECHNIQUES IN BIOENGINEERING (3)**

Introduction to experimental techniques used in bioengineering to assess biomaterials and tissues. This course will primarily concentrate on basic concepts of measurement methods, experimental design, signal analysis, and the development of experimental protocols. In laboratory modules focusing on mechanical testing of non-Newtonian materials, parameter extraction out of signal data sets, and electronic circuits. The theoretical concepts covered in class will be implemented hands-on. Prerequisite(s): BIOE 372 or permission of instructor. Offered alternate years. Instructor(s): Liebschner.

**BIOE 481 COMPUTATIONAL NEUROSCIENCE (3)**

An introduction to anatomy and physiology of the brain. Development of models of neurons and natural neural networks. Cross-listed with ELEC 481. Instructor(s): Clark.

**BIOE 482 PHYSIOLOGICAL CONTROL SYSTEMS (4)**

Nervous system control of biological systems can be represented utilizing techniques common to the field of linear, nonlinear or adaptive control theory. This course begins with a review of the basic aspects of control theory, followed by detailed discussion of the structure of several biological systems including the visual, cardiovascular and pulmonary systems. Specific examples of neural control are developed for each system utilizing modeling and simulation techniques. Parameter sensitivity analysis and parameter estimation techniques are likewise brought to bear on some of these models to achieve good least-squares fits to experimental data. Cross-listed with ELEC 482. Instructor(s): Clark.

**BIOE 484 BIOPHOTONICS INSTRUMENTATION AND APPLICATIONS (3)**

Introduction to fundamentals of biophotonics instrumentation related to coherent light generation, transmission by optical components such as lenses and fibers, and modulation and detection. Interference and polarization concepts and light theories including ray and wave optics will be covered. Biomedical applications in optical sensing and diagnosis will be discussed. Pre-requisite(s): BIOE 383 or permission of instructor. Offered Fall. Instructor(s): Drezek.

**BIOE 485 FUNDAMENTALS OF MEDICAL IMAGING I (3)**

The course will introduce basic medical imaging modalities, such as x-ray, CT, and MRI, used to identify the anatomy of human organs, as well as other modalities, such as PET, SPECT, fMRI, and MEG, specifically developed to localize brain function. The course includes visits to clinical sites. Cross-listed with COMP 485, ELEC 485. Graduate/Undergraduate version: BIOE 685. Offered Fall. Instructor(s): Mawlawi.

**BIOE 486 FUNDAMENTALS OF MEDICAL IMAGING II (3)**

This course is directed towards graduate and senior undergraduate students interested in acquiring an in depth knowledge of Positron Emission Tomography (PET). The course will focus on PET physical principles, image formation, and processing. The course will also cover the various correction techniques used to quantify PET images as well as lay the foundations for understanding tracer kinetic modeling. A field trip to MD Anderson's PET facility will be organized to provide the students with hands on experience of PET imaging and data analysis. The use of PET imaging in various medical applications will also be covered. Cross-listed with COMP 486, ELEC 486. Instructor(s): Mawlawi.

**BIOE 492 SENSORY NEUROENGINEERING (3)**

This course will explore how bioengineering techniques and principles are applied to understand and model sensory systems, with a focus on the auditory, vestibular, and visual systems. The interaction between the electrical, mechanical and optical aspects of these systems, and ways to modulate these interactions, will be explored. The course will also cover the design of current auditory, visual and somatosensory neuroprosthetics (i.e. cochlear implants, retinal implants and brain-machine interfaces), as well as emerging technologies for neural stimulation. Graduate/Undergraduate version: BIOE 592. Prerequisite(s): BIOE 332 and BIOE 384 or permission of instructor. Limited enrollment. Offered alternate years. Instructor(s): Raphael.

**BIOE 500 GRADUATE RESEARCH (1 TO 15)**

Repeatable for Credit.

**BIOE 501 GRADUATE RESEARCH (1 TO 15)**

Only first semester graduate students are eligible to take this course. Offered Fall.

**BIOE 505 OPTICAL IMAGING (3)**

This course includes a theoretical portion, which will introduce the fundamentals of optical imaging of neural activity, including the devices that are employed, and review applications and discuss their results. In addition, in a practical part, students will design, set up, and perform simple in vitro experiments to gain practical experience with this exciting and powerful technology. Course meets in S744, Vivian Smith Res. Bldg., Baylor College of Medicine Instructor(s): Saggau.

**BIOE 515 SYSTEMS BIOLOGY AND MOLECULAR DESIGN (3)**

The course introduces systems biology concepts and their bearing on molecular design. The course portends to present a balanced and integrative outlook at the various molecular components that determine biological function, sub-cellular organization and dysfunction. The focus is placed on the molecular aspects and design principles governing protein interactivity, supra-molecular organization and interactome modularity. Practical applications will be delineated; in particular, those pertaining to the development of systems-based design principles to avert side effects in drug therapy. Pre-requisite(s): BIOS 301 or BIOS 201 or BIOS 551 or CHEM 311 or permission of instructor. Offered alternate years. Instructor(s): Fernandez.

**BIOE 520 BIOSYSTEMS TRANSPORT PHENOMENA (3)**

The principles of transport phenomena will be used to quantitatively describe biological systems. Offered Spring. Instructor(s): Deem.

**BIOE 522 GENE THERAPY (3)**

This course will examine the gene therapy field, with topics ranging from gene delivery vectors to current human clinical trials. The design principles for engineering improved gene delivery vectors, both viral and nonviral, will be discussed. Current disease-specific applications of gene therapy in animal models and humans will be presented. Must be in one of the following Classification(s): Senior. Must be enrolled in one of the following Level(s): Graduate. Pre-requisite(s): CHEM 212 and BIOS 201 or permission of instructor. Offered Fall. Instructor(s): Suh.

**BIOE 531 BIOMATERIALS ENGINEERING (3)**

Emphasis will be placed on issues regarding design and synthesis of materials to achieve specific properties and biocompatibility. An overview of significant biomaterials application will be given, including topics such as ophthalmic biomaterials, orthopedic applications, cardiovascular biomaterials, and drug delivery systems. Regulatory issues concerning biomaterials will also be addressed. Recommended prerequisite(s): CHEM 211 and BIOS 201. Offered Fall. Instructor(s): West.

**BIOE 540 INTRODUCTION TO SYSTEMS BIOLOGY AND SYSTEMS BIOTECHNOLOGY (3)**

Systems biology is an integrated experimental and mathematical approach to study the complex dynamic interactions between various components of a biological system. The course is designed to explore the basic concepts of systems biology. The course will introduce "systems" approaches based on genomics, transcriptomics, proteomics and metabolomics. Offered alternate years. Instructor(s): San.

**BIOE 541 DESIGN AND ANALYSIS OF EXPERIMENTS (3)**

Introduction to methods and concepts of statistical analysis, analysis of variance, full and fractional designs at two and three levels, orthogonal arrays, response surface methodology. Offered Fall. Instructor(s): San.

**BIOE 542 SUPRAMOLECULAR BIOPHYSICS AND BIOENGINEERING (3)**

Multi-component complexes of biological macromolecules form the basis of many cellular processes including signaling, metabolism, and bimolecular transport. This course will examine the impact of supramolecular architecture on these processes by discussing the self-assembly, dynamic properties and physiological function of non-covalently coupled macromolecules and interacting proteins. The course will cover fundamental models of protein-protein interactions, cooperativity, instrumentation, and potential technological applications. Offered alternate years. Instructor(s): Diehl.

**BIOE 551 INTRODUCTION TO BIOENGINEERING (1)**

Seminar/tutorial introducing current research in bioengineering and biotechnology to acquaint students with activities of various labs at Rice and the Texas Medical Center. Cross-listed with CHBE 551. Must be enrolled in one of the following Level(s): Graduate. Recommended prerequisite(s): Graduate standing or permission of instructor. Offered Fall. Instructor(s): Tran.

**BIOE 552 EVOLUTIONARY DESIGN PRINCIPLE OF BIOMECHANICAL NETWORKS (3)**

The course summarizes techniques for analysis and simulations of basic circuits in genetic regulation, signal transduction and metabolism and aims to formulate evolutionary design principles explaining organization of networks in terms of their physiological demands. Topics include end-product inhibition in biosynthesis, robustness of the signaling networks and kinetic proofreading. Instructor(s): Igoshin.

**BIOE 554 COMPUTATIONAL FLUID MECHANICS (3)**

Graduate version of BIOE 454. Additional work required. Cross-listed with CEVE 554, MECH 554. Graduate/Undergraduate version: BIOE 454. Offered Fall. URL: [www.mems.rice.edu/TAFSM/MECH454](http://www.mems.rice.edu/TAFSM/MECH454). Instructor(s): Tezduyar.

**BIOE 572 FUNDAMENTALS OF SYSTEMS PHYSIOLOGY (3)**

This course will teach the fundamentals of physiology at the organism, tissue, and cellular levels. Emphasis will be on engineering aspects of physiology. Pre-requisite(s): BIOE 322. Offered Spring. Instructor(s): Drezek.

**BIOE 575 CONTINUUM BIOMECHANICS (3)**

Graduate level introduction to continuum mechanics. The course covers important concepts in tensor calculus, kinematics and strain, stress and constitutive theories of continua, including elasticity, Newtonian fluids, viscoelasticity, and mixture theory. Selective topics in bone, articular cartilage, circulation and cell biomechanics will be discussed to illustrate the application of continuum mechanics to bioengineering problems. Must be enrolled in one of the following Level(s): Graduate. Pre-requisite(s): BIOE 372 or permission of instructor. Instructor(s): Athanasiou.

**BIOE 576 FOUNDATIONS OF BIOTECHNOLOGY (1)**

Graduate level introduction to a wide range of research methods in biosciences and bioengineering. Individual faculty members from the Biosciences and Bioengineering will each present practices and techniques for their areas of expertise. A web-based methods database will be constructed, with student involvement, from the library of lectures. Cross-listed with BIOS 576. Must be enrolled in one of the following Level(s): Graduate.

**BIOE 577 FOUNDATIONS OF BIOTECHNOLOGY (1)**

Graduate level introduction to a wide range of research methods in biosciences and bioengineering. Individual faculty members from the biosciences and bioengineering will each present practices and techniques for their areas of expertise. A web-based methods database will be constructed, with student involvement, from the library of lectures. Cross-listed with BIOS 577. Must be enrolled in one of the following Level(s): Graduate. Instructor(s): Cates.

**BIOE 578 BIOTECHNOLOGY PRACTICUM (1)**

This course is part of the NIH Biotechnology Training Program and is limited to program participants. Students will receive exposure and training in cutting edge concepts and technologies.

**BIOE 581 CARDIOVASCULAR DYNAMICS (3)**

Mathematical modeling of the cardiovascular and respiratory systems, and their neural control. Integration of these system models into a human cardiopulmonary model capable of stimulating measured data from functional tests. Cross-listed with ELEC 581. Pre-requisite(s): ELEC 481 and ELEC 482 and ELEC 507. Repeatable for Credit. Instructor(s): Clark.

**BIOE 585 TRANSLATIONAL BIOENGINEERING SEMINAR (1.5)**

A seminar series focused on translational research opportunities to be held each semester. Each seminar will be jointly presented by a clinical faculty member, a basic science faculty member, and bioengineering faculty member to integrate focused discussion of clinical cancer needs, advances in cancer biology, and new diagnostic and therapeutic technologies, which build on these advances to meet clinical needs. Seminars held at MDACC. Offered Spring. Instructor(s): Gillenwater.

**BIOE 589 COMPUTATIONAL MOLECULAR BIOENGINEERING/BIOPHYSICS (3)**

This is a course designed for students in computationally oriented biomedical and bioengineering majors to introduce the principles and methods used for the simulations and modeling of macromolecules of biological interest. Protein conformation and dynamics are emphasized. Empirical energy function and molecular dynamics calculations are described. Specific biological problems are discussed to illustrate the methodology. Classic examples such as the cooperative mechanism of hemoglobin and more frontier topics such as the motional properties of molecular motors and ion channels as well as results derived from the current literature are covered. Cross-listed with BIOS 589. Recommended prerequisite(s): MATH 212, BIOS 301, BIOE 332. Instructor(s): Ma.

**BIOE 592 SENSORY NEUROENGINEERING (3)**

This course will explore how bioengineering techniques and principles are applied to understand and model sensory systems, with a focus on the auditory, vestibular, and visual systems. The interaction between the electrical, mechanical and optical aspects of these systems, and ways to modulate these interactions, will be explored. The course will also cover the design of current auditory, visual and somatosensory neuroprosthetics (i.e. cochlear-implants, retinal implants and brain-machine interfaces), as well as emerging technologies for neural stimulation. Graduate/Undergraduate version: BIOE 492. Offered alternate years. Instructor(s): Raphael.

**BIOE 594 TRAINING IN THE RESPONSIBLE CONDUCT OF RESEARCH (1)**

This course will consider ethical issues involving human and animal subjects, record keeping, publications, potential conflict of interest, and behavior toward colleagues, research fellows, students, and employees. Cross-listed with BIOS 594. Must be enrolled in one of the following Level(s): Graduate. Limited enrollment.

**BIOE 610 METHODS OF MOLECULAR SIMULATION (3)**

Modern simulation techniques for classical atomistic systems. Review of statistical mechanical systems. Monte Carlo and molecular dynamics simulation techniques. Extensions of the basic methods to various ensembles. Applications to simulations of large molecules such as proteins. Advanced techniques for simulation of complex systems, including constraint satisfaction, cluster moves, biased sampling, and random energy models. Cross-listed with PHYS 610. Pre-requisite(s): CHBE 611 or BIOE 589 or BIOS 589 or CHEM 520 or PHYS 526 or permission of instructor. Offered alternate years. Instructor(s): Deem.

**BIOE 615 BIOENGINEERING AND CARDIAC SURGERY (3)**

This course will address biomaterials and medical devices relevant to cardiac and vascular surgery and interventional cardiology in adult and pediatric patients. Mechanical and design considerations, notable successes and failures, and ethical issues will also be discussed, as will differences in cardiac disease and care due to health disparities. Offered alternate years. Instructor(s): Grande-Allen.

**BIOE 620 TISSUE ENGINEERING (3)**

Study of cell-cell interactions and the role of the extracellular matrix in the structure and function of normal and pathological tissues. Includes strategies to regenerate metabolic organs and repair structural tissues, as well as cell-based therapies to deliver proteins and other therapeutic drugs, with emphasis on issues related to cell and tissue transplantation such as substrate properties, angiogenesis, growth stimulation, cell differentiation, and immunoprotection. Cross-listed with CHBE 620. Offered Spring. Instructor(s): Mikos.

**BIOE 625 PHARMACEUTICAL ENGINEERING (3)**

This course will examine how pharmaceutical active agents function in the body and how they are delivered to the body. Topics to be covered include the kinetics of drug absorption and tissue distribution along with the transport phenomena associated with the release bioactive agents. Focus will be placed on mathematical modeling of pharmacokinetic and diffusional processes along with the critical evaluation of peer reviewed journal articles on biopharmaceuticals. Graduate/Undergraduate version: BIOE 425. Must be enrolled in one of the following Level(s): Graduate. Offered Spring.

**BIOE 633 LIFE SCIENCE ENTREPRENEURSHIP AND THE ROLES OF FOUNDERS AND VENTURE CAPITAL ON HIGH TECH STARTUP (1.5)**

The major trends and innovations driving the creation of new products in large established companies and venture-capital-backed startup companies are discussed. This pragmatic, experienced-based course describes the venture capital process, formation, and capitalization of high-tech companies, sources of technologies, role of tech transfer at universities and medical schools, startup operational issues, role of VCs and board members, execution time frames, liquidity process, IPOs and mergers, and payout prospects for founders and inventors. Repeatable for Credit. Offered Spring.

**BIOE 643 MECHANICAL AND THERMODYNAMIC PROPERTIES OF BIOMEMBRANES. (3)**

The mechanical properties of membranes influence several biological processes including endocytosis, fusion, signaling and cellular differentiation. This course will cover the theoretical foundations of membrane mechanics, examine experimental methods for measuring membrane material properties, including nanomechanical and optical techniques, and emphasize the importance of membrane mechanics in bioengineering applications. Instructor permission required. Instructor(s): Raphael.

**BIOE 654 ADVANCED COMPUTATIONAL MECHANICS (3)**

Advanced topics in computational mechanics with emphasis on finite element methods and fluid mechanics. Stabilized formulations. Fluid-particle and fluid-structure interactions and free surface and two-fluid flows. Interface tracking and interface-capturing techniques, space-time formulations, and mesh update methods. Enhanced discretization and solution techniques. Iterative solution methods, matrix-free computations, and advanced preconditioning techniques. Cross-listed with CEVE 654, MECH 654. Prerequisite(s): BIOE 654 or permission of instructor. Offered Spring. Instructor(s): Tezduyar.

**BIOE 661 ONCOLOGY FOR BIOENGINEERS: MOLECULES TO ORGANS (3)**

This new course will provide an overview cancer terminology, and concepts in epidemiology, anatomy pathology, and pathophysiology of cancers of the major organ systems. The novel feature of this course is that it will describe anatomic structure and cancer pathology across a range of physical scales, ranging from the molecular to the cellular to the organ to integrated organ systems. In addition, the course has a patient-oriented focus: students have the opportunity to visit with patients and interview them about their signs and symptoms, their diagnosis and treatment and their experiences in the health care system. These interviews guide focused student course projects to learn more about cancer prevention, diagnosis and treatment. Required: Admission to Med Into Grad Program. Offered Spring. Instructor(s): Peek.

**BIOE 662 NEW TECHNIQUES FOR CANCER DIAGNOSIS (1)**

This course will provide an overview of promising cancer-related biomarkers, and biomarker identification techniques, molecular targeting technologies, sensing and transducing technologies, and imaging technologies. Prerequisites: Admission to BIOE Graduate Program. Must be in one of the following Classification(s): Graduate. Instructor permission required.

**BIOE 684 ADVANCED BIOPHOTONICS (3)**

This advanced topics course focuses on novel technologies for optical spectroscopy, microscopy, and in vivo imaging with an emphasis on applications in clinical medicine. Previous course work in optics is required. Graduate/Undergraduate version: BIOE 384. Offered alternate years. Instructor(s): Drezek.

**BIOE 698 GRADUATE SEMINAR (1)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit.

**BIOE 699 GRADUATE SEMINAR (1)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit.

**BIOS (BIOSCIENCES)****School of Natural Sciences/Biosciences****BIOS 113 ENVIRONMENTAL CRISIS SEMINAR (1)**

Seminar topics may vary.

**BIOS 115 FRESHMAN SEMINAR ON LOCAL BIOLOGY RESEARCH (1)**

A 5-week seminar course to introduce freshmen prospective biologists to the excitement of research at Rice and the Medical Center and to provide context with which to think about facts presented in biosciences textbooks. Small groups will meet weekly with a graduate student or postdoctoral researcher to explore a published research article by a local lab, gaining background information about the subject and exposure to the research techniques. In the final session, the group will tour the lab that produced the featured article. Additional tours and activities TBA. All first-year students are eligible to enroll in BIOS 115 regardless of AP credit. This course meets in the second half of the semester. Limited enrollment. Offered Fall & Spring. Instructor(s): Bartel; Phillips.

**BIOS 122 FUNDAMENTAL CONCEPTS IN BIOLOGY (3)**

Biological topics of current interest, covering advances in biotechnology, human health, agriculture, and the environment. Topics focus on the underlying biology, but may also include the social/political/economic impact. Each session is taught by an expert in that field with the assistance of a class coordinator. Offered Fall.

**BIOS 201 INTRODUCTORY BIOLOGY (3)**

The first in an integrated sequence of four courses (BIOS 201, 202, 301, 302). Chemistry and energetics, cell physiology, cell biology, Mendelian genetics, molecular genetics, developmental biology, and plant physiology. Offered Fall. Instructor(s): Gustin; Wagner.

**BIOS 202 INTRODUCTORY BIOLOGY (3)**

The second in an integrated sequence of four courses (BIOS 201, 202, 301, 302). Molecular genetics, DNA technology, antibiotics and antivirals, animal behavior, evolution, ecology, diversity, and conservation biology. Pre-requisite(s): BIOS 201. Offered Spring. URL: [www.owlnet.rice.edu/~bios202/](http://www.owlnet.rice.edu/~bios202/). Instructor(s): Meffert.

**BIOS 211 INTRODUCTION TO EXPERIMENTAL BIOSCIENCES (2)**

Introduction to "laboratory math," record keeping, technical communication, selected research strategies, and methods of science, in a biological context. Taught in the first half of each semester. \*\*\* Special Registration Instructions: To register, go to the course URL, select "Getting Started" then "Register" and follow instructions from there. Pre-requisite(s): BIOS 201. Instructor permission required. \*\*\*SPECIAL REGISTRATION REQUIRED\*\*\* The course is available but is closed to registration through ESTHER. To register, go to the course URL, select "Getting started" then "Register" and follow instructions from there. Offered Fall & Spring. URL: [www.ruf.rice.edu/~bioslabs/bios211/](http://www.ruf.rice.edu/~bioslabs/bios211/). Instructor(s): Caprette.

**BIOS 213 INTRO LAB MOD ECOLOGY AND EVOLUTIONARY BIOLOGY (1)**

Experimental, laboratory, and field studies of natural history, ecology, evolution, and animal behavior. Computer simulations of population genetics. Course will begin after mid-semester break in the Fall semester and after mid-term recess in the Spring semester. Offered Fall & Spring. Instructor(s): Sullender.

**BIOS 301 BIOCHEMISTRY (3)**

The third in an integrated sequence of four courses (BIOS 201, 202, 301, 302). Structure and function of proteins, enzymes, and nucleic acids; enzyme kinetics; glycolysis, aerobic metabolism, and energy coupling. Pre-requisite(s): CHEM 211. Recommended prerequisite(s): CHEM 212. Offered Fall. Instructor(s): Shamoo; Rogge.

**BIOS 302 BIOCHEMISTRY (3)**

The final in an integrated sequence of four courses (BIOS 201, 202, 301, 302). Introduction to metabolism, membranes, electron transport, oxidative phosphorylation, and regulation. Biosciences Group A. Pre-requisite(s): BIOS 301 and CHEM 211. Recommended prerequisite(s): CHEM 212. Offered Spring. Instructor(s): MacKenzie; Shamoo.

**BIOS 306 INDEPENDENT STUDY FOR ECOLOGY & EVOLUTIONARY BIOLOGY UNDERGRADUATES (1 TO 4)**

Program of independent study for students with previous training in the biosciences. Includes a research paper. Students are expected to spend at least three hours per week in the laboratory for each semester hour of credit. If taken for two or more hours, counts as one required lab course but not as a Group A or Group B course. If receiving two or more credits, students will be required to participate in the university annual undergraduate symposium in the spring semesters. Biosciences Group B. Pre-requisite(s): BIOS 211. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Strassmann.

**BIOS 307 GENETICS: SCIENCE AND SOCIETY (3)**

The course uses an interdisciplinary perspective. The course will cover biological basics of genes, DNA, and sequencing techniques; cultural and historical aspects to genetics, including essentialism and eugenics and policy issues. Cross-listed with ANTH 314. May not be in any of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): McIntosh; Novotny.

**BIOS 308 ADVANCED MODULES IN PLANT BIOCHEMISTRY (1)**

Bioorganic lab module combining molecular biology to express plant terpene synthases in microbial systems with product structural analysis using GC-MS and NMR. Final lab reports will be in the format of a scientific publication. Pre-requisite(s): CHEM 211 or BIOS 311. Instructor permission required. Offered Spring.

**BIOS 309 SEMINAR IN RESEARCH METHODOLOGY (2)**

A course based on laboratory research done outside the university, which will use seminars, discussion and papers to develop communication skills in research. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Bennett.

**BIOS 310 INDEPENDENT STUDY FOR BIOCHEMISTRY AND CELL BIOLOGY UNDERGRADUATES (1 TO 4)**

Section 1 is Biochemistry and Cell Biology. Program of independent study for students with previous training in the biosciences. Includes a research paper. Students are expected to spend at least three hours per week in the laboratory for each semester hour of credit. If taken for 2 or more hours, counts as one required lab course but not as a Group A or Group B course. If receiving 2 or more credits, students will be required to participate in the university annual undergraduate symposium in the spring semester. Biosciences Group B. Pre-requisite(s): BIOS 211. Department permission required. Recommended: Instructor permission. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Bennett.

**BIOS 311 ADVANCED EXPERIMENTAL BIOSCIENCES (1)**

Advancement of basic laboratory, record keeping, and technical communication skills. Taught first half of each semester. NOTICE: The course is closed to registration on Esther. To register, you must obtain the instructor's signature on a Special Registration form available from the Office of the Registrar. Prerequisite(s): BIOS 211 and BIOS 301. Instructor permission required. Limited enrollment. Offered Fall & Spring. Instructor(s): Beason.

**BIOS 312 EXPERIMENTAL MOLECULAR BIOLOGY (1)**

Introduction to strategies in molecular biology and experience in preparation of a scientific poster. Taught first half of spring or second half of fall semester. NOTICE: The course is closed to registration on Esther; to register, you must get the instructor's signature on a Special Registration form available from the Office of the Registrar. Pre-requisite(s): BIOS 311. Instructor permission required. Limited enrollment. Offered Fall & Spring. Instructor(s): Beason.

**BIOS 313 ADVANCED EXPERIMENTAL MOLECULAR BIOLOGY (1)**

Team projects using microarrays to analyze gene expression; teams give a PowerPoint presentation to communicate their findings. Taught second half of spring semester. NOTICE: the course is closed to registration on Esther. To register, you must obtain the instructor's signature on a Special Registration form available from the Office of the Registrar. Pre-requisite(s): BIOS 311 and BIOS 312 and BIOS 311. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Beason.

**BIOS 314 EXPERIMENTAL CELL BIOLOGY (1)**

Application of transmission electron microscopy to research in cell biology. Students will interview a faculty investigator and conduct an original research project. Recommended for students interested in a research career. Pre-requisite(s): BIOS 301 and BIOS 311 and BIOS 341. Instructor permission required. Limited enrollment. Not offered this academic year. Instructor(s): Caprette.

**BIOS 315 EXPERIMENTAL PHYSIOLOGY (1)**

An instrumentation-intensive short course in membrane electrophysiology and vertebrate nerve and muscle physiology. Research reports require interpretation of laboratory data in terms of concepts at the molecular level. Starts the second half of the semester. Pre-requisite(s): BIOS 301 and BIOS 311. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~bioslabs/bios315/](http://www.ruf.rice.edu/~bioslabs/bios315/). Instructor(s): Caprette.

**BIOS 316 LAB MODULE IN ECOLOGY (1)**

Field and lab experiments in ecology. Pre-requisite(s): BIOS 323 or BIOS 325 or permission of instructor. Limited enrollment. Offered Fall. URL: [www.owl.net.rice.edu/~bios316](http://www.owl.net.rice.edu/~bios316). Instructor(s): Siemann.

**BIOS 317 LAB MODULE IN BEHAVIOR (1)**

Field experiments in behavior. Learn to formulate and test hypotheses on bird behavior using mockingbirds, grackles, and herons nesting on campus. Pre-requisite(s): BIOS 321 and BIOS 213. Instructor permission required. Offered Spring. URL: [https://owlspacemcrrice.edu/access/content/group/BIOS-317-001-sp07/public\\_html/index.html](https://owlspacemcrrice.edu/access/content/group/BIOS-317-001-sp07/public_html/index.html). Instructor(s): Strassmann.

**BIOS 318 LABORATORY STUDIES IN APPLIED MICROBIOLOGY (1)**

Microbiological analysis of water, isolation, culture, observation, assay, and identification of bacteria, in the context of a simulated internship with a water/public health department. Starts the second half of the semester, self-scheduled after the first four formal meetings. Requires daily attention to cultures during the week. Pre-requisite(s): BIOS 311. Limited enrollment. Offered Fall. URL: [www.ruf.rice.edu/~bioslabs/bios318/](http://www.ruf.rice.edu/~bioslabs/bios318/). Instructor(s): Caprette.

**BIOS 320 LAB MODULE IN TISSUE CULTURE (1)**

Introduction to tissue culture techniques, including cell passage, cell attachment and proliferation assays, and a transfection assay. Sections 1 and 2 are taught during the first half of the semester. Sections 3 and 4 are taught during the second half of the semester. Your registration for this course will not be accepted until you obtain Dr. Saterbak's signature on an Undergraduate Special Registration Request Form. Cross-listed with BIOE 342. Pre-requisite(s): BIOS 211 or CHEM 214. Instructor permission required. Offered Spring. Instructor(s): Saterbak.

**BIOS 321 ANIMAL BEHAVIOR (3)**

Evolutionary theory is used to evaluate behavioral adaptations of organisms to their environment. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 or BIOS 202 or BIOS 201. Offered Fall. URL: [www.owl.net.rice.edu/~bios321/](http://www.owl.net.rice.edu/~bios321/) Instructor(s): Strassman.

**BIOS 323 CONSERVATION BIOLOGY (3)**

The course is designed to give students a broad overview of conservation biology. Lecture and discussions will focus on conservation issues such as biodiversity, extinction, management, sustained yield, invasive species and preserve design. Group B Biosciences Group B. Cross-listed with ENST 323. Pre-requisite(s): BIOS 201 and BIOS 202 or permission of instructor. Offered Spring. URL: [www.owl.net.rice.edu/~bios323/](http://www.owl.net.rice.edu/~bios323/).

**BIOS 325 ECOLOGY (3)**

Study of population dynamics, species interactions, plant and animal community organization, and ecosystem function. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 and BIOS 202 or permission of instructor. Offered Fall. URL: [www.owl.net.rice.edu/~bios325/](http://www.owl.net.rice.edu/~bios325/). Instructor(s): Holland.

**BIOS 326 INSECT BIOLOGY (3)**

This course addresses contemporary issues in ecology and evolution through the lens of insect diversity. Laboratory and field exercises provide hands-on experience with collection and curation of insect specimens. Readings span a broad literature (popular to technical). Writing and oral reports develop proficiency in scientific communication. 1 credit lab is required (BIOS 330). Group B Biosciences Group B. Pre-requisite(s): BIOS 201 and BIOS 202 or permission of instructor. Corequisite(s): BIOS 330 or permission of instructor. Offered Spring. Instructor(s): Rudgers.

**BIOS 327 BIOLOGICAL DIVERSITY LABORATORY (1)**

The course will examine (1) measures of biological diversity (taxic, molecular, and phylogenetic); (2) the ecological and evolutionary causes of biological diversity; (3) issues regarding the contribution of biological diversity to ecosystem function. A primary emphasis will be placed on experimental design and the measurement and estimation of biological diversity. Possible problems associated with the measurement and estimation of biological diversity will also be discussed. The course will take form of weekly preparatory meetings and culminate in a three-day exercise (taking place over fall break) at a field site in Texas where student will be responsible for designing and carrying out a study examining some aspect of biological diversity (taxic or functional group) with respect to such variables as habitat diversity, disturbance rate, or productivity. The course will emphasize oral presentations and written "publication" format papers. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 213. Offered Fall & Spring. Instructor(s): Sullender.

**BIOS 328 EVOLUTION OF GENES AND GENOMES (3)**

The course provides an overview of the evolution of genes and genomes. Using many examples, the course introduces databases and the Worldwide Web, and molecular and statistical methods used to study the evolution of genes and genomes. Broad-scale evolutionary patterns and medical applications based on genome analyses are presented. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 and BIOS 202. Limited enrollment. Offered Spring. URL: [www.owl.net.rice.edu/~bios328/syllabus\\_ss06.htm](http://www.owl.net.rice.edu/~bios328/syllabus_ss06.htm).

**BIOS 329 ANIMAL BIOLOGY AND PHYSIOLOGY (3)**

The evolution and systematics of the animal kingdom with consideration of functional anatomy, comparative physiology, behavior, medical implications and resource management. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 or BIOS 202 or permission of instructor. Offered Fall. Instructor(s): Fisher.

**BIOS 330 INSECT BIOLOGY LAB (1)**

Required lab for BIOS 326. Pre-requisite(s): BIOS 201 and BIOS 202 or permission of instructor. Corequisite(s): BIOS 326 or permission of instructor. Offered Spring. Instructor(s): Rudgers.

**BIOS 332 FUNDAMENTALS OF SYSTEMS PHYSIOLOGY (3)**

This course will teach the fundamentals of physiology at the organism, tissue, and cellular levels. Emphasis will be on engineering aspects of physiology. This course includes several projects and written assignments. Biosciences Group A. Cross-listed with BIOE 322. Pre-requisite(s): BIOS 201 and MATH 211. Offered Spring.

**BIOS 334 EVOLUTION (3)**

Principles of biological evolution. Topics include natural selection, adaptation, molecular evolution, formation of new species, the fossil record, biogeography, and principles of classification. Group B Biosciences Group B. Pre-requisite(s): BIOS 202 or permission of instructor. Offered Fall. URL: [www.ruf.rice.edu/~queller/BIOS334/](http://www.ruf.rice.edu/~queller/BIOS334/). Instructor(s): Queller.

**BIOS 336 PLANT DIVERSITY (3)**

The evolution, systematics, and ecology of plants, with emphasis on flowering plants and biodiversity. Group B Biosciences Group B. Pre-requisite(s): BIOS 202. Limited enrollment. Offered Spring. URL: [www.owl.net.rice.edu/~bios336/](http://www.owl.net.rice.edu/~bios336/). Instructor(s): Whitney.



**BIOS 337 FIELD BIRD BIOLOGY LAB (1)**

This course centers on a series of five field trips to diverse habitats for observing birds both immigrants and residents. Each will be preceded by a lecture and students will do two projects. Limited enrollment. URL: [www.owlnet.rice.edu/~bios337/](http://www.owlnet.rice.edu/~bios337/). Instructor(s): Lee; Queller; Strassmann.

**BIOS 338 DESIGN AND ANALYSIS OF BIOLOGICAL EXPERIMENTS (3)**

This course will address methods to set up biological experiments in order to maximize the ability to draw meaningful statistical conclusions. We will discuss factorial, nested, split-plot, and repeated-measures designs, as well as analysis of the data and interpretation of the results. The course also includes analysis of undesigned (observational) data sets. The course is not an introduction to statistics, but it will include a brief review of basic statistics. An interactive statistical-software package will be used throughout for class demos, homework assignments, and a class project. Data sets from many areas of biology will be used. Limited enrollment. Offered Fall. Instructor(s): Jones.

**BIOS 339 BIOMETRY (3)**

This course provides advanced training in statistical analysis in ecology and evolutionary biology. Working with real data sets, we will explore diverse topics including breeding designs and quantitative genetics analysis, multiple regression, path analysis, structural equation modeling, bootstrapping and randomization tests, and nonmetric multidimensional scaling. Biosciences Group B. Pre-requisite(s): STAT 280 or STAT 305 or ESCI 451 or BIOS 338. Offered alternate years. Instructor(s): Rudgers.

**BIOS 340 GLOBAL BIOGEOCHEMICAL CYCLES (3)**

This course introduces students to the coupled nature of the biosphere, atmosphere and hydrosphere using as focal points elemental cycles such as those of carbon and nitrogen. Biosciences Group B. Cross-listed with ENST 340, ESCI 340. Limited enrollment. Offered Fall. Instructor(s): Masiello.

**BIOS 341 CELL BIOLOGY (3)**

Molecular mechanisms of the processes common to all cells, including exposition of structure, function, and biogenesis of all subcellular organelles. Emphasis will be on cytoplasmic events; molecular studies of transcription will be taught in BIOS 344. Group A Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202. Offered Fall. Instructor(s): McNew; Braam.

**BIOS 344 MOLECULAR BIOLOGY AND GENETICS (3)**

Mendelian genetics, population genetics, mapping, gene expression and regulation, genetic engineering, DNA replication and recombination, human genetics, genetic disease and gene therapy. Biosciences Group A. Recommended Prerequisite(s): BIOS 201 and BIOS 202. Offered Spring. Instructor(s): Stewart.

**BIOS 352 PHYSICAL CHEMISTRY FOR THE BIOSCIENCES (3)**

Study of selected aspects of physical chemistry as it relates to the biosciences. Includes thermodynamics, reaction rate theory, quantum mechanics, and atomic and molecular structure. Biosciences Group A. Pre-requisite(s): CHEM 211 and CHEM 212 and PHYS 125 and PHYS 126 and BIOS 301. Offered Spring. Instructor(s): MacKenzie; Silberg.

**BIOS 361 METABOLIC ENGINEERING FOR GLOBAL HEALTH ENVIRONMENTS (3)**

Importance of nutritional and pharmaceutical compounds, impact of cost of compounds on global health; Overview of biochemical pathways; Genetic engineering and molecular biology tools for ME; Nutritional molecules; Pharmaceuticals (antibiotics, tamiflu-against influenza virus; anti-parasite compounds against malaria and filaria diseases; anti-diarrhea treatments). Pre-requisite(s): BIOE 260 and PHYS 126 and MATH 102. Offered Spring. Instructor(s): Bennett.

**BIOS 362 BIOENGINEERING FOR GLOBAL HEALTH ENVIRONMENTS (3)**

Clinical trial design, regulation of medical technologies, medical technology assessment. Detailed case studies of vaccine development, diagnostic tests, cancer screening. Pre-requisite(s): BIOE 260 and PHYS 126 and MATH 102. Offered Spring. URL: [www.owlnet.rice.edu/~BIOE362](http://www.owlnet.rice.edu/~BIOE362). Instructor(s): Richards-Kortum.

**BIOS 390 TRANSFER CREDIT IN BIOCHEMISTRY AND CELL BIOLOGY (3)**

For transfer of courses which have no current equivalent in the Rice curriculum, but which can be counted as Group A Biosciences courses in satisfying requirements for majors in Biosciences. Biosciences Group A. Repeatable for Credit.

**BIOS 391 TRANSFER CREDIT IN ECOLOGY AND EVOLUTIONARY BIOLOGY (3)**

For transfer of courses which have no current equivalent in the Rice curriculum, but which can be counted as Group B Biosciences courses in satisfying requirements for majors in the Biosciences. Biosciences Group B. Repeatable for Credit.

**BIOS 393 LABORATORY TRANSFER CREDIT IN BIOSCIENCES (1)**

For transfer of an advanced laboratory course in the biosciences that has no current equivalent in the Rice Biosciences curriculum. Any student may receive a maximum of 1 credit of BIOS 393.

**BIOS 401 UNDERGRADUATE HONORS RESEARCH (5)**

Open only to undergraduate majors who meet specific requirements and with the permission of the research supervisor and chair. Registration for BIOS 401 implies a commitment to participate in research for at least 2 semesters. A substantial written report of the research work is required. A substantial written report of the research work is required. For those taking 401 and 402 in the same academic year, the student thesis report is due at the end of the second term, the spring BIOS 402 term. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301. Department permission required. Repeatable for Credit. Offered Fall. Instructor(s): Bennett.

**BIOS 402 UNDERGRADUATE HONORS RESEARCH (5)**

See BIOS 401. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301. Department permission required. Corequisite(s): BIOS 412. Repeatable for Credit. Offered Spring. Instructor(s): Silberg.

**BIOS 403 UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY (5)**

Open only to undergraduate majors who meet specific requirements and with permission of the research supervisor and chair. Registration for BIOS 403/404 implies a commitment to participate in research for at least 2 semesters Biosciences Group B. Department permission required. Offered Fall. URL: [www.owlnet.rice.edu/~bios403/](http://www.owlnet.rice.edu/~bios403/). Instructor(s): Strassmann.

**BIOS 404 UNDERGRADUATE HONORS RESEARCH IN ECOLOGY AND EVOLUTIONARY BIOLOGY (5)**

See BIOS 403. Biosciences Group B. Instructor permission required. Offered Spring. URL: [www.owlnet.rice.edu/~bios403/](http://www.owlnet.rice.edu/~bios403/). Instructor(s): Strassmann.

**BIOS 405 INDEPENDENT RESEARCH/INTERNSHIP PROGRAM (0)**

This independent research course offers multi-disciplinary training in the area of cellular engineering within the Departments of Bioengineering and Biochemistry and Cell Biology. Areas of research will include engineering of hard and soft tissue formation, cardiovascular tissue engineering, engineering cell surface interactions regulating movement and metabolic engineering. Students will conduct independent research under the supervision of a faculty mentor. Offered Summer.

**BIOS 412 UNDERGRADUATE RESEARCH SEMINAR (1)**

Discussion of current research in the area under investigation. A substantial written report of the BIOS 401/402 is required. Department permission required. Corequisite(s): BIOS 402. Repeatable for Credit. Offered Spring. Instructor(s): Silberg.

**BIOS 421 NEUROBIOLOGY (3)**

Cellular and molecular mechanisms of nervous system function. Emphasis on membrane and synaptic biophysics, sensory and motor systems, neuronal plasticity, and development. Open to juniors and seniors. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301. Offered Spring.

**BIOS 422 ENDOCRINOLOGY (3)**

Study of the molecular and cellular mechanisms of hormone synthesis and of target cell responses. Study of the role of hormone action in mammalian physiological responses. Biosciences Group A. Prerequisite(s): BIOS 201 and BIOS 202 and BIOS 301 and BIOS 341. Limited enrollment. Not offered this academic year. Instructor(s): Beckingham.

**BIOS 423 IMMUNOBIOLOGY (3)**

Cellular and molecular basis of immune function in mammals. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202. Recommended prerequisite(s): BIOS 301 or BIOS 341. Offered Fall & Spring. Instructor(s): Novotny.

**BIOS 424 MICROBIOLOGY AND BIOTECHNOLOGY (3)**

Structure and functions of microorganisms with emphasis on their environmental, industrial and medical importance. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301 or permission of instructor. Offered Fall. Instructor(s): Bennett.

**BIOS 425 PLANT MOLECULAR GENETICS AND DEVELOPMENT (3)**

Novel aspects of plant biology and development with emphasis on molecular and genetic mechanisms. Plant responses to the environment and the use of bioengineering and other means to develop new plant products will also be covered. Biosciences Group A. Graduate/Undergraduate version: BIOS 525. Prerequisite(s): BIOS 201 and BIOS 301 and BIOS 341 or permission of instructor. Offered Fall. URL: [www.owlnet.rice.edu/~bios425/](http://www.owlnet.rice.edu/~bios425/). Instructor(s): Braam; Bartel.

**BIOS 432 ADVANCED EVOLUTIONARY BIOLOGY (3)**

Develop a critical understanding of evolutionary theory through lectures and discussion across a wide range of evolutionary topics. With the instructor's help, students will use current papers to stimulate debate on the theories, philosophies and methods of the study of evolution. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 and BIOS 202 and (BIOS 334 or BIOS 321). Offered Spring. Instructor(s): Strassmann.

**BIOS 433 ADVANCED ECOLOGY (3)**

Students will develop a critical understanding of the discipline of ecology through a combination of lectures and discussion that span a range of topics. With the instructor's help, students will use current papers to stimulate debate on the theories, philosophies and methods of the study of populations, communities, and ecosystems. Group B Biosciences Group B. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 325 or permission of instructor. Offered Spring. URL: [www.owlnet.rice.edu/~bios433/](http://www.owlnet.rice.edu/~bios433/).

**BIOS 440 ENZYME MECHANISMS (3)**

Enzymology is a biological extension of organic chemistry. This course will survey examples of enzyme-catalyzed reactions with emphasis on mechanisms. Enzymes that use catalytic cofactors (vitamins) will be covered, as will those that rely on amino acid side chains. Biosciences Group A. Cross-listed with CHEM 440. Pre-requisite(s): CHEM 212. Offered Spring. Instructor(s): Parry.

**BIOS 443 DEVELOPMENT (3)**

Analysis of the processes and principles of development as seen in a broad spectrum of eukaryotic organisms. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 341 or permission of instructor. Offered Spring. Instructor(s): Lane.

**BIOS 445 ADVANCED MOLECULAR BIOLOGY AND GENETICS (3)**

Molecular and genetic aspects of the regulation of gene expression as seen in simple prokaryotic systems and the model eukaryotic systems used for studies of development. Biosciences Group A. Prerequisite(s): BIOS 201 and BIOS 202 and BIOS 301 and BIOS 344. Offered Fall. Instructor(s): Stern; Gustin; Wagner.

**BIOS 464 EXTRACELLULAR MATRIX (3)**

This course will address the biology, organization, mechanics, and turnover of extracellular matrix. There will be an emphasis on cells and cell-matrix interactions, matrix distributions in connective tissues and organs, techniques for measurement and modeling, changes with growth and aging, and tissue/matrix degradation including enzyme kinetics. Biosciences Group A. Cross-listed with BIOE 464. Prerequisite(s): BIOS 372 or permission of instructor. Offered Spring. Instructor(s): Grande-Allen.

**BIOS 481 MOLECULAR BIOPHYSICS I (3)**

Emphasis on biophysical methods to study conformation and dynamics of biological macromolecules, in particular proteins. Spectroscopic methods (absorption, fluorescence, linear and circular dichroism), transport processes, sedimentation, light scattering, calorimetry and more. Ligand-protein interactions, chemical kinetics and protein folding will also be covered. Biosciences Group A. Graduate/Undergraduate version: BIOS 551. Pre-requisite(s): BIOS 301 and BIOS 352 or permission of instructor. Offered Fall. Instructor(s): Wittung-Stafshede.

**BIOS 482 MOLECULAR BIOPHYSICS II (3)**

Advanced treatment of X-ray crystallography, NMR spectroscopy, and electron microscopy. Emphasis on theory and application of these methods for the determination of the three-dimensional structure and dynamics of biological molecules and complexes. Biosciences Group A. Graduate/Undergraduate version: BIOS 552. Recommended prerequisite(s): BIOS 301, BIOS 352, BIOS 481, working knowledge of a programming language such as Fortran, C, Basic, MATLAB, or Pascal. Limited enrollment. Offered Spring. Instructor(s): Nikonowicz; Tao.

**BIOS 488 ADVANCED CELL BIOLOGY (3)**

Review of literature on current biosciences research, with emphasis on human diseases, their treatment, and drug discovery. Biosciences Group A. Graduate/Undergraduate version: BIOS 588. Instructor(s): Gomer.

**BIOS 525 PLANT MOLECULAR GENETICS AND DEVELOPMENT (3)**

Novel aspects of plant biology and development with emphasis on molecular and genetic mechanisms. Plant responses to the environment and the use of bioengineering and other means to develop new plant products will also be covered. Graduate/Undergraduate version: BIOS 425. Pre-requisite(s): BIOS 201 and BIOS 301 and BIOS 341. Offered Fall. URL: [www.owlnet.rice.edu/~bios425/](http://www.owlnet.rice.edu/~bios425/). Instructor(s): Braam; Bartel.

**BIOS 530 LAB MODULE IN NMR SPECTROSCOPY AND MOLECULAR MODELING (2)**

The students will learn to set up, acquire, and process one-dimensional and basic two-dimensional NMR experiments. Spectral interpretation (resonance assignment and extraction of structural information) for nucleic acids and proteins using homonuclear and heteronuclear data will be performed. Enrollment limited to 12, with priority to graduate students. Offered first half of the semester. Pre-requisite(s): BIOS 352 or permission of instructor. Corequisite(s): BIOS 481 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Nikonowicz; Moran.

**BIOS 532 LABORATORY MODULE IN OPTICAL SPECTROSCOPY AND KINETICS (2)**

Students learn the principles behind fluorescence, circular dichroism, analytical ultracentrifugation, spectroscopy and rapid kinetics by carrying out experiments with genetically engineered proteins and state-of-the-art equipment. Data will be interpreted and manipulated using curve fitting and graphics software. Offered second half of the semester. Recommended Prerequisite(s): BIOS 352 or equivalent. Concurrent or previous enrollment in BIOS 481 or BIOS 551. Limited enrollment. Offered Fall. URL: [www.bioc.rice.edu/bios532/bios532.html](http://www.bioc.rice.edu/bios532/bios532.html). Instructor(s): Cates.

**BIOS 533 BIOINFORMATICS & COMPUTATIONAL BIOLOGY (2)**

An introduction to the emerging field of bioinformatics. A series of lectures, combined with hands-on exercises. The topics to be discussed include sequence comparison, structure analysis, phylogenetics, database searching, microarrays and proteomics. Recommended prerequisite(s): BIOS 301 or permission of instructor. Offered Fall. URL: [www.bioc.rice.edu/bios533/bioinfo.html](http://www.bioc.rice.edu/bios533/bioinfo.html). Instructor(s): Cates.

**BIOS 535 PRACTICAL X-RAY CRYSTALLOGRAPHY (2)**

This is an introduction to macromolecular crystallography with emphasis on crystallization methods, data acquisition, processing and molecular model building. Approaches to solving structures will be discussed, as well as refinement of molecular models. Offered second half of the semester. Prerequisite(s): BIOS 481 or BIOS 551. Corequisite(s): BIOS 482, BIOS 552. Offered Spring. URL: [www.owlnet.rice.edu/~bios535/](http://www.owlnet.rice.edu/~bios535/). Instructor(s): Cates; Tao.

**BIOS 541 SPECIAL TOPICS IN ECOLOGY AND EVOLUTIONARY BIOLOGY (1)**

Repeatable for Credit. Instructor(s): Strassmann.

**BIOS 542 SPECIAL TOPICS IN ECOLOGY AND EVOLUTIONARY BIOLOGY (1)**

Repeatable for Credit. Instructor(s): Strassmann.

**BIOS 543 SECONDARY METABOLISM (3)**

A survey of the biosynthetic pathways leading to the major classes of natural products. Topics covered include the use of radioactive and stable isotopes, the synthesis of labeled organic compounds, mechanistic investigations of secondary metabolic enzymes, and the cloning and characterization of secondary metabolic genes. Biosciences Group A. Cross-listed with CHEM 543. Pre-requisite(s): CHEM 212. Not offered this academic year. Instructor(s): Parry.

**BIOS 544 DEVELOPMENT (3)**

Analysis of the processes and principles of development as seen in a broad spectrum of eukaryotic organisms. Biosciences Group A. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301 and BIOS 341 or permission of instructor. Offered Spring.

**BIOS 545 ADVANCED MOLECULAR BIOLOGY AND GENETICS (3)**

Molecular and genetic aspects of the regulation of gene expression as seen in simple prokaryotic systems and the model eukaryotic systems used for studies of development. Pre-requisite(s): BIOS 201 and BIOS 202 and BIOS 301 and BIOS 344. Offered Fall. Instructor(s): Stern; Gustin; Wagner.

**BIOS 551 MOLECULAR BIOPHYSICS (3)**

Emphasis on biophysical methods to study conformation and dynamics of biological macromolecules, in particular proteins. Spectroscopic methods (absorption, fluorescence, linear and circular dichroism), transport processes, sedimentation, light scattering, calorimetry and more. Ligand-protein interactions, chemical kinetics and protein folding will also be covered. Graduate/Undergraduate version: BIOS 481. Pre-requisite(s): BIOS 301 and BIOS 352 or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Wittung-Stafshede.

**BIOS 552 MOLECULAR BIOPHYSICS II (3)**

Advanced treatment of X-ray crystallography, NMR spectroscopy, and electron microscopy. Emphasis on theory and application of these methods for the determination of the three-dimensional structure and dynamics of biological molecules and complexes. Graduate/Undergraduate version: BIOS 482. Recommended prerequisite(s): BIOS 301, BIOS 352, BIOS 481. Limited enrollment. Offered Spring. Instructor(s): Nikonowicz, Tao.

**BIOS 561 TOPICS IN EVOLUTION (2)**

Review and discussion of the literature on current research in evolution. Recommended prerequisite(s): Graduate standing or permission of chair or instructor. Repeatable for Credit. Offered Fall. Instructor(s): Strassmann; Queller; Kohn; Whitney.

**BIOS 562 TOPICS IN BEHAVIORAL BIOLOGY (2)**

Review and discussion of the literature on current research in animal behavior and evolution. Recommended prerequisite(s): Graduate standing or permission of chair or instructor. Repeatable for Credit. Offered Spring. Instructor(s): Strassmann; Queller; Kohn; Meffert.

**BIOS 563 TOPICS IN ECOLOGY (2)**

Review and discussion of the literature on current research in ecology. Repeatable for Credit. Offered Fall. URL: [www.owlnet.rice.edu/~bios563](http://www.owlnet.rice.edu/~bios563). Instructor(s): Siemann; Holland; Rudgers.

**BIOS 568 TOPICS IN BIOLOGICAL DIVERSITY (2)**

Review and discussion of literature on current research in biological diversity. Instructor permission required. Repeatable for Credit. Limited enrollment. Offered Spring. URL: [www.owlnet.rice.edu/~bios568](http://www.owlnet.rice.edu/~bios568). Instructor(s): Siemann; Holland; Rudgers.

**BIOS 569 CORE COURSE IN ECOLOGY AND EVOLUTIONARY BIOLOGY (3)**

Survey of topics in ecology and evolution taught by all EEB faculty. Offered Fall. Instructor(s): Whitney; Siemann; and EEB faculty.

**BIOS 575 INTRODUCTION TO RESEARCH (1)**

Introduction of first-year graduate students to the research programs and laboratories of individual faculty members. Open only to BCB graduate students. Offered Fall.

**BIOS 576 FOUNDATIONS OF BIOTECHNOLOGY (1)**

Graduate level introduction to a wide range of research methods in biosciences and bioengineering. Individual faculty members from the Biosciences will each present practices and techniques for their areas of expertise. A web-based methods database will be constructed, with student involvement, from the library of lectures. Cross-listed with BIOE 576. Offered Fall. Instructor(s): West.

**BIOS 577 FOUNDATIONS OF BIOTECHNOLOGY (1)**

Graduate level introduction to a wide range of research methods in biosciences and bioengineering. Individual faculty members from the biosciences and bioengineering will each present practices and techniques for their areas of expertise. A web-based methods database will be constructed, with student involvement, from the library of lectures. Cross-listed with BIOE 577. Offered Spring. Instructor(s): West.

**BIOS 578 BIOTECHNOLOGY PRACTICUM (1)**

This course is part of the NIH Biotechnology Training Program and is limited to program participants. Students will receive exposure and training in cutting edge concepts and technologies. Limited enrollment.

**BIOS 581 GRADUATE SEMINAR IN BIOCHEMISTRY AND CELL BIOLOGY (1)**

A discussion of selected research topics. Required of all Biochemistry and Cell Biology graduate students. Must be in one of the following Classification(s): Graduate. Must be enrolled in one of the following Level(s): Graduate. Open only to BCB graduate students. Repeatable for Credit. Offered Fall. Instructor(s): Stern; McNew; Gomer.

**BIOS 582 GRADUATE SEMINAR IN BIOCHEMISTRY AND CELL BIOLOGY (1)**

See BIOS 581. Must be in one of the following Classification(s): Graduate. May not be enrolled in any of the following Level(s): Graduate. Open only to BCB graduate students. Repeatable for Credit. Offered Spring. Instructor(s): Stern; Nikonowicz; Tao.

**BIOS 583 MOLECULAR INTERACTIONS (3)**

Review of literature on current biosciences research. Must be in one of the following Classification(s): Graduate. Must be enrolled in one of the following Level(s): Graduate. Open only to BCB graduate students. Offered Fall. Instructor(s): Silberg; Tao; McNew; Lane.

**BIOS 585 GRADUATE SEMINAR IN ECOLOGY AND EVOLUTIONARY BIOLOGY (1)**

Faculty and student presentations on current research. Required of all Ecology & Evolutionary Biology graduate students. Repeatable for Credit. Offered Fall. Instructor(s): Kohn.

**BIOS 586 GRADUATE SEMINAR/ECOLOGY AND EVOLUTIONARY BIOLOGY (1)**

Continuation of BIOS 585. Repeatable for Credit. Offered Spring. Instructor(s): Kohn.

**BIOS 587 GRADUATE SEMINAR FOR 1ST YEAR GRADUATE STUDENTS IN BIOCHEMISTRY AND CELL BIOLOGY (3)**

Preparation and presentation of research proposals. Must be in one of the following Classification(s): Graduate. Must be enrolled in one of the following Level(s): Graduate. Open only to BCB graduate students. Offered Spring. Instructor(s): Bartel; Stern.

**BIOS 588 ADVANCED CELL BIOLOGY (3)**

Review of literature on current biosciences research, with emphasis on human diseases, their treatment, and drug discovery. Biosciences Group A. Graduate/Undergraduate version: BIOS 488. Offered Spring. Instructor(s): Gomer.

**BIOS 589 COMPUTATIONAL MOLECULAR BIOENGINEERING/BIOPHYSICS (3)**

This is a course designed for students in computationally oriented biomedical and bioengineering majors to introduce the principles and methods used for the simulations and modeling of macromolecules of biological interest. Protein conformation and dynamics are emphasized. Empirical energy function and molecular dynamics calculations, as well as other approaches, are described. Specific biological problems are discussed to illustrate the methodology. Cross-listed with BIOE 589. Offered Fall. Instructor(s): Ma.

**BIOS 590 SPECIAL TOPICS IN BIOCHEMISTRY AND CELL BIOLOGY (1)**

Development of specific topic areas at the graduate level.

**BIOS 591 GRADUATE TEACHING IN ECOLOGY AND EVOLUTIONARY BIOLOGY (3)**

Supervised instruction in teaching Ecology & Evolutionary Biology. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Strassmann.

**BIOS 592 SEMINAR IN COMPUTATIONAL BIOLOGY (1)**

A discussion of selected research topics in computational biology. Repeatable for Credit. Offered Fall & Spring.

**BIOS 593 SPECIAL TOPICS IN BIOCHEMISTRY AND CELL BIOLOGY (1)**

Discussion of selected research topics in current plant biology literature. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Braam; Bartel.

**BIOS 594 TRAINING IN THE RESPONSIBLE CONDUCT OF RESEARCH (1)**

This course will consider ethical issues involving human and animal subjects, record keeping, publications, potential conflict of interest, and behavior toward colleagues, research fellows, students, and employees. Cross-listed with BIOE 594. Must be enrolled in one of the following Level(s): Graduate. Limited enrollment. Offered Fall. Instructor(s): Stewart, Beckingham.

**BIOS 599 GRADUATE TEACHING IN BIOCHEMISTRY AND CELL BIOLOGY (1)**

Supervised instruction in teaching biochemistry and cell biology. Must be enrolled in one of the following Major(s): Biochemistry and Cell Biology. Must be in one of the following Classification(s): Graduate. Repeatable for Credit. Limited enrollment. Offered Fall & Spring.

**BIOS 611 RESEARCH SEMINAR (3)**

Discussion of individual laboratory research or current topics in particular areas. Repeatable for Credit. Offered Fall.

**BIOS 612 RESEARCH SEMINAR (3)**

Continuation of BIOS 611. Must be enrolled in one of the following Major(s): Biochemistry and Cell Biology. Must be in one of the following Classification(s): Graduate. Repeatable for Credit. Offered Spring.

**BIOS 621 THESIS SEMINAR (1)****BIOS 622 THESIS SEMINAR (1)****BIOS 643 MECHANICAL AND THERMODYNAMIC PROPERTIES OF BIOMEMBRANES (3)**

The mechanical properties of membranes influence several biological processes including endocytosis, fusion, signaling a cellular differentiation. This course will cover the theoretical foundations for membrane mechanics, examine experimental methods for measuring membrane material properties, including nanomechanical and optical techniques, and emphasize the importance of membrane mechanics in bioengineering applications. Cross-listed with PHYS 643. Instructor permission required. Instructor(s): Raphael.

**BIOS 701 GRADUATE LAB RESEARCH I (1 TO 4)**

Graduate research in Biochemistry and Cell Biology. Designed for short-term laboratory projects for first year graduate students. Recommended prerequisite(s): Graduate standing in Biochemistry and Cell Biology. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Stern.

**BIOS 702 GRADUATE LAB RESEARCH II (1 TO 4)**

Graduate research in Biochemistry and Cell Biology. Designed for short-term laboratory projects for first year graduate students. Recommended prerequisite(s): Graduate standing in Biochemistry and Cell Biology. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Stern.

**BIOS 777 VISITING RESEARCH TRAINEE (0)****BIOS 800 BIOCHEMISTRY & CELL BIOLOGY GRADUATE RESEARCH (1 TO 15)**

Repeatable for Credit. Offered Fall & Spring.

**BIOS 801 EEB GRADUATE RESEARCH (1 TO 15)**

Repeatable for Credit. Offered Fall & Spring. Instructor(s): Strassman.

**CAAM (COMP. & APPLIED MATHEMATICS)****School of Engineering/Computational & Applied Math****CAAM 210 INTRODUCTION TO ENGINEERING COMPUTATION (3)**

Modeling, Simulation, and Visualization via MATLAB. Numerical methods: Newton's method in one and several dimensions. Gaussian elimination and optimization. Application to gene nets, fiber nets, and neural nets. Lab is on Fridays from 1-4pm, but students are not expected to attend the entire lab section and are free to come and go. A good rule of thumb is to plan to be in lab for about one hour per week (anytime between 1 and 4pm). Pre-requisite(s): MATH 101. Offered Fall & Spring.

**CAAM 335 MATRIX ANALYSIS (3 TO 4)**

Equilibria and the solution of linear systems and linear least square problems. Dynamical systems and the eigenvalue problem with the Jordan form and Laplace transform via complex integration. Optional 1credit laboratory motivates concepts from the course via physical experiments with vibrating beaded strings. Pre-requisite(s): MATH 212 and CAAM 210. Offered Fall & Spring.

**CAAM 336 DIFFERENTIAL EQUATIONS IN SCIENCE AND ENGINEERING (3 TO 4)**

Classical and numerical solution techniques for ordinary and partial differential equations. Fourier series and the finite element method for initial and boundary value problems arising in diffusion and wave propagation phenomena. Optional 1-credit laboratory motivates concepts from the course via physical experiments with vibrating musical instrument strings. Pre-requisite(s): MATH 212 and CAAM 210. Offered Fall & Spring.

**CAAM 353 COMPUTATIONAL NUMERICAL ANALYSIS (3)**

An introductory course in numerical analysis with computer applications. Topics include floating-point arithmetic; algorithms for the solution of linear systems, linear least square problems, and nonlinear equations; interpolation; Fourier transform; numerical integration; numerical solution of ordinary differential equations. Computer programming in Matlab is required. Pre-requisite(s): MATH 212. Offered Spring.

**CAAM 378 INTRODUCTION TO OPERATIONS RESEARCH AND OPTIMIZATION (3)**

Formulation and solution of mathematical models in management, economics, engineering and science applications in which one seeks to minimize or maximize an objective function subject to constraints, including models in linear, nonlinear and integer programming; basic solution methods for these optimization models; problem solving using a modeling language and optimization software. Pre-requisite(s): MATH 212 and (CAAM 335 or MATH 211 or MATH 355). Offered Fall.

**CAAM 401 ANALYSIS I (3)**

Real numbers, completeness, sequences and convergence, compactness, continuity, the derivative, the Riemann integral, fundamental theorem of calculus. Vector spaces, dimension, linear maps, inner products and norms. Pre-requisite(s): MATH 211 and MATH 212 or permission of instructor. Offered Fall.

**CAAM 402 ANALYSIS II (3)**

Continuation of Analysis I. Vector spaces of functions, sequences and series, convergence. Continuity and differentiability of functions of several variables, the derivative as a linear map, the contraction mapping principle, inverse and implicit function theorems, fundamental theorems on differential equations, multivariable integration, Stoke's theorem and relatives. Pre-requisite(s): CAAM 401. Offered Spring.

**CAAM 415 THEORETICAL NEUROSCIENCE (3)**

This course introduces current theoretical methods used to model the properties of nerve cells and the processing of information by neuronal networks. Concrete examples that can be implemented using MATLAB will be emphasized. The starting point is the passive cable properties of single neurons and the Hodgkin-Huxley model of action potential generation. Subsequently, models of synaptic transmission and active properties of dendritic trees will be considered. This will be followed by stochastic properties of single neurons and information encoding using mean and instantaneous firing rates in visual neurons. Finally, methods to analyze phase locking and activity in populations of cells as well as learning algorithms will be considered. Cross-listed with NEUR 415. Pre-requisite(s): MATH 211 or CAAM 335. Offered Spring.

**CAAM 420 COMPUTATIONAL SCIENCE I (3)**

Scientific programming using high-level languages, including C, Fortran, and C++. Emphasis on use of numerical libraries. Basic techniques of project planning, source management, documentation, program construction, i/o, visualization. Object-oriented design for numerical computing. Pre-requisite(s): CAAM 210 and CAAM 335 or CAAM 353 or permission of instructor. Offered Fall.

**CAAM 435 DYNAMICAL SYSTEMS (3)**

Existence and uniqueness for solutions of ordinary differential equations and difference equations, linear systems, nonlinear systems, stability, periodic solutions, bifurcation theory. Theory and theoretical examples are complemented by computational, model driven examples from biological and physical sciences. Cross-listed with MATH 435. Pre-requisite(s): CAAM 210 and MATH 212 and (CAAM 335 or MATH 335) and (CAAM 401 or MATH 321). Offered Fall.

**CAAM 436 PDES OF MATHEMATICAL PHYSICS (3)**

Derivation and properties of solutions of the partial differential equations of continuum physics. Basic concepts of continuum mechanics, ideal fluids, Navier-Stokes equations, linear elasticity, acoustics, basic principles of thermodynamics, Newtonian heat flow, porous flow, Maxwell's equations, electrical circuits. Pre-requisite(s): CAAM 336 or permission of instructor. Offered Fall.

**CAAM 437 METHODS OF MATHEMATICAL PHYSICS (3)**

Analysis of the solutions of the partial differential equations of continuum physics. First, order linear and non-linear PDEs and systems of PDEs, characteristics, shocks. Sturm-Liouville problems and Fourier series. Integral transforms: Fourier and Laplace. Integral relations and Green's functions. Asymptotic methods: regular perturbation methods, singular perturbations, geometric optics. CAAM 402 may be taken concurrently. Pre-requisite(s): CAAM 402 and CAAM 436 or permission of instructor. Offered Spring.

**CAAM 441 SEISMOLOGY I (3)**

Principles of elastic wave propagation, the determination of Earth structure, and the understanding of earthquake systems. Cross-listed with ESCI 461. Pre-requisite(s): MATH 211 and PHYS 101 and PHYS 102. Offered Fall.

**CAAM 452 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS (4)**

Structure and properties of the finite element method for static problems in mechanics, electromagnetism, and other field theories. Finite difference methods for initial/boundary value problems of fluid flow, heat transfer, and wave motion. Computer programming in MATLAB is required. Prerequisite(s): CAAM 336 or permission of instructor. Recommended prerequisite(s): CAAM 436.

**CAAM 453 NUMERICAL ANALYSIS I (3)**

Construction and analysis of numerical algorithms for root finding, interpolation and approximation of functions, quadrature, and the solution of differential equations; fundamentals of computer arithmetic; solution of linear systems, least squares problems, and eigenvalue problems via matrix factorizations; the singular value decomposition (SVD) and basic sensitivity analysis. Computer programming in MATLAB is required. Pre-requisite(s): CAAM 335 or permission of instructor. Offered Fall.

**CAAM 454 NUMERICAL ANALYSIS II (3)**

Iterative methods for linear systems of equations including Krylov subspace methods; gradient method for unconstrained optimization; Newton and Newton-like methods for nonlinear systems of equations, unconstrained optimization and nonlinear least squares problems; techniques for improving the global convergence of these algorithms. Theoretical and practical considerations for these algorithms will be discussed. Computer programming in MATLAB is required. Pre-requisite(s): CAAM 453 or permission of instructor. Offered Spring.

**CAAM 460 OPTIMIZATION THEORY (3)**

Derivation and application of necessity conditions and sufficiency conditions for constrained optimization problems. Pre-requisite(s): MATH 212 and (CAAM 335 or MATH 355). Offered Fall. Instructor(s): Tapia.

**CAAM 464 NUMERICAL OPTIMIZATION (3)**

Numerical algorithms for constrained optimization problems in engineering and sciences, including simplex and interior-point methods for linear programming, penalty, barrier, augmented Lagrangian and SQP methods for nonlinear programming. Pre-requisite(s): CAAM 454 or permission of instructor. Recommended prerequisite(s): CAAM 460 (may be taken concurrently). Offered Fall.

**CAAM 469 DYNAMICAL SYSTEMS LAB (1)**

Modeling, simulation and visualization of dynamical systems in MATLAB.

**CAAM 470 INTRODUCTION TO GRAPH THEORY (3)**

Study of the structure and properties of graphs, together with a variety of applications. Includes paths, cycles, trees, connectivity, matchings, colorings, planarity, directed graphs, and algorithms. Some knowledge of linear algebra is recommended. Offered Spring.

**CAAM 474 COMBINATORIAL OPTIMIZATION (3)**

General theory and approaches for solving combinatorial optimization problems are studied. Specific topics include basic polyhedral theory, minimum spanning tree, shortest paths, network flow, matching and matroids. The course will also cover the traveling salesman problem. Pre-requisite(s): CAAM 378 or CAAM 464 or permission of instructor. Instructor(s): Hicks.

**CAAM 475 INTEGER PROGRAMMING (3)**

Modeling and solving optimization problems with discrete components, graphs and networks; network flow problems; minimum spanning trees; basic polyhedral theory; the knapsack problem; the plant location problem; the set packing problem; computational complexity; branch and bound; cutting planes; Lagrangian relaxation and Bender's decomposition. Cross-listed with ECON 475. Pre-requisite(s): CAAM 378 or CAAM 464 or permission of instructor. Instructor(s): Yin.

**CAAM 490 INDEPENDENT STUDY (1 TO 6)**

Repeatable for Credit. Offered Fall.

**CAAM 491 INDEPENDENT STUDY (1 TO 6)**

Repeatable for Credit. Offered Spring.

**CAAM 499 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 6)**

This course prepares a student for research in the mathematical sciences on a specific topic. Each section is dedicated to a different topic. Current topics include bioinformatics, biomathematics, computational finance, simulation driven optimization, data simulation, and spectral optimization in rational mechanics. The topics may vary each semester. Cross-listed with MATH 499, STAT 499. Repeatable for Credit. Offered Fall & Spring.

**CAAM 500 GRADUATE RESEARCH SEMINAR (1)**

Presentations of ongoing projects by CAAM students and faculty. Repeatable for Credit. Offered Fall & Spring.

**CAAM 508 ORDINARY DIFFERENTIAL EQUATIONS (3)**

Review of the fundamental properties of nonlinear systems, includes nonlinear ordinary differential equations (e.g., the existence and uniqueness of solutions), Lyapunov stability (e.g., stability of definitions, Lyapunov's direct method, invariance theory, stability of linear systems, Lyapunov's linearization methods, and converse theorems), and input-output stability (e.g., the small gain theorem and passivity theorem), as well as case studies showing applications to nonlinear and adaptive control and robotics. Course not offered every year. Cross-listed with ELEC 508, MECH 508.



**CAAM 520 COMPUTATIONAL SCIENCE II (3)**

Vector, shared-memory, and message-passing parallel computer architectures. Numerical linear algebra for these architectures. Memory hierarchy issues, analysis and enhancement of performance, and use of programming tools and environments. Application interfaces including OpenMP and MPI, parallel numerical algorithms and scientific visualization. Pre-requisite(s): CAAM 420. Offered Spring.

**CAAM 533 ADVANCED STATISTICAL INFERENCE (3)**

Cross-listed with STAT 533.

**CAAM 540 APPLIED FUNCTIONAL ANALYSIS (3)**

Hilbert spaces, Banach spaces, spectral theory, and weak topologies with applications to signal processing, control, and partial differential equations. Pre-requisite(s): CAAM 402 or permission of instructor. Offered Spring.

**CAAM 542 SEISMOLOGY II (3)**

Review elastodynamics. Calculation of synthetic seismograms for acoustic and elastic media using reflectivity, asymptotic and finite difference methods. Migration of reflection data by finite differences, FK and Kirchhoff methods. Travel time inversion. Pre-requisite(s): CAAM 441 or ESCI 461. Offered Fall.

**CAAM 551 NUMERICAL LINEAR ALGEBRA (3)**

Direct methods for large, sparse linear systems; regularization of ill-conditioned least squares problems; backward error analysis of basic algorithms for linear equations and least squares, sensitivity and conditioning of linear systems and least square problems; condition estimation. Preconditioned iterative methods for linear systems (CG, GMRES, BiCGstab, QMR); multigrid methods. Matrix theory including spectral decompositions, Schur form, eigenvalue perturbation theory, and the geometry of subspaces. Eigenvalue algorithms. Sylvester and Lyapunov equations, the implicitly shifted QR algorithm, computation of the SVD, generalized eigenvalue problems. Introduction to large-scale eigenvalue algorithms. Proficiency in MATLAB and acquaintance with one or more of C, F77, C++, F90 is required. Pre-requisite(s): CAAM 453 or permission of instructor. Offered Fall.

**CAAM 552 PARTIAL DIFFERENTIAL EQUATIONS (3)**

Analysis of boundary and initial value problems. Dirichlet problem for Laplace's equation, variational formulation, Rayleigh-Ritz principle, Sobolev spaces, weak solutions, interior and boundary regularity, convergence of the finite element method, heat equation and the Gaussian kernel, maximum principle, stability, consistency, and convergence of numerical methods. Pre-requisite(s): CAAM 402 and CAAM 452. Offered Spring.

**CAAM 553 PARTIAL DIFFERENTIAL EQUATIONS II (3)**

Mathematical analysis of wave propagation. Hyperbolic systems, energy estimates, existence of weak solutions, domains of dependence and influence, Green's functions, geometric optics, boundary value problems, numerical methods. Pre-requisite(s): CAAM 402 and CAAM 436. Recommended courses: CAAM 540 and CAAM 552. Offered Fall. Instructor(s): Symes.

**CAAM 554 CONVEX OPTIMIZATION (3)**

Convex optimization problems arise in communication, system theory, VLSI, CAD, finance, inventory, network optimization, computer vision, learning, statistics, etc. even though oftentimes convexity may be hidden and unrecognized. Recent advances in interior-point methodology have made it much easier to solve these problems and various solvers are now available. This course will introduce the basic theory and algorithms for convex optimization, as well as its many applications to computer science, engineering, management science and statistics. Topics covered: Convex sets and functions, convex conic programming (including linear, quadratic, second-order cone and semidefinite programming), duality theory, interior-point algorithms, and various applications. Recommended Prerequisite(s): Linear algebra and basic analysis. Matlab programming experience will help. No previous background in linear or nonlinear optimization is required. Offered Fall. Instructor(s): Yin.

**CAAM 563 ENGINEERING APPROACH TO MATH PROGRAM (3)**

Study of the minimization of functions of variables that are either unconstrained, subject to equality constraints, subject to inequality constraints, or subject to both equality and inequality constraints. Includes analytical and computational methods. Cross-listed with MECH 563.

**CAAM 581 MATHEMATICAL PROBABILITY I (3)**

Measure-theoretic foundations of probability for students who need access to advanced mathematical literature in probability and random processes. Cross-listed with STAT 581.

**CAAM 583 INTRODUCTION TO RANDOM PROCESSES AND APPLICATIONS (3)**

Review of basic probability and the formulation, analysis, representation, and application of some standard random processes. Include sequences of random variables, random vectors and estimation, basic concepts of random processes, random processes in linear systems, expansions of random processes, Wiener filtering, spectral representation of random processes, and white-noise integrals. Cross-listed with ELEC 533, STAT 583. Pre-requisite(s): STAT 381. Recommended prerequisite(s): STAT 581.

**CAAM 590 INDEPENDENT STUDY (1 TO 15)**

Repeatable for Credit. Offered Fall.

**CAAM 591 INDEPENDENT STUDY (1 TO 15)**

Repeatable for Credit. Offered Spring.

**CAAM 640 OPTIMIZATION WITH SIMULATION CONSTRAINTS (3)**

Content varies from year to year. Pre-requisite(s): CAAM 464 or permission of instructor. Repeatable for Credit.

**CAAM 641 TOPICS IN INVERSE PROBLEMS (3)**

Theoretical, computational and practical issues for inverse problems in science and engineering. Selected topics will vary depending on instructor and student interests. Instructor permission required. Repeatable for Credit.

**CAAM 651 TOPICS IN NUMERICAL LINEAR ALGEBRA (1 TO 3)**

Selected topics will vary depending on instructor and student interests. Derivation and analysis of Krylov and subspace iteration methods for large eigenvalue problems (Lanczos, Arnoldi, Jacobi-Davidson algorithms); preconditioning for linear systems and eigenvalue problems (incomplete LU, domain decomposition, multigrid); convergence analysis including potential theory and pseudospectra. Applications: regularization of discrete inverse problems; dimension reduction for large dynamical control systems; effects on non-normality on behavior of dynamical systems and iterative processes. Prerequisite(s): CAAM 551 or permission of instructor. Repeatable for Credit. Offered Spring. Instructor(s): Sorensen.

**CAAM 652 TOPICS IN NUMERICAL DIFFERENTIAL EQUATIONS (3)**

Content varies from year to year. Repeatable for Credit.

**CAAM 654 TOPICS IN OPTIMIZATION (3)**

Content varies from year to year. Repeatable for Credit.

**CAAM 664 TOPICS IN NONLINEAR PROGRAMMING (3)**

Content varies from year to year.

**CAAM 699 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 9)**

This course prepares a student for research in the mathematical sciences on a specific topic. Each section is dedicated to a different topic. Current topics include bioinformatics, biomathematics, computational finance, simulation driven optimization, data simulation, and spectral optimization in rational mechanics. The topics may vary each semester. Cross-listed with MATH 699, STAT 699. Repeatable for Credit. Offered Fall & Spring.

**CAAM 800 THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall & Spring.

**CEVE (CIVIL AND ENVIRONMENTAL ENG)****School of Engineering/Civil & Environmental Engineering****CEVE 100 AP CREDIT IN ENVIRONMENTAL SCIENCE (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams. This credit counts toward the total credit hours required for graduation.

**CEVE 101 FUNDAMENTALS OF CIVIL AND ENVIRONMENTAL ENGINEERING (3)**

This introduction will cover the essential topics and quantitative techniques in civil and environmental engineering. Fluid flow hydrology, engineering mechanics statistics, and mass balance techniques will be presented followed by applications to sustainable urban infrastructure, water quality and water treatment, bridge construction, air and water quality, and urban planning and management principles. Limited enrollment. Offered Fall. Instructor(s): Bedient.

**CEVE 201 URBAN AND ENVIRONMENTAL SYSTEMS (4)**

The chemical, physical, and biological components of the natural environment as resources and their utilization and interaction in environmental control engineering and technology. Lecture and Laboratory is required. Cross-listed with HEAL 201. Limited enrollment. Offered Fall. Instructor(s): Ward.

**CEVE 203 PRINCIPLES OF ENVIRONMENTAL ENGINEERING (3)**

This course provides basic information on principles of water quality engineering, air pollution control and solid and hazardous waste management. Elements of risk assessment, global atmospheric change, and pollution prevention are also addressed to contribute to bare-level competency in Environmental Engineering. Limited enrollment. Offered Fall. Instructor(s): Alvarez.

**CEVE 211 ENGINEERING MECHANICS (3)**

The study of equilibrium of static systems, the dynamics of a particle and particle systems, and rigid-body dynamics. Includes elements of vibrational analysis. Required for mechanical engineering and materials science and engineering majors. Cross-listed with MECH 211. Pre-requisite(s): PHYS 101 and MATH 101 and MATH 102. Offered Fall. Instructor(s): Landis.

**CEVE 304 STRUCTURAL ANALYSIS I (3)**

Analysis of statically determinate structures; stability and determinacy; influence lines and moving loads. Calculation of deflections. Introduction to analysis of indeterminate structures. Limited enrollment. Instructor(s): Veletos.

**CEVE 306 GLOBAL ENVIRONMENTAL LAW AND SUSTAINABLE DEVELOPMENT (3)**

Examination of emerging trends toward sustainable development and global environmental protection. Includes international treaties on management of the oceans, global warming, ozone depletion, biodiversity and development patterns; impact of trade treaties such as NAFTA and GATT. Graduate/Undergraduate version: CEVE 506. May not be in any of the following Classification(s): Graduate. Offered alternate years. Instructor(s): Blackburn.

**CEVE 307 ENERGY AND THE ENVIRONMENT (3)**

This course explores the physical principles of energy use and its impacts on Earth's environments and climate. Topics will include energy mechanics, climate change, and the environmental impacts and future prospects of various fossil fuel and alternative energy sources. Limited enrollment. Offered Spring. Instructor(s): Cohan.

**CEVE 311 MECHANICS OF SOLIDS AND STRUCTURES (3)**

Analysis of stress and deformation of solids with applications to bars, beams, and columns. Study of engineering properties of materials. Applying equilibrium, compatibility, and force-deformation relationships to structural elements. Cross-listed with MECH 311. Pre-requisite(s): CEVE 211 or MECH 211. Limited enrollment. Offered Spring. Instructor(s): Nagarajaiah.

**CEVE 312 STRENGTH OF MATERIALS LAB (1)**

Instruction in standard tension, compression, and torsion tests of ferrous and nonferrous metals. Includes experimental techniques and the behavior of structural elements. Limited enrollment. Offered Spring. Instructor(s): Nagarajaiah.

**CEVE 313 UNCERTAINTY AND RISK IN URBAN INFRASTRUCTURES (3)**

Practical applications and relevance of infrastructure risk are developed in the context of real engineering problems and phenomena, including unique systems and challenges of the gulf coast area. The course starts with a survey of the roles of probability in engineering and focuses on computer-based methods, the Bayesian approach, risk analysis tools, and infrastructure safety. Cross-listed with STAT 313. Prerequisite(s): STAT 310. Repeatable for Credit. Limited enrollment. Instructor(s): Duenas-Osorio.

**CEVE 315 SUSTAINABLE TECHNOLOGIES FOR DEVELOPING COUNTRIES (2)**

This course is an introduction to the concept of sustainable technology with specific reference to rural communities in developing countries. The issue to be addressed is the application of appropriate technologies in the context of a lack of infrastructure and a specific focus on limited access to energy resources. Limited enrollment. Offered Fall. Instructor(s): Tomson; Alvarez.

**CEVE 320 ETHICAL DECISION-MAKING FOR ENGINEERS (2)**

Seminar introduces students to a framework for discussing and making ethical engineering and business decisions. Using case studies and exercises, students will look at their own profession and its Engineering Code of Ethics as well as at the issues and risks they may face as managers and executives. Limited enrollment. Offered Fall. Instructor(s): Ferrill.

**CEVE 322 ENGINEERING ECONOMICS (3)**

Introduction to the evaluation of alternative investment opportunities with emphasis on engineering projects and capital infrastructure. Time value of money concepts are developed in the context of detailed project evaluation and presentations. In addition, concepts and applications of risk analysis and investment under uncertainty are developed. Requires oral and written presentations by students. Cross-listed with ENGI 303. Offered Fall. Instructor(s): Segner; Peterson.

**CEVE 371 FLUID MECHANICS I (3)**

Introduction to fluid statics and dynamics. Includes the development of the fundamental equations of fluid mechanics and their application to problems of engineering interest. Required for civil engineering majors in B.S. program. Cross-listed with MECH 371. Offered Fall.

**CEVE 400 ADVANCED MECHANICS OF MATERIALS (3)**

Advanced topics in solid mechanics and strength of materials including energy methods, principle of virtual work, pressure vessels, beam vibrations, sound waves in solids, buckling, aspects of elasticity theory and fracture mechanics with application to the design of reliable structures. Graduate/Undergraduate version: CEVE 500. Pre-requisite(s): MECH 211 and MECH 311. Offered Spring. Instructor(s): Aiken.

**CEVE 401 INTRODUCTION TO ENVIRONMENTAL CHEMISTRY (3)**

Principles and significance of measurements used to assess environmental quality. Hands-on measurements of both classical titrations and modern instrumental methods of measuring both bulk and trace level pollutant concentrations. Lecture and lab. Limited enrollment. Offered Fall. Instructor(s): Tomson.

**CEVE 402 INTRODUCTION TO ENVIRONMENTAL CHEMISTRY LAB (1)**

Laboratory for CEVE 203 and CEVE 401. Pre-requisite(s): CEVE 203. Limited enrollment. Offered Fall. Instructor(s): Tomson.

**CEVE 405 STEEL DESIGN (3)**

Design of steel members, connections, and assemblies. Behavior of a member as related to design. Limited enrollment. Offered Spring. Instructor(s): Durrani.

**CEVE 406 INTRODUCTION TO ENVIRONMENTAL LAW (3)**

Legal techniques by societies to plan and regulate the use of environmental resources. Cross-listed with ENST 406. Limited enrollment. Offered alternate years. Instructor(s): Blackburn.

**CEVE 407 REINFORCED CONCRETE DESIGN (3)**

Instruction in tests of materials and reinforced concrete members. Corequisite(s): CEVE 408. Offered Fall. Instructor(s): Durrani.

**CEVE 408 CONCRETE LABORATORY (1)**

Instruction in tests of materials and reinforced concrete members. Corequisite(s): CEVE 407. Offered Fall. Instructor(s): Durrani.

**CEVE 411 AIR RESOURCE MANAGEMENT (3)**

Introductory principles necessary for understanding air quality and the sources and control of air pollution. Limited enrollment. Offered Spring. Instructor(s): Fraser.

**CEVE 412 HYDROLOGY AND WATERSHED ANALYSIS (3)**

Fundamentals of the hydrologic cycle, hydrograph techniques, flood routing, and open channel flow. Topics in ground water and well mechanics are covered. Includes computational hydrology, hydrologic design and local watershed applications. Limited enrollment. Offered Spring. Instructor(s): Bedient.

**CEVE 417 FINITE ELEMENT ANALYSIS (3)**

An introduction to finite element analysis by Galerkin's method and the method of least squares as applied to both ordinary and partial differential equations common in engineering applications. Element interpolations, numerical integration, computational considerations for efficient solution and post-processing methods. Application of educational and commercial codes to heat transfer and stress analysis. Cross-listed with MECH 417. Pre-requisite(s): MATH 212 and CAAM 210 or CAAM 211. Instructor(s): Akin.

**CEVE 418 QUANTITATIVE HYDROGEOLOGY (3)**

Advanced course that will provide a quantitative overview of groundwater hydrology. Emphasis will be placed on mastering concepts in fluid mechanics and applying these concepts to water supply, environmental, and geological problems. Cross-listed with ESCI 418. Offered alternate years. Instructor(s): Dugan.

**CEVE 427 MATRIX METHODS IN STRUCTURAL MECHANICS (3)**

Introduction to matrix structural analysis and finite element method, applied to trusses, beams, frames and two dimensional elasticity problems. Use of computer programs for structural analysis of Civil, Mechanical, and Aerospace Structures. Pre-requisite(s): CEVE 311. Limited enrollment. Offered Fall. Instructor(s): Nagarajiah.

**CEVE 434 FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT (3)**

Physical and chemical principles governing the fate and transport of contaminants in the aqueous environment, and the applications of such principles in environmental engineering. Emphasis is put on mass transport and transportation processes in natural and engineering systems. Previous course work in fluid mechanics and calculus through differential equations is strongly suggested. Graduate/Undergraduate version: CEVE 534. Limited enrollment. Offered Fall. Instructor(s): Li.

**CEVE 450 REMOTE SENSING (3)**

Introduction to data display, statistical methods, system simulation, and geostatistics for environmental scientists. The course will emphasize the application of these techniques to real and simulated environmental problems. The lab will involve extensive computer use and the completion of a major individual project on a topic selected by the student. Cross-listed with ESCI 450. Offered Fall. Instructor(s): Jones.

**CEVE 451 ANALYSIS OF ENVIRONMENTAL DATA (3)**

Introduction to data display, statistical methods, system stimulation, and geostatistics for environmental scientists. The course will emphasize the application of these techniques to real and stimulated environmental problems. The lab will involve extensive computer use and the completion of a major individual project on a topic selected by the student. Cross-listed with ESCI 451. Limited enrollment. Offered Fall. Instructor(s): Jones.

**CEVE 452 URBAN TRANSPORTATION SYSTEMS (3)**

Survey of operation characteristics of transport modes the elements of transportation planning, and the design of stationary elements. Offered Spring. Instructor(s): Sedlak.

**CEVE 453 GEOGRAPHIC INFORMATION SCIENCE (3)**

Introduction to geographic information systems (GIS) technology, mapping sciences, and spatial analysis. The course will include extensive computer use and the completion of a major individual project on a topic selected by the student. Cross-listed with ESCI 454. Offered Fall. Instructor(s): Sawyer.

**CEVE 454 COMPUTATIONAL FLUID MECHANICS (3)**

Fundamental concepts of finite element methods in fluid mechanics, including spatial discretization and numerical integration in multi-dimensions, time-integration, and solution of nonlinear ordinary differential equation systems. Advanced numerical stabilization techniques designed for fluid mechanics problems. Strategies for solution of complex, real-world problems. Topics in large-scale computing, parallel processing, and visualization. Cross-listed with BIOE 454, MECH 454. Graduate/Undergraduate version: CEVE 554. Offered Fall. URL: [www.nems.rice.edu/TAFSM/MECH 454/](http://www.nems.rice.edu/TAFSM/MECH 454/). Instructor(s): Tezduyar.

**CEVE 470 BASIC SOIL MECHANICS (4)**

Index and classification properties of soil including soil classification systems; clay minerals and soil structure; compaction theory; engineering behavior and properties of soils including permeability, compressibility and strength; design considerations. Required for B.S.C.E. Offered Fall. Instructor(s): Cibor.

**CEVE 479 ENGINEERING PROJECT MANAGEMENT (3)**

Systems approach to project management, project life cycle and management methodologies, success factors, project planning, network scheduling techniques, pricing and cost control, risk management, global context, and recent advancements in project management. Case studies. Graduate/Undergraduate version: CEVE 505. Repeatable for Credit. Offered Fall. Instructor(s): Durrani.

**CEVE 480 SENIOR DESIGN (4)**

The capstone design course will provide senior engineering students with a complete design experience including fundamental design issues in the major areas of the curriculum, small team experiences, project proposals, progress reports and presentations, design software and computations, major report writing, and a final presentation to the CEE faculty. An established local firm will assist in teaching practical design methods and consultation with other faculty is required as part of the overall experience. Limited enrollment. Instructor(s): Ward.

**CEVE 490 SPECIAL STUDY AND RESEARCH (1 TO 12)**

Open to environmental science or engineering majors with permission of instructor. Written report required. Cross-listed with ENST 490. Limited enrollment. Offered Fall. Instructor(s): Duenas-Osorio.

**CEVE 492 RELIABILITY OF COMPLEX URBAN SYSTEMS (3)**

To introduce concepts of graph theory and optimization for characterizing complex networked systems; to study probabilistic tools for predicting network failure modes given natural hazards or attacks; and to quantify the effects of network interdependencies and mitigation actions. Complex systems apply to the structure and dynamics of civil, mechanical, electrical and bioengineering networks. The graduate level course includes advanced exercises in homework and exams as well as a research-oriented final project. Repeatable for Credit. URL: [www.ruf.rice.edu/~lad1/ceve592](http://www.ruf.rice.edu/~lad1/ceve592).

**CEVE 496 OFFSHORE AND MARINE SYSTEMS (3)**

Introduction to offshore and marine systems, structures, drillstrings, marine risers, fluid forces, hydrodynamic forces, wien and earthquake forces, materials, fatigue, fracture, corrosion, health monitoring, safety, innovative systems, risk and reliability. Limited enrollment. Offered Fall. Instructor(s): Nagarajaiah.

**CEVE 499 SPECIAL PROBLEMS (1)**

Study of selected topics including individual investigations special lectures, and seminars. Offered upon mutual agreement of faculty and student. Repeatable for Credit. Limited enrollment. Instructor(s): Alvarez.

**CEVE 500 ADVANCED MECHANICS OF MATERIALS (3)**

Advanced topics in solid mechanics and strength of materials including energy methods, principle of virtual work, pressure vessels, beam vibrations, sound waves in solids, buckling, aspects of elasticity theory and fracture mechanics with application to the design of reliable structures. Cross-listed with MECH 500. Graduate/Undergraduate version: CEVE 400. Offered Spring.

**CEVE 505 ENGINEERING PROJECT MANAGEMENT (3)**

Systems approach to project management, project life cycle and management methodologies, success factors, project planning, network scheduling techniques, pricing and cost control, risk management, global context, and recent advancements in project management. Case studies. Graduate/Undergraduate version: CEVE 479. Offered Fall. Instructor(s): Durrani.

**CEVE 506 GLOBAL ENVIRONMENTAL LAW AND SUSTAINABLE DEVELOPMENT (3)**

Examination of emerging trends toward sustainable development and global environmental protection. Includes international treaties on management of the oceans, global warming, ozone depletion, biodiversity and development pattern; impact of treaties such as NAFTA and GATT. Extra work required. Graduate/Undergraduate version: CEVE 306. Must be enrolled in one of the following Level(s): Graduate. Limited enrollment. Offered alternate years. Instructor(s): Blackburn.

**CEVE 511 ATMOSPHERIC CHEMISTRY AND PHYSICS (3)**

Study of the principal chemical and physical processes affecting gases and particles in the atmosphere. Overview of the atmospheric transport, transformation and dispersion of air pollutants on the urban, regional and global scale; atmospheric photochemistry and tropospheric ozone formation; influence of meteorology on air pollution; stratospheric chemistry and global climate change; interactions between gases and particles; characterization; chemical composition and size distributions of atmospheric particles. Limited enrollment. Offered Spring. Instructor(s): Fraser.

**CEVE 512 HYDROLOGIC DESIGN LAB (3)**

Use of Geographic Information Systems (GIS) and design of GIS-developed hydrologic models commonly applied in the water resources field. The course covers principles and operation of the ArcView/ArcGIS programs, design and implementation of standard hydrologic and hydraulic models, and the linkage of these models to engineering analysis of current water problems. Limited enrollment. Offered Spring. Instructor(s): Bedient.

**CEVE 513 THEORY OF ELASTICITY (3)**

Advanced topics in the linear and nonlinear theory of elasticity. Cross-listed with MECH 513. Limited enrollment. Offered Fall. Instructor(s): Landis.

**CEVE 516 PLATES AND SHELLS (3)**

Introduction to theories of plates and cylindrical shells with an application to practical problems. Limited enrollment. Offered alternate years. Instructor(s): Veletsos.

**CEVE 518 GROUNDWATER HYDROLOGY AND CONTAMINATION (3)**

Groundwater hydrology, well mechanics, hydraulics. Contaminant issues in aquifer systems, numerical models, of large aquifers. Topics in water resources engineering and aquifer management. Limited enrollment. Offered Fall. Instructor(s): deBlanc.

**CEVE 520 ENVIRONMENTAL REMEDIATION TECHNOLOGIES (3)**

Study of current remediation technologies for soil, water, and air. Includes selection criteria, costs, operating strategies and engineering design. Limited enrollment. Offered alternate years. Instructor(s): Ward; Oubre.

**CEVE 521 STRUCTURAL DYNAMICS I (3)**

Dynamics of force-excited discrete linear systems with applications to design. Limited enrollment. Offered Fall. Instructor(s): Veletsos.

**CEVE 522 STRUCTURAL DYNAMICS II (3)**

Dynamics of force-excited continuous linear systems and ground-excited linear and yielding structures. Fundamentals of earthquake engineering. Limited enrollment. Offered Spring. Instructor(s): Veletsos.

**CEVE 525 STRUCTURAL DYNAMICS III (3)**

Study of special topics in structural dynamics. Includes problems of wave propagation, the response of structures to waves, the dynamics of foundations, and soil-structure and fluid-structure interaction. Limited enrollment. Instructor(s): Veletsos.

**CEVE 526 STRUCTURAL STABILITY (3)**

General analysis of stress and strain, linear elastic, thermo-elastic stress-strain relations. Approximate solutions by energy methods and finite element method. Limited enrollment. Instructor(s): Durrani.

**CEVE 527 COMPUTATIONAL METHODS IN STRUCTURAL MECHANICS (3)**

Introduction to differential and integral formulations, variational principles, weighted residuals, and principle of virtual work. Simple boundary, initial, and eigenvalue problems. Finite element, boundary element, and finite difference methods for structural mechanics. Study of nonlinearities. Computational methods for geometric and material nonlinear analysis. Applications to static and dynamic problems. Programming and use of computer software. Cross-listed with MECH 527. Limited enrollment. Not offered this academic year. Instructor(s): Nagarajiah.

**CEVE 530 CONCRETE BUILDING DESIGN (3)**

Design of reinforced concrete building structures and floor slab systems. Case histories will be discussed. Instructor(s): Haque.

**CEVE 531 BEHAVIOR OF REINFORCED CONCRETE MEMBERS (3)**

Study of moment-curvature relationship for beams and columns biaxially loaded columns, slenderness effects, interaction diagrams, shear and torsion in members, shear wall-frame interaction, and behavior under large load reversals. Includes extensive use of microcomputers. Limited enrollment. Instructor(s): Durrani.

**CEVE 532 PRESTRESSED CONCRETE (3)**

Study of prestressing techniques, prestress losses, deflections, shear and torsion, and the analysis and design of members using microcomputers. Includes composite members, continuous beams, and prestressed slabs. Prerequisite(s): CEVE 407. Instructor(s): Durrani.

**CEVE 533 NANOSCIENCE AND NANOTECHNOLOGY (3)**

An introduction to the basic principles of nanoscience and nanotechnology. Size dependent physical properties of nanoscopic solids will be described using solid-state physics and molecular orbital theory as a foundation. Wet chemical techniques that produce nanoscale materials (e.g. carbon nanotubes, semiconductor and metallic nanocrystals, dendrimers...) will be introduced in the second half of the semester. Cross-listed with CHEM 533. Limited enrollment. Offered Spring. Instructor(s): Colvin.

**CEVE 534 FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT (3)**

Physical and chemical principles governing the fate and transport of contaminants in the aqueous environment, and the applications of such principles in environmental engineering. Emphasis is put on mass transport and transportation processes in natural and engineering systems. Previous course work in fluid mechanics and calculus through differential equations is strongly suggested. Extra work required. For Graduate Students. Graduate/Undergraduate version: CEVE 434. Repeatable for Credit. Instructor(s): Li.

**CEVE 535 PHYSICAL CHEMICAL PROCESSES FOR WATER QUALITY CONTROL (3)**

Principles, modeling and design aspects of physical chemical treatment processes in drinking water, wastewater and groundwater remediation applications. Modern treatment technologies such as membrane separation, advanced oxidation, and photocatalysis will be covered. Offered Spring. Instructor(s): Li.

**CEVE 536 ENVIRONMENTAL BIOTECHNOLOGY (3)**

Theory and application of biochemical processes in environmental engineering. Must be enrolled in one of the following Level(s): Graduate. Pre-requisite(s): CEVE 203 and CEVE 402. Recommended prerequisite(s): CEVE 401. Limited enrollment. Offered Spring. Instructor(s): Alvarez.

**CEVE 540 STEEL BUILDING DESIGN (3)**

Exploration of practical design from conceptual stage to final analysis. Includes design parameters and serviceability limitations. Corequisite(s): CEVE 405. Offered Spring.

**CEVE 550 ENVIRONMENTAL ORGANIC CHEMISTRY (3)**

A course covering parameter estimation methods, thermodynamics, and kinetic needed to predict the fate, transports, and reactivity of organic compounds in air, water, and soils. Topics: volatilization, solubility, sorption, partitioning, diffusion, aquatic reactivity, photochemistry, and transport modeling. Limited enrollment. Offered Spring. Instructor(s): Tomson.

**CEVE 554 COMPUTATIONAL FLUID MECHANICS (3)**

Cross-listed with BIOE 554, MECH 554. Graduate/Undergraduate version: CEVE 454. Limited enrollment. Offered Fall. URL: [www.mems.rice.edu/TAFSM/MECH 554/](http://www.mems.rice.edu/TAFSM/MECH%20554/). Instructor(s): Tezduyar.

**CEVE 570 FOUNDATION ENGINEERING (3)**

Subsurface exploration methods and techniques; lateral earth pressures and design of retaining walls; bearing capacity and shallow foundation design; settlement considerations; design of deep foundations; temporary excavations and dewatering. Pre-requisite(s): CEVE 470. Limited enrollment. Offered Spring. Instructor(s): Cibor.

**CEVE 576 STRUCTURAL DYNAMIC SYSTEMS AND CONTROL (3)**

Elements of linear systems and control theory, transform methods, state space methods, feedback control, and Lyapunov's method. Analytical modeling of structures, control algorithms, and response to dynamic loading. Base isolation, smart materials and devices, sensors, structural control applications, monitoring, and case studies. Cross-listed with MECH 576. Pre-requisite(s): CEVE 521 or MECH 502 and CEVE 527. Limited enrollment. Offered Spring.

**CEVE 580 MOLECULAR BIOLOGY METHODS (3 TO 4)**

This course is designed for students not familiarized with molecular biology to develop an in depth understanding of the basic principles and methodologies of modern molecular biology applied to the field of Environmental Engineering. This intense lecture/laboratory course will introduce the student with qualitative and quantitative analysis using modern molecular techniques and methodologies that are becoming essential for assessment of environmental samples.

**CEVE 590 M.E.E. AND M.E.S. SPECIAL STUDY AND RESEARCH (3)**

Independent investigation of a specific topic or problem in environmental engineering under the direction of a selected faculty member. Preparation of a formal report and oral presentation of results are required. Offered Fall & Spring.

**CEVE 592 RELIABILITY OF COMPLEX URBAN SYSTEMS (3)**

To introduce concepts of graph theory and optimization for characterizing complex networked systems; to study probabilistic tools for predicting network failure modes given natural hazards or attacks; and to quantify the effects of network interdependencies and mitigation actions. Complex systems apply to the structure and dynamics of civil, mechanical, electrical and bioengineering networks. The graduate level course includes advanced exercises in homework and exams as well as research-oriented final project. Repeatable for Credit. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~lad1/ceve592](http://www.ruf.rice.edu/~lad1/ceve592). Instructor(s): Duenas-Osorio.

**CEVE 596 OFFSHORE AND MARINE SYSTEMS (3)**

Introduction to offshore and marine systems, structures, drillstrings, marine risers, fluid forces, hydrodynamic forces, wind and earthquake forces, materials, fatigue, fracture, corrosion, health monitoring, safety, innovative systems, risk and reliability. Limited enrollment. Offered Fall. Instructor(s): Nagarajah.

**CEVE 601 SEMINAR (1)**

Continuing seminar on environmental research. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Ward.

**CEVE 602 SEMINAR (1)**

See CEVE 601. Repeatable for Credit. Offered Spring. Instructor(s): Ward.

**CEVE 611 ADVANCED TOPICS IN AIR POLLUTION (3)**

Advanced topics in atmospheric chemistry, air pollutant formation and transport, and photochemical and meteorological modeling. Instructor permission required. Limited enrollment. Instructor(s): Cohan.

**CEVE 630 MEMBRANE PROCESSES AND SPECIAL TOPICS IN COLLOID AND NANO CHEMISTRY (3)**

Fundamentals of membrane processes, theory and methods for characterizing aquasols, particle transport in porous media and simple flows, particle aggregation, aggregate and deposit morphology, and other special topics. Must be in one of the following Classification(s): Graduate. Offered Spring. Instructor(s): Li.

**CEVE 635 ADVANCED TOPICS: WATER CHEMISTRY (1 TO 12)**

Formal lecture and assigned reading in topics such as redox kinetics and thermodynamics, absorption and desorption, and the associated mathematics. An advanced topics course. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Tomson.

**CEVE 636 ADVANCED TOPICS IN BIOREMEDIATION (3)**

Basic principles of Microbial Physiology, Metabolisms, Stoichiometry, Thermodynamics and Kinetics applied to the selection, design and performance evaluation of engineered and intrinsic bioremediation systems. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Alvarez.

**CEVE 640 ADVANCED TOPICS IN ENVIRONMENTAL ENGINEERING SCIENCES (1 TO 12)**

Special topics in Graduate Study. Offered Fall.

**CEVE 641 ADVANCED TOPICS IN ENVIRONMENTAL ENGINEERING (1 TO 12)**

Advanced topics in Graduate Study. Offered Spring.

**CEVE 651 M.S. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall.

**CEVE 652 M.S. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Spring.

**CEVE 654 ADVANCED COMPUTATIONAL MECHANICS (3)**

Advanced topics in computational mechanics with emphasis on finite element methods and fluid mechanics. Stabilized formulations. Fluid-particle and fluid-structure interactions and free surface and two-fluid flows. Interface-tracking and interface-capturing techniques, space-time formulations, and mesh update methods. Enhanced discretization and solution techniques. Iterative solution methods, matrix-free computations, and advanced preconditioning techniques. Cross-listed with BIOE 654, MECH 654. Prerequisite(s): CEVE 554 or permission of instructor. Offered Spring. Instructor(s): Tezduyar.

**CEVE 678 ADVANCED STOCHASTIC MECHANICS (3)**

Nonlinear random vibrations, Statistical Linearization, ARMA filters modeling, Monte Carlo Simulation, Wiener-Volterra series, time-variant structural reliability, and Stochastic Finite Elements are presented from a perspective of usefulness to aerospace, civil, marine, and mechanical applications. Cross-listed with MECH 678.

**CEVE 679 APPLIED MONTE CARLO ANALYSIS (3)**

Probability density and power spectrum based simulation concepts and procedures are discussed. Scalar and vectorial simulation are addressed. Spectral decomposition and digital filter algorithms are presented. Applications from aerospace, earthquake, marine, and wind engineering, and from other applied science disciplines are included. Cross-listed with MECH 679. Limited enrollment. Offered Fall. Instructor(s): Spanos.

**CEVE 699 SPECIAL PROBLEMS (3)**

Study of selected topics including individual investigations under the direction of a member of the civil engineering faculty. Offered upon mutual agreement of faculty and student. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Duenas-Osorio.

**CEVE 800 PH.D. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall.

**CEVE 801 PH.D. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Spring.

**CHBE (CHEMICAL & BIOMOLECULAR ENG)****School of Engineering/Chemical & Biomolecular Engineering****CHBE 100 INTRODUCTION TO CHEMICAL AND BIOMOLECULAR ENGINEERING (1)**

A series of lectures for freshman that outline how chemical and biomolecular engineers tackle today's major energy, health, environmental and economic challenges by working to provide sustainable and affordable energy, by designing new materials, biological products or medical therapeutics, and by developing production methods that are friendly to our environment. Offered Spring. Instructor(s): Zygourakis; Cox.

**CHBE 281 ENGINEERING SUSTAINABLE COMMUNITIES (3)**

Students will work in teams to develop sustainable solutions for energy or environmental problems affecting our Houston and Rice communities. Emphasis will be placed on the integration of engineering fundamentals with societal issues, environmental and safety considerations, sustainability and professional communications. Prerequisites: Introductory Engineering Courses, or Permission of Instructor. Cross-listed with ENST 281.

**CHBE 301 CHEMICAL ENGINEERING FUNDAMENTALS (3)**

Use of basic mathematical concepts and computer tools, physical laws, stoichiometry and the thermodynamic properties of matter to obtain material and energy balances for steady and unsteady state systems. Required for sophomores intending to major in chemical engineering. Instructor(s): Biswal.

**CHBE 303 COMPUTER PROGRAMMING IN CHEMICAL ENGINEERING (2)**

An introduction to computer programming for chemical engineering applications using MATLAB and FORTRAN.



**CHBE 305 COMPUTATIONAL METHODS IN CHEMICAL ENGINEERING (3)**

Introduction to modern practice and chemical engineering applications of scientific computing: linear algebra (review); computer-aided solution of systems of linear equations (direct, iterative); evaluation of integrals; systems of nonlinear algebraic equations; systems of ordinary differential equations; one-dimensional boundary value problems; stability and accuracy of computational methods; computational software libraries. Principles illustrated through chemical engineering examples. Pre-requisite(s): CHBE 301 and CHBE 303. Offered Spring. Instructor(s): Mantzaris.

**CHBE 343 CHEMICAL ENGINEERING LAB I (3)**

Experiments demonstrating principles presented in core chemical engineering courses. Pre-requisite(s): CHBE 390 and CHBE 401 and CHBE 412. Offered Spring. Instructor(s): Cox.

**CHBE 390 KINETICS AND REACTOR DESIGN (4)**

General areas that are covered in this course are (1) principles of chemical kinetics; (2) analysis of reaction rate data; (3) heterogeneous catalysis; (4) ideal reactor design and sizing; and (5) heat effects in reactor designs. Pre-requisite(s): CHBE 301 and CHBE 303 and CHBE 305 and MATH 211 and MATH 212. Offered Fall. Instructor(s): Wong.

**CHBE 401 TRANSPORT PHENOMENA I (3)**

Fundamental principles of heat, mass, and momentum transport applied to the continuum; analysis of macroscopic physical systems based on the continuum equations; applications in chemical engineering practice. Pre-requisite(s): CHBE 411 and CHBE 305 and MATH 211 and MATH 212 and PHYS 101 and PHYS 102. Offered Fall. Instructor(s): Miller.

**CHBE 402 TRANSPORT PHENOMENA II (3)**

Continuation of CHBE 401. Emphasis on energy and mass transport applied to the continuum. Prerequisite(s): CHBE 401 and (CAAM 336 or MATH 381). Offered Spring. Instructor(s): Gonzalez.

**CHBE 403 DESIGN FUNDAMENTALS (4)**

Product and process design fundamentals. Economic analysis. Use of modern simulation tools for chemical engineering design. Pre-requisite(s): CHBE 390 and CHBE 402 and CHBE 412 and MECH 211. Offered Fall. Instructor(s): Cox.

**CHBE 404 PRODUCT AND PROCESS DESIGN (4)**

Strategies for optimal product and process design. Industrial economic principles. Special process or product design projects in small groups. Pre-requisite(s): CHBE 403. Offered Spring. Instructor(s): Cox.

**CHBE 411 THERMODYNAMICS I (3)**

Development and application of the first and second laws of thermodynamics. Pre-requisite(s): CHBE 301 and CHBE 303. Offered Spring. Instructor(s): Robert.

**CHBE 412 THERMODYNAMICS II (3)**

Advanced treatment of chemical and phase equilibria in multi-component systems. Includes a detailed study of nonideal solutions. Pre-requisite(s): CHBE 411. Offered Fall. Instructor(s): Chapman.

**CHBE 420 BIOSYSTEMS TRANSPORT AND REACTION PROCESSES (3)**

Application of the basic principles of transport and reaction to analyze momentum, heat, and mass transport, and reaction processes in the human body. Includes mathematical modeling to describe physiologic function, to understand pathological conditions, and to design bioartificial organs with emphasis on the quantification of biomedical systems in relation to underlying molecular mechanisms and cellular behavior. Cross-listed with BIOE 420. Offered Fall. Instructor(s): Mikos.

**CHBE 443 CHEMICAL ENGINEERING LAB II (3)**

Experiments demonstrating principles presented in core chemical engineering courses, operations, and thermodynamic principles as covered in CHBE 401, 402, 411. Pre-requisite(s): CHBE 343 and CHBE 402. Offered Fall. Instructor(s): Cox.

**CHBE 460 BIOCHEMICAL ENGINEERING (3)**

Design, operation, and analysis of processes in the biochemical industries. Topics include enzyme kinetics, cell growth kinetics, energetics, recombinant DNA technology, microbial, tissue and plant cell cultures, bioreactor design and operation, down stream processing. Cross-listed with BIOE 460. Offered Spring. Instructor(s): San.

**CHBE 470 PROCESS DYNAMICS AND CONTROL (3)**

Modeling of dynamic processes. Response of uncontrolled systems. Transfer functions. Feedback controllers; response and stability of controlled systems; frequency response. Design of feedback controllers. Cascade, feed forward and multivariable control systems. Introduction to computer control. Use of simulators to design feedback controllers. Required for B.S. majors in chemical engineering. Prerequisite(s): CHBE 390 and CHBE 402 and CHBE 412. Offered Fall. Instructor(s): Pasquali.

**CHBE 500 UNDERGRADUATE RESEARCH (1 TO 6)**

Independent investigation of a specific topic or problem in modern chemical engineering research under the direction of a selected faculty member. Department permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Robert.

**CHBE 501 FLUID MECHANICS AND TRANSPORT PROCESSES (3)**

Advanced study in fluid mechanics and transport processes including analytical and numerical approximation methods, boundary layer theory, and potential flow theory. Offered Fall. Instructor(s): Hirasaki.

**CHBE 540 STATISTICAL MECHANICS (3)**

A development of the principles of statistical mechanics with applications. Not offered this academic year. Instructor(s): Robert.

**CHBE 560 INTERFACIAL PHENOMENA (3)**

Interfacial tension, wetting and spreading, contact angle hysteresis, interaction between colloid particles, stability of interfaces, flow and transport near interfaces. Not offered this academic year. Instructor(s): Miller.

**CHBE 571 FLOW AND TRANSPORT THROUGH POROUS MEDIA I (3)**

Study of the geology, chemistry, and physics of multi-component, multiphase fluids in porous media. Includes hydrostatic and hydrodynamic properties of fluids in soils and rocks and the simulation of fundamental transport processes in one dimension. Not offered this academic year. Instructor(s): Hirasaki.

**CHBE 590 KINETICS, CATALYSIS, AND REACTION ENGINEERING (3)**

Review of kinetics and reactor design equations; heterogeneous catalysis; catalyst preparation, characterization, testing; catalytic reaction mechanisms; diffusion and reaction in catalyst pellets; conservation equations; reactor analysis. Offered Spring. Instructor(s): Wong.

**CHBE 597 POLYMER SYNTHESIS, SOFT NANOMATERIALS AND NANOCOMPOSITES (3)**

The course will cover methods of characterization and some basic synthetic polymer methods (step growth and chain growth approaches). New synthetic polymer methods will be presented including ATRP, ADMET, ROMP, metallocene catalysts and the development of flame retardant polymer blends. Carbon-carbon composites will be discussed along with the functionalization of carbon nanotubes and their use in nanocomposites. Cross-listed with CHEM 597, MSCI 597. Pre-requisite(s): CHEM 211 and CHEM 212. Repeatable for Credit. Offered Spring. Instructor(s): Tour; Barrera.

**CHBE 600 MASTER OF CHEMICAL ENGINEERING RESEARCH (1 TO 12)**

Independent investigation of a topic or problem in modern chemical engineering research under the direction of a selected faculty member. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**CHBE 602 PHYSICO-CHEMICAL HYDRODYNAMICS (3)**

Topics in hydrodynamics including areas such as waves on liquid surfaces, convection and diffusion in liquids, motion of drops and bubbles, and electrophoresis. Offered Spring. Instructor(s): Miller.

**CHBE 603 RHEOLOGY (3)**

Calculus and time derivatives of directed quantities. Elastic solid, Newtonian liquid. Shear and extensional flows. Linear viscoelasticity. Non-linear viscoelasticity: rate- and time-dependent shear and extensional viscosity, normal stresses in shear. Elementary theories of non-linear viscoelastic behavior. Isotropy, objectivity, frame-indifference. Shear and extensional rheometry. Special topics: thermodynamics of microstructured materials; fine-grained theories of polymer dynamics; computational rheology. Not offered this academic year. Instructor(s): Pasquali.

**CHBE 611 ADVANCED TOPICS-THERMODYNAMICS (3)**

An advanced treatment of the thermodynamics of pure and multi-component systems. Topics range from classical thermodynamics to a discussion of modern developments, and include an introduction to statistical thermodynamics. Offered Fall. Instructor(s): Robert.

**CHBE 615 APPLICATION OF MOLECULAR SIMULATION AND STATISTICAL MECHANICS (3)**

Introduction to molecular simulation techniques and applications of statistical mechanics-based theory to engineering problems. Projects involve topics of current research interest. Students are expected to know thermodynamics and to have had some introduction to statistical mechanics. Not offered this academic year. Instructor(s): Chapman.

**CHBE 620 TISSUE ENGINEERING (3)**

This course will focus on cell-cell interactions and the role of the extracellular matrix in the structure and function of normal and pathological tissues. Includes strategies to regenerate metabolic organs and repair structural tissues, as well as cell-based therapies to deliver proteins and other therapeutic drugs, with emphasis on issues related to cell and tissue transplantation such as substrate properties, angiogenesis, growth stimulation, cell differentiation, and immunoprotection. Cross-listed with BIOE 620. Offered Spring. Instructor(s): Mikos.

**CHBE 630 CHEMICAL ENGINEERING OF NANOSTRUCTURED MATERIALS (3)**

Overview of materials with structural features on the nanometer scale. Discussion of general concepts of synthesis, characterization and applications. Highlight advances found in recent literature. Not offered this academic year. Instructor(s): Wong.

**CHBE 640 METABOLIC ENGINEERING (3)**

Principles of metabolic engineering: overview of biochemical pathways; kinetics and thermodynamics of metabolic networks; genetic engineering and molecular biology tools; metabolic flux analysis using stoichiometric and labeling techniques; metabolic control analysis. Metabolic engineering in the postgenomic era: functional genomics and systems biology. Emerging applications: chemicals from biorenewables; food ingredients; health and disease. Offered Fall. Instructor(s): Gonzalez.

**CHBE 661 GRADUATE SEMINAR (1)**

Repeatable for Credit. Offered Fall.

**CHBE 662 GRADUATE SEMINAR (1)**

Repeatable for Credit. Offered Spring.

**CHBE 671 FLOW AND TRANSPORT THROUGH POROUS MEDIA II (3)**

Calculation of multi-component-multiphase transport in one to three dimensions using finite difference methods. Includes development of multidimensional models of systems and representation and estimation of geological heterogeneity. Offered Spring. Instructor(s): Hirasaki.

**CHBE 692 NUMERICAL METHODS FOR DIFFERENTIAL EQUATIONS IN ENGINEERING AND BIOLOGY (3)**

The class focuses on the numerical analysis of various times integration techniques for ordinary differential equations, as well as spatial and temporal discretization methods for hyperbolic and parabolic partial differential equations that describe processes in engineering and biology. Homework and projects aim at the comparative evaluation of the various schemes discussed in class. Recommended prerequisite(s): Knowledge of a programming language (Fortran preferably) elementary P.D.E.s, basic concepts of calculus. Offered Fall. Instructor(s): Mantzaris.

**CHBE 700 M.S. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall &amp; Spring.

**CHBE 720 SPECIAL TOPICS IN CHEMICAL ENGINEERING I (1 TO 15)**

A course that covers various special topics in chemical engineering. Offered at irregular intervals on demand. Instructor permission required. Repeatable for Credit. Not offered this academic year.

**CHBE 760 BAYLOR/RICE MD/PHD PROGRAM (1 TO 15)**

Department permission required. Repeatable for Credit. Offered Fall &amp; Spring.

**CHBE 800 GRADUATE RESEARCH (1 TO 15)**

Repeatable for Credit. Offered Fall &amp; Spring.

**CHBE 801 SPECIAL TOPICS IN CHEMICAL ENGINEERING II (1)**

Summer internship in an area related to thesis research or professional broadening. Permission of thesis advisor and department chair required. Repeatable for Credit.

**CHEM (CHEMISTRY)****School of Natural Sciences/Chemistry****CHEM 121 GENERAL CHEMISTRY I (4)**

Introduction of chemical phenomena emphasizing problems and methods in Chemistry. Either CHEM 121 or CHEM 151 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Students must also register for CHEM 123 General Chemistry Laboratory I. Corequisite(s): CHEM 123. Offered Fall.

**CHEM 122 GENERAL CHEMISTRY II (4)**

A continuation of CHEM 121. Either CHEM 122 or CHEM 152 may be taken as prerequisites for higher study in chemistry, but only one may be taken for credit. Students must also register for CHEM 124 General Chemistry Laboratory II. Pre-requisite(s): CHEM 121 or CHEM 151. Corequisite(s): CHEM 124. Offered Spring.

**CHEM 123 GENERAL CHEMISTRY LABORATORY I (0)**

Required laboratory component of CHEM 121. Students must also register for CHEM 121. Corequisite(s): CHEM 121. Offered Fall. Instructor(s): McHale.

**CHEM 124 GENERAL CHEMISTRY LABORATORY II (0)**

Required laboratory component of CHEM 122. Students must also register for CHEM 122. Corequisite(s): CHEM 122. Offered Spring. Instructor(s): McHale.

**CHEM 151 HONORS CHEMISTRY I (4)**

An accelerated introduction to chemical phenomena emphasizing principles and theories in chemistry. Recommended strongly for students who plan to major in chemistry or have a strong high school background. Students must also register for CHEM 153, which is laboratory that meets once per week for 2.5 hours. Either CHEM 121 or CHEM 151 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Corequisite(s): CHEM 153. Recommended prerequisite(s): high school chemistry and physics. Offered Fall.

**CHEM 152 HONORS CHEMISTRY II (4)**

A continuation of CHEM 151. Students must also register for CHEM 154, which is a laboratory that meets once per week for 2.5 hours. Either CHEM 122 or CHEM 152 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Pre-requisite(s): CHEM 151. Corequisite(s): CHEM 154. Offered Spring.

**CHEM 153 HONORS CHEMISTRY LABORATORY I (0)**

Required laboratory component of CHEM 151. Students must also register for CHEM 151. Corequisite(s): CHEM 151. Offered Fall. Instructor(s): McHale.

**CHEM 154 HONORS CHEMISTRY LABORATORY II (0)**

Required laboratory component of CHEM 152. Students must also register for CHEM 152. Corequisite(s): CHEM 152. Offered Spring. Instructor(s): McHale.

**CHEM 157 LABORATORY SKILLS REVIEW I (0)**

A laboratory refresher course for students who received AP credit for CHEM 121, 122. Instructor permission required. Offered Fall. Instructor(s): McHale.

**CHEM 158 LABORATORY SKILLS REVIEW II (0)**

Continuation of CHEM 157. Instructor permission required. Offered Spring. Instructor(s): McHale.

**CHEM 176 THE CHEMISTRY OF ART (3)**

The chemistry of the materials and methods used to create, conserve and authenticate art objects will be presented. Topics will include sculpture, painting, photography, textiles, jewelry, furniture, etc. Taught in conjunction with the Conservation Department and Staff of the MFAH. Some classes will be held at the MFAH or HMNS. Cross-listed with ARTS 176. Offered Spring.

**CHEM 211 ORGANIC CHEMISTRY (3)**

Organic chemistry of aliphatic and aromatic compounds with emphasis on structure, bonding, and reaction mechanisms. Either CHEM 211 or CHEM 251 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Pre-requisite(s): CHEM 122 or CHEM 152. Offered Fall.

**CHEM 212 ORGANIC CHEMISTRY (3)**

Continuation of CHEM 211 with a greater emphasis on the chemistry of various functional groups. Either CHEM 212 or CHEM 252 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Pre-requisite(s): CHEM 211 or CHEM 251. Offered Spring.

**CHEM 215 ORGANIC CHEMISTRY LAB (2)**

Synthesis, purification, and characterization of organic compounds. Experiments related to topics covered in CHEM 211, 212. Includes identification of unknown organic compounds. (One-hour lecture precedes each lab). One lab per week. Offered Spring. Instructor(s): McHale.

**CHEM 217 ORGANIC LABORATORY FOR CHEMICAL ENGINEERS (1)**

Organic laboratory designed for chemical engineering majors. Emphasis placed on the synthesis and the characterization of organic compounds. This laboratory does not satisfy requirements for science majors or premedical students. Offered Fall. Instructor(s): McHale.

**CHEM 235 NANOTECHNOLOGY: CONTENT AND CONTEXT (3)**

Nanotechnology is science and engineering resulting from the manipulation of matter's most basic building blocks: atoms and molecules. This course is designed for humanities and science students who want to explore the content of nanotechnology, (e.g., the methods of visualization, experimentation, and manufacture, and technical feasibility) with the social context of nanotechnology (issues of ethics, regulation, risk assessment, history, funding, intellectual property, controversy and conflict). Preference will be given to freshmen and sophomore students. Register for CHEM 235 to receive Group 3 distribution credit; register for ANTH 235 to receive Group 2 distribution credit. You may receive credit only for one group, not both. Cross-listed with ANTH 235, HIST 237. Limited enrollment. Offered Fall.

**CHEM 251 HONORS ORGANIC CHEMISTRY I (3)**

Chemistry 251 HONORS is a 3-credit course with a limited enrollment. This course is specifically designed for chemistry majors and any other students interested in a deeper study of the subject. Subjects will include current topics in organic chemistry along with in-depth descriptions of mechanisms and their implications, discussions of industrial and pharmaceutical chemistry and ethical questions that often arise with chemical use. Advanced problem solving sessions will be included. Either CHEM 211 or CHEM 251 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Pre-requisite(s): CHEM 122 or CHEM 152. Offered Fall.

**CHEM 252 HONORS ORGANIC CHEMISTRY II (3)**

Chemistry 252 HONORS is a continuation of CHEM 251 with a limited enrollment, specifically designed for chemistry majors plus any other students interested in a deeper study of the subject. See CHEM 251 for description of topics. Advance problem sessions will be included. Either CHEM 212 or CHEM 252 may be taken as a prerequisite for higher study in chemistry, but only one of these may be taken for credit. Pre-requisite(s): CHEM 251 or CHEM 211. Offered Spring.

**CHEM 311 PHYSICAL CHEMISTRY (3)**

An introduction to the fundamental principles of physical chemistry, including quantum chemistry, chemical bonding and molecular spectroscopy. Offered Fall.

**CHEM 312 PHYSICAL CHEMISTRY (3)**

An introduction to the principles of thermodynamics, statistical thermodynamics, kinetic theory of gases, chemical kinetics and the statistical mechanics. Offered Spring.

**CHEM 325 ENVIRONMENTAL GEOCHEMISTRY (3)**

Theories and problems of chemical hazards in the environment due to natural processes, with emphasis on low-temperature aqueous systems. Offered Fall. Instructor(s): Lutghe.

**CHEM 351 INTRODUCTORY MODULE IN EXPERIMENTAL CHEMISTRY I (1)**

Experiments illustrating techniques in synthetic inorganic chemistry and instrumental methods of analysis. Required for chemistry majors. Offered in the first half of the semester. Freshman may take the course with permission from instructor. Offered Fall.

**CHEM 352 INTRODUCTORY MODULE IN EXPERIMENTAL CHEMISTRY II (1)**

Experiments illustrating techniques in synthetic organic chemistry and instrumental methods of analysis. Required for chemistry majors. Offered in the second half of the semester. Offered Fall.

**CHEM 353 INTRODUCTORY MODULE IN ANALYTICAL METHODS (1)**

Experiments illustrating techniques in analytical chemistry, data analysis, data precision and accuracy. Required for Chemistry majors. Offered in the first half of the semester. Offered Spring.

**CHEM 360 INORGANIC CHEMISTRY (3)**

Survey of the periodic table; atomic and molecular structure; bonding in covalent, ionic, and electron deficient systems; thermochemical principles and experimental techniques for analysis, structure determination, and synthesis. Offered Spring.

**CHEM 372 ADVANCED MODULE IN THE SYNTHESIS AND CHARACTERIZATION OF FULLERENE COMPOUNDS (1)**

Derivatives of C<sub>60</sub> fullerene will be synthesized and characterized by spectroscopic techniques. Offered the first half of the semester. Offered Spring.

**CHEM 373 ADVANCED MODULE IN THE CHEMISTRY AND PROPERTIES OF FULLERENE COMPOUNDS (1)**

A mixture of fullerenes is extracted, separated, and purified. Spectroscopic, kinetic, and electrochemical properties of C<sub>60</sub> and C<sub>70</sub> are then measured and interpreted. Offered second half of the semester. Prerequisite(s): CHEM 351 and CHEM 352. Offered Spring.

**CHEM 374 ADVANCED MODULE IN SYNTHETIC CHEMISTRY (1)**

Advanced techniques in organic synthesis are presented. Offered the second half of the semester. Prerequisite(s): CHEM 351 and CHEM 352 and CHEM 353. Offered Spring.

**CHEM 375 ADVANCED MODULE IN NANOCHEMISTRY (1)**

Students explore synthesis and structure of nanoparticles and their physical characterization. Offered in the second half of the semester. Offered Fall.

**CHEM 378 ADVANCED MODULE IN PLANT NATURAL PRODUCTS BIOCHEMISTRY (1)**

Bioorganic lab module combining molecular biology to express plant terpene synthases in microbial systems with product structural analysis using GC-MS and NMR. Final lab reports will be in the format of a scientific publication. Pre-requisite(s): CHEM 211 or BIOS 311. Instructor permission required. Offered Spring. Instructor(s): Matsuda; Bartel.

**CHEM 381 ADVANCED MODULE IN EQUILIBRIUM PHYSICAL CHEMISTRY (1)**

An introduction to experimental physical chemistry, with an emphasis on experiments that probe systems at equilibrium. The labs are offered either M, T, W or TH from 1-6pm every other week. Offered the first half of the semester. Offered alternate years.

**CHEM 382 ADVANCED MODULE IN KINETIC PHYSICAL CHEMISTRY II (1)**

An introduction to computer data acquisition in experimental physical chemistry, with an emphasis on experiments that probe systems evolving in time. Offered in the first half of the semester. The labs are offered either M, T, W, or TH from 1-6pm every other week. Corequisite(s): CHEM 311. Offered alternate years.

**CHEM 384 ADVANCED MODULE INSTRUMENTAL ANALYSIS (1)**

Principles and application of modern instrumental methods to inorganic pharmaceutical, organic, and physical chemistry. Offered in the second half of the semester. Offered Spring.

**CHEM 395 ADVANCED MODULE IN GREEN CHEMISTRY (1)**

Experimental laboratory designed to access the health and environmental impact of chemical processes and the strategies to improve them. Offered in the first half of the semester. Offered Spring.

**CHEM 399 ADVANCED MODULE: EXPERIMENTAL DESIGN (1 TO 3)**

An advanced laboratory module open to exceptional majors to develop laboratory research projects into new advanced modules under the supervision of a chemistry faculty member. Pre-requisite(s): CHEM 351 and CHEM 352 and CHEM 353. Department permission required.

**CHEM 401 ADVANCED ORGANIC CHEMISTRY (3)**

The synthesis of complex organic compounds is described using the basic outline of retrosynthetic analysis. An overview of numerous classical organic and organometallic methods is utilized. Offered Fall.

**CHEM 411 SPECTRAL METHODS IN ORGANIC CHEMISTRY (3)**

Elucidation of organic structures by physical techniques. Interpretation of infrared, ultraviolet, nuclear magnetic resonance, and mass spectra. Offered Fall.

**CHEM 413 NUCLEAR MAGNETIC RESONANCE IN CHEMISTRY (3)**

The intent of this course is to give the student a working knowledge of the applications of modern multidimensional NMR in Biology, Chemistry, and Physiology. The theoretical and fundamental principles of both nuclear magnetic resonance (NMR) spectroscopy and magnetic resonance imaging (MRI) will be covered. Application of both technologies to a number of valuable analytical and diagnostic tools, including functional magnetic resonance imaging (fMRI), diffusion tensor imaging (tractography), hyperpolarization, and high precision anatomical imaging, among others, will be presented. Offered Fall.

**CHEM 415 CHEMICAL KINETICS AND DYNAMICS (3)**

Description and analysis of the rates of unimolecular, bimolecular and composite chemical reactions in gas and solution phases. Both macroscopic kinetics and microscopic reaction dynamics are covered. Pre-requisite(s): CHEM 311 and CHEM 312. Offered Fall.

**CHEM 425 ORGANIC GEOCHEMISTRY (3)**

This course covers the organic geochemistry of the natural environment. Topics include: production, transport, decomposition, and storage of organic matter in the marine and terrestrial environments, use of isotopes to track biogeochemical processes, and natural and perturbed carbon cycle issues, including past and recent climate shifts. Cross-listed with ENST 425, ESCI 425. Offered Spring.

**CHEM 430 QUANTUM CHEMISTRY (3)**

Quantum mechanical principles, atomic structure and chemical bonding. Offered Fall.

**CHEM 435 METHODS OF COMPUTATIONAL QUANTUM CHEMISTRY (1)**

Methods of quantum chemistry will be examined with projects to explore the application of these techniques in solving questions about chemical structure, bonding and reactivity. Counts as an advanced laboratory module. Offered the second half of the semester. Limited enrollment. Offered Spring.

**CHEM 440 ENZYME MECHANISMS (3)**

A survey of organic reactions catalyzed by enzymes, with an emphasis on arrow-pushing mechanisms. Both enzymes that use cofactors and those that do not will be covered. Cross-listed with BIOS 440. Offered alternate years.

**CHEM 442 PRINCIPLES OF MEDICINAL CHEMISTRY I (3)**

The course will describe the relationship between the chemical structure and the biological action of natural and synthetic drug molecules. Emphasis will be placed on the underlying principles of medicinal chemistry as well as specific therapeutic agents. Organization will be according to pharmacological classification with discussion of how chemical properties relate to drug mechanism of action and disposition. Pre-requisite(s): CHEM 212. Offered Fall.

**CHEM 443 PRINCIPLES OF MEDICINAL CHEMISTRY II (3)**

The course will describe the relationships between chemical structure and biological action of drug molecules. Organization will be according to disease state and pharmacological classification with discussion of how chemical properties relate to drug mechanism of action and disposition. Prerequisite(s): CHEM 212. Offered Spring.

**CHEM 445 PHYSICAL ORGANIC CHEMISTRY (3)**

Organic reaction mechanisms, molecular orbitals, reaction kinetics, and linear free energy relationships; substituent, solvent, and isotope effects. Offered Spring.

**CHEM 458 THERMODYNAMICS/KINETICS FOR EARTH SCIENTISTS (3)**

Thermodynamics and kinetics for the special needs of Earth scientists covering the basic concepts with respect to geochemical applications, e.g., equilibrium-nonequilibrium concepts, steady state, delta G dependence of reactions, rate models, etc. Cross-listed with ESCI 458. Offered Fall. Instructor(s): Lutjge.

**CHEM 491 RESEARCH FOR UNDERGRADUATES (1 TO 5)**

Open only to chemistry majors unless approved by the department chair. Written report required. Must be enrolled in one of the following Major(s): Chemistry. Repeatable for Credit. Offered Fall & Spring.

**CHEM 494 UNDERGRADUATE LITERATURE RESEARCH (1 TO 3)**

Students conduct literature research under the direction of a chemistry faculty member. The research project will culminate in a substantial written work describing the results of the project. Department permission required. Offered Fall & Spring.

**CHEM 495 TRANSITION METAL CHEMISTRY (3)**

Structure, bonding and reactivity of coordination and organometallic compounds; ligand field theory; electronic spectroscopy; magnetism; reaction mechanisms; catalysis. Offered Fall.

**CHEM 520 CLASSICAL AND STATISTICAL THERMODYNAMICS (3)**

A review of the principles of classical thermodynamics and an introduction to the theories and methods of statistical thermodynamics with applications to problems in chemistry. Offered Spring.

**CHEM 531 ADVANCED QUANTUM CHEMISTRY (3)**

A hands-on approach to the methods of computational quantum chemistry and their application. Offered Spring.

**CHEM 533 NANOSTRUCTURE AND NANOTECHNOLOGY I (3)**

An introduction to the basic principles of nanoscience and nanotechnology. Size dependent physical properties of nanoscopic solids will be described using solid-state physics and molecular orbital theory as a foundation. Wet chemical techniques that produce nanoscale materials (e.g. carbon nanotubes, semiconductor and metallic nanocrystals, dendrimers...) will be introduced in the second half of the semester. Cross-listed with CEVE 533. Offered Spring.

**CHEM 535 ADVANCED TOPICS IN GEOCHEMISTRY (3)**

Cross-listed with ESCI 535. Offered Fall. Instructor(s): Lutge.

**CHEM 537 BIOPHYSICAL CHEMISTRY (3)**

This course will cover selected modern equipmental and theoretical approaches to biophysical problems. Specifically, protein folding, single molecules and cytoskeleton dynamics will be discussed from theoretical and experimental points of view. Offered alternate years.

**CHEM 543 SECONDARY METABOLISM (3)**

A survey of the biosynthetic pathways leading to the major classes of natural products. Topics covered include the use of radioactive and stable isotopes, the synthesis of labeled organic compounds, mechanistic investigations of secondary metabolic enzymes, and the cloning and characterization of secondary metabolic genes. Cross-listed with BIOS 543. Offered Spring.

**CHEM 544 TRANSITION METALS IN ORGANIC SYNTHESIS (3)**

The use of transition metals for complex organic synthesis is presented. This will include mechanistic implications. Additionally, an overview of main group metal use in organic synthesis is covered. Prerequisite(s): CHEM 211 and CHEM 212. Offered alternate years.

**CHEM 547 SUPRAMOLECULAR CHEMISTRY (3)**

An examination of noncovalent interactions and their impact in biology, chemistry, and engineering. Topics will include self-assembly, molecular recognition, protein folding and structure, nucleic acid structure, polymer organization, crystallization and applications of the above for the design and synthesis of nanostructured materials. Offered Fall.

**CHEM 562 ADVANCED ORGANIC CHEMISTRY II (3)**

Continues in the same vein as CHEM 401 but with emphasis on current methodology and synthesis. It is recommended that CHEM 401 or an equivalent be completed prior to CHEM 562. Offered Spring.

**CHEM 570 CONNECTING NANOSCIENCE TO 9TH GRADE IPC CURRICULUM (0 TO 3)**

Seminar with a team of university faculty to refresh and enhance high school Integrated Physics and Chemistry (IPC) teachers understanding of course material. This material will then be connected to ongoing nanotechnology research to act as a stimulating and effective context for teaching scientific concepts. Instructor permission required. Limited enrollment. Offered Spring.

**CHEM 575 PHYSICAL METHODS IN INORGANIC CHEMISTRY (3)**

A survey course of research techniques used in modern inorganic chemistry. Topics covered will include X-ray diffraction, matrix isolation, mass spectrometry, magnetism, electrochemistry, and various spectroscopies (IR, Raman, UV-Vis, NMR, EPR, XPS, EXAFS, and Mossbauer). Open to undergraduates by special permission only.

**CHEM 595 SPECIAL TOPICS-INORGANIC CHEMISTRY (3)**

Rotation of topics include: solid-state chemistry, organometallic chemistry, bioinorganic chemistry, and single-crystal X-ray diffraction. Open to undergraduates by special permission only. Repeatable for Credit. Offered Spring.

**CHEM 596 CHEMISTRY OF ELECTRONIC MATERIALS (3)**

A review of the chemical processes involved in the manufacture of microelectronic chips, including; crystallization, purification, oxidation, thin film methods, lithography and ceramic processing. Open to undergraduates by special permission only. Cross-listed with MSC1 596.

**CHEM 597 POLYMER SYNTHESIS, SOFT NANOMATERIAL AND NANOCOMPOSITES (3)**

The course will cover methods of characterization and some basic synthetic polymer methods (step growth and chain growth approaches). New synthetic polymer methods will be presented including ATRP, ADMET, ROMP, metallocene catalysts and the development of flame retardant polymer blends. Carbon-carbon composites will be discussed, along with the functionalization of carbon nanotubes and their use in nanocomposites. Cross-listed with CHBE 597, MSC1 597. Pre-requisite(s): CHEM 211 and CHEM 212. Repeatable for Credit. Offered Spring.

**CHEM 600 GRADUATE SEMINAR (1)**

Section 1: BIOLOGICAL CHEMISTRY Section 2: SYNTHETIC AND MECHANISTIC CHEMISTRY Section 3: MATERIALS CHEMISTRY-NANO Section 4: PHYSICAL CHEMISTRY-NANO Section 5: NANOBIOLOGY Section 6: METABOLIC BIOCHEMISTRY Repeatable for Credit. Offered Fall & Spring.

**CHEM 606 EFFECTIVE PRESENTATIONS FOR CHEMISTS (1)**

Students learn to plan effective technical seminars with applications to chemical conferences such as the national and regional meetings of the American Chemical Society, as well as job interview presentations. Open to undergraduates by special permission only.

- CHEM 630 MOLECULAR SPECTROSCOPY AND GROUP THEORY (3)**  
The spectra of simple molecules, including microwave, infrared, visible, ultraviolet, and Raman spectra; introductory aspects of molecular symmetry and group theory; resonance spectroscopy; surface-enhanced spectroscopy. Pre-requisite(s): CHEM 430. Offered alternate years.
- CHEM 700 TEACHING PRACTICUM (2)**  
Open to graduate students in chemistry and only in exceptional circumstances to undergraduates. Repeatable for Credit. Offered Fall & Spring. Instructor(s): McHale.
- CHEM 777 VISITING RESEARCH TRAINEE (0)**
- CHEM 800 GRADUATE RESEARCH (1 TO 15)**  
Repeatable for Credit.
- CHEM 801 REU RESEARCH IN CHEMISTRY (1 TO 3)**

## CHIN (CHINESE)

### School of Humanities/Center for Study of Languages

- CHIN 101 INTRODUCTORY CHINESE I (5)**  
For students with no background in Chinese. Students will learn Pinyin writing system, vocabulary and structure required for basic communicative tasks. Students will learn to write approximately 250 Chinese characters. Chinese culture will be introduced. Weekly laboratory assignment and tutorial participation are required to receive full credit. No prior knowledge of Chinese required. Limited enrollment. Offered Fall & Spring.
- CHIN 102 INTRODUCTORY CHINESE II (5)**  
Continuation of CHIN 101. More attention will be paid to the Chinese characters while conversation skills still receive priority. Weekly laboratory assignment and tutorial participation are required. Students will learn to write approximately 200 Chinese characters and be able to perform communicative tasks appropriate to this range of characters. Pre-requisite(s): CHIN 101, or placement test or permission of instructor. Limited enrollment. Offered Spring.
- CHIN 201 ELEMENTARY CHINESE I (4)**  
Continuation of CHIN 102. Emphasis on reading, writing, and speaking for personal needs. Weekly attendance in the language lab and participation in weekly tutorials are required. Students will be familiar with approximately 300 characters at the end of the course, and able to perform communicative tasks appropriate to this range of characters. Pre-requisite(s): CHIN 102, or placement test or permission of instructor. Limited enrollment.
- CHIN 202 ELEMENTARY CHINESE II (4)**  
Continuation of CHIN 201. Emphasis on developing oral fluency at the sentence level, reading articles, and cultivating a socio-cultural understanding of the Chinese-speaking society. Upon completion, students expected to be able to write approximately 400 characters and perform communicative tasks, surrounding basic personal needs, appropriate to this range of characters. Class conducted primarily in Chinese and a weekly tutorial is required to receive full credit. Pre-requisite(s): CHIN 201, or placement test or permission of instructor. Limited enrollment.
- CHIN 203 INTERMEDIATE CHINESE CONVERSATION (3)**  
Three-week semi-immersion intermediate Chinese course on listening and speaking with minimal emphasis on the learning of characters. Course aims to help students develop oral fluency at the sentence-to-paragraph level and the ability to perform communicative tasks to satisfy various personal and social needs through classroom activities and lab assignments. Intensive conversational course for enhancing aural/oral proficiency or in preparation for internships or study-abroad in Chinese-speaking societies. Course conducted in Chinese. Recommended prerequisite(s): Two semesters of Chinese or permission of the instructor.
- CHIN 211 ACCELERATED ELEMENTARY CHINESE I (4)**  
For students with some background in spoken Chinese but with limited writing ability. Introduces the Chinese writing system and the use of Chinese dictionaries. Students will be familiar with approximately 350 characters at the end of the course, and able to perform communicative tasks appropriate to this range of characters. Limited enrollment.
- CHIN 212 ACCELERATED ELEMENTARY CHINESE II (4)**  
Increasing attention paid to more formal narrative texts. Writing focused on personal needs, with some attention to social correspondence. Students will be familiar with approximately 400 characters at the end of the course, and able to perform communicative tasks appropriate to this range of characters. Prerequisite(s): CHIN 211, or placement test or permission of instructor. Limited enrollment.
- CHIN 215 CLASSICAL CHINESE (3)**  
This course develops students a reading knowledge of classical Chinese through studying selected original passages from the great classic texts of Chinese literature, history and philosophy. The lectures are in English. The understanding of classical Chinese improves reading proficiency and writing skill in modern written language. Pre-requisite(s): CHIN 202 and CHIN 212. Limited enrollment. Offered Fall.



**CHIN 222 AP CREDIT IN CHINESE LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams. This credit counts towards the total credit hours required for graduation.

**CHIN 223 AP CREDIT IN CHINESE LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams. This credit counts toward the total credit hours required for graduation.

**CHIN 301 INTERMEDIATE CHINESE I (4)**

Continuation of CHIN 202, for students whose home language is not Chinese. Oral skills cultivated through discussion after reading narrative texts and writing focused on techniques necessary for satisfying personal and social needs. Upon completion, students expected to be able to write approximately 550 characters and be able to perform communicative tasks appropriate to this range of characters. Pre-requisite(s): CHIN 202, or placement test or permission of instructor. Limited enrollment.

**CHIN 302 INTERMEDIATE CHINESE II (4)**

Continuation of CHIN 301, emphasis on developing oral fluency at the paragraph level and cultivating writing skills as more authentic materials and socio-cultural topics are introduced. Upon completion, students expected to be able to write approximately 800 characters and perform communicative tasks appropriate to this range of characters. Pre-requisite(s): CHIN 301, or placement test or permission of instructor. Limited enrollment.

**CHIN 311 ACCELERATED INTERMEDIATE CHINESE I (3)**

Emphasis on reading narrative texts, and understanding authentic oral texts. Writing assignments stress skills necessary for basic personal needs and tasks necessary for writing social correspondence. At the completion of 311, students will be able to write approximately 700 Chinese characters, and be able to perform communicative tasks appropriate to this range of characters. Pre-requisite(s): CHIN 212, or placement test or permission of instructor. Offered Fall.

**CHIN 312 ACCELERATED INTERMEDIATE CHINESE II (3)**

Continuation of CHIN 311. More emphasis on reading narratives, comprehending authentic oral texts, and speaking in more formal contexts. Writing assignments stress skills necessary for expressing arguments on socio-cultural topics. At the completion of CHIN 312, students will be able to write approximately 1000 Chinese characters. Pre-requisite(s): CHIN 302 and CHIN 311, or placement test or permission of instructor. Recommended prerequisite(s): Ability to write approximately 700 characters assumed. Repeatable for Credit. Limited enrollment.

**CHIN 313 MEDIA CHINESE (3)**

Advanced intermediate course, designed to familiarize students with the language of print and broadcast media with a focus on news media. Students will learn strategies and tactics applicable to newspaper reading and skills essential for understanding news broadcasting. Introduction to Classical Chinese discourse as related to modern Chinese media discourse also included. Pre-requisite(s): CHIN 302 or CHIN 312, or placement test or permission of instructor. Recommended prerequisite(s): Ability to write 800 characters assumed.

**CHIN 314 CONTEMPORARY CHINA: CULTURE AND SOCIETY SINCE 1978 (3)**

The objective of this course is two-fold. First, this writing/reading intensive course aims at advancing the students' overall language proficiency to Intermediate High. Second, this course is designed to enhance the students' understanding of the social and cultural transformation in contemporary China that resulted from the Economic Reform of 1978. Pre-requisite(s): CHIN 311 and CHIN 302, or placement test or permission of instructor. Limited enrollment. Offered Spring.

**CHIN 315 TAIWAN'S FILMS SINCE 1980 (3)**

This course discusses influential Taiwanese films since 1980 as pieces of artwork and as reflections of Taiwan's cultural, social, economic, and political changes in the past three decades. Language assignments are designed to help students develop proficiency in reading authentic materials, writing essays, and giving reports. Current collaborations among Taiwan, China, and Hong Kong in film productions also included. Pre-requisite(s): CHIN 302 and CHIN 312. Offered Fall.

**CHIN 316 TEXT FROM POPULAR CULTURE: ADVANCED AND INTERMEDIATE CHINESE (3)**

Presents Chinese through film, popular songs, short fiction, and Chinese cuisine. Reading material is generally from authentic texts. Students perform regular short writing assignments in an increasing formal style. Pre-requisite(s): CHIN 302 and CHIN 311, or placement test or permission of instructor. Recommended prerequisite(s): Ability to write approximately 700 characters assumed.

**CHIN 318 MEDICAL CHINESE (3)**

Emphasis on communication skills in situations related to health care in Chinese and American contexts. Basic traditional concept and theory (as in herbal medicine, acupuncture, and folk belief) in traditional Chinese medical practices will be explored. Pre-requisite(s): CHIN 301 or CHIN 311 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Chen.

**CHIN 321 STRUCTURE OF CHINESE: SYNTAX & SEMANTICS (3)**

Examination of syntactic and semantic features of Chinese with special attention to contrastive analysis of selected topics of Chinese and English, including expressions of tense and aspect, conditional and counterfactual, word formation (morphology), the notion of syntactic category, grammaticalization, Chinese writing system and sociolinguistics. Taught in English. Cross-listed with LING 321. Limited enrollment. Offered Fall.

**CHIN 322 TAIWANESE LANGUAGE AND LITERATURE (3)**

This course contains two parts running concurrently every week. Part one focuses on language acquisition. Online textbook is Taiwanese on Campus, by L. Chen. Emphasis is on daily, practical expressions. Part two is an examination of Taiwanese nativist literature with special attention to its language/cultural and political/historical background. Limited enrollment. Offered Spring.

**CHIN 330 INTRODUCTION TO TRADITIONAL CHINESE POETRY (3)**

This course seeks to decode enchanting features of traditional Chinese poetry through examining the transformation of poetic genres, the interaction between poetic creation and political, social, and cultural changes, and the close association of poetry with art. Thus, this course also serves to understand Chinese culture and history through poetic perspectives. All readings in English translation. No knowledge of Chinese language required. Cross-listed with ASIA 330, MDST 370.

**CHIN 332 CHINESE LITERATURE AND ITS MOVIE ADAPTATIONS (3)**

Exploration of modern Chinese literature through the visual imagery of Chinese films to show how and why different time periods and different media affect the theme of a story. One third covers movie adaptations of classical Chinese literature. Films subtitled in English, shown outside of class. All readings in English translation. Cross-listed with ASIA 332.

**CHIN 334 TRADITIONAL CHINESE TALES AND SHORT STORIES (3)**

Learning Chinese Literature and culture through reading vernacular stories, fantastic tales, biographies, and philosophical parables. Discussion topics: literature and Confucianism, Taoism, and Buddhism; literature and history; self and other; fantastic world and reality; women as domestic aliens and aliens portrayed as women; etc. Readings are in English translation. Cross-listed with ASIA 334.

**CHIN 335 INTRODUCTION TO CLASSICAL CHINESE LITERATURE (3)**

Examination of the basic characteristics of classical Chinese novels, primarily through six important works from the 16th to 18th centuries: Water Margin, Monkey, Golden Lotus, Scholars, Romance of the Three Kingdoms, and Dream of the Red Chamber. Cross-listed with ASIA 335, MDST 375.

**CHIN 399 CHINESE TEACHING PRACTICUM (2 TO 3)**

This course gives students with advanced proficiency in Chinese the opportunity to acquire teaching experience in tutorial format. For each credit hour registered, the student must tutor for two hours. Regular meetings with supervising faculty member. Must be familiar with the Pinyin system. Instructor permission required. Instructor permission required. Repeatable for Credit. Limited enrollment. Offered Fall & Spring.

**CHIN 411 ADVANCED CHINESE I (3)**

First advanced course, uses authentic materials (literary texts, films, Chinese media, and websites) to expose students to different discourse styles, help them cultivate sociocultural awareness and engage them in purposeful communicative tasks. Emphasis on essay writing, oral fluency (summarizing, comparing, narrating, describing...), and communicative competence. Classical Chinese is also introduced. Pre-requisite(s): CHIN 312 and CHIN 313 and CHIN 314 and CHIN 316 and CHIN 302, or placement test or permission of instructor. Recommended prerequisite(s): Ability to write 1000 characters.

**CHIN 412 ADVANCED CHINESE LANGUAGE AND CULTURE II (3)**

Continuation of CHIN 411, aims to help students further develop oral and writing skills to provide structured arguments for supporting opinions, to construct hypotheses, to discuss abstract topics, and to critique sociopolitical issues. Continued emphasis on developing communicative strategies, discourse styles, cultural literacy, and the ability to read Classical Chinese texts. Pre-requisite(s): CHIN 411, or placement test or permission of instructor. Recommended prerequisite(s): Ability to write 1200 characters.

**CHIN 422 THE ORIGINAL BEAUTY OF CHINESE LITERATURE (3)**

The course will expose students to the best literary works created in the Chinese tradition, both classical and modern, and give them a general introduction to different genres, including poetry, fiction, drama, and philosophical essays. It will improve their language proficiency through reading original texts of Chinese literature. Cross-listed with ASIA 422.

## CLAS (CLASSICAL STUDIES)

### School of Humanities/Classical Studies

#### **CLAS 101 FRESHMAN SEMINAR: SOCRATES: THE MAN AND HIS PHILOSOPHY (3)**

Socrates, the first moral philosopher, was convicted of impiety and executed by his fellow citizens. His influence on Western thought has been immense, though he left no writings. Readings from Plato's dialogues, with emphasis on the *Apology* and *Gorgias*. In addition to papers, each participant will make one presentation and lead one. Cross-listed with FSEM 101. Must be in one of the following Classification(s): Freshman, Sophomore. Limited enrollment. Not offered this academic year. Instructor(s): Yunis.

#### **CLAS 107 GREEK CIVILIZATION AND ITS LEGACY (3)**

An examination of the literary, artistic, and intellectual achievements of classical Greek civilization from Homer through the golden age of classical Athens to the spread of Greek culture in the Hellenistic world. The influence of ancient Greece on Western culture will be a focus. Case studies in the later reception of classical Greek literature (e.g., tragedy), philosophy (e.g., Socrates), history (e.g., democracy), and art (e.g., Parthenon) will be examined. Cross-listed with HUMA 109. Offered Fall. URL: [classicallegacy.rice.edu](http://classicallegacy.rice.edu). Instructor(s): Widzisz.

#### **CLAS 108 ROMAN CIVILIZATION AND ITS LEGACY (3)**

This course will investigate central aspects of Roman civilization: politics, religion, law, oratory, private life, public entertainment, literature, and visual art and architecture. Through case studies, we will also examine the place of ancient Rome in the western imagination, and the influence of ancient Rome on later politics, literature, and art. Cross-listed with HUMA 111. Offered Spring. URL: [classicallegacy.rice.edu/](http://classicallegacy.rice.edu/). Instructor(s): McGill.

#### **CLAS 131 NO HAPPY ENDINGS: TRAGEDY IN LITERATURE AND FILM (3)**

Tragedy stages the suffering and fall of a hero. It excites pity and fear. Why, then, do we take pleasure in tragedy? This course explores the importance of tragedy in Western culture through a reading of plays by Sophocles, Shakespeare, Racine, and Ibsen. Films include works by Robinson and Schlöndorff. Cross-listed with FREN 131, FSEM 131. Not offered this academic year. URL: [classicallegacy.rice.edu](http://classicallegacy.rice.edu). Instructor(s): Shea.

#### **CLAS 201 HISTORY OF PHILOSOPHY I (3)**

Survey of the major philosophers and philosophical systems of ancient Greece, from Parmenides to the Stoics. Cross-listed with MDST 201, PHIL 201. Offered Fall & Spring. Instructor(s): Morrison.

#### **CLAS 209 GREEK AND ROMAN DRAMA (3)**

Greek: A reading and dramatic analysis of Aeschylus's "Oresteia" (three plays), Sophocles's "Oedipus the King", "Oedipus at Colonus", "Electra and Antigone"; The "Medea" "Orestes", and "Electra" of Euripides. Latin: A reading and analysis of the "Menaechmi" and the "Miles Gloriosus" of Plautus, the "Phormio" of Terence and the "Medea" of Seneca. Cross-listed with ENGL 209. Not offered this academic year. Instructor(s): Mitchell.

#### **CLAS 210 HOMER AND VIRGIL AND THEIR RECEPTION (3)**

This course will read Homer's *Iliad* and *Odyssey* and Virgil's *Aeneid* in translation and will examine case studies in the reception of those works in post-classical western literature and criticism. Offered Fall & Spring. URL: [classicallegacy.rice.edu](http://classicallegacy.rice.edu). Instructor(s): McGill.

#### **CLAS 214 CASE STUDIES IN ROMAN ART (3)**

This course offers students with little or no background an introduction to Roman art through weekly case studies of some of the most important public and private works. Subjects to be addressed include patronage, visuality, narrative, and style within the changing contexts of republic and empire. Cross-listed with HART 210. Limited enrollment. Instructor(s): Quenemoen.

#### **CLAS 220 THE NOVEL IN CLASSICAL ANTIQUITY (3)**

Shipwrecks, romance, travel, warfare, debauchery, and a man metamorphosed into a donkey. All appear in ancient Greek and Roman prose fiction, examples of which we will read in translation. Topics will include the form's origins, whether the term "novel" adequately defines the texts, and the works' ancient readership. Not offered this academic year. Instructor(s): McGill.

#### **CLAS 225 WOMEN IN GREECE AND ROME (3)**

Survey of the depiction of women in Greek and Roman mythology, literature, and art. Includes a study of the lives of Greek and Roman women as evidenced by archaeological as well as literary materials. Cross-listed with SWGS 225. Not offered this academic year. URL: [classicallegacy.rice.edu/](http://classicallegacy.rice.edu/). Instructor(s): Widzisz.

**CLAS 230 GREEK AND ROMAN SOURCES IN THE HISTORY OF OPERA (3)**

The aim of this course is to develop critical skills and new ideas about classical antiquity and western music of the last four centuries, with special reference to musical drama. This course takes a literary-historical approach to what has come to be known as opera. Among the major themes we will discuss are the complex admixture of factors which produced the earliest operas, the persistent influence of Ovid, the appeal of mythic Crete, Greek and Roman history, the centrality of pastoral poetry in the history of the genre, and recurrent efforts through musical-literary history since 1600 to 'reform' and correct 'abuses' in compositional style in poetry and music. Cross-listed with MUSI 230. Offered Spring. Instructor(s): Anderson.

**CLAS 231 HISTORY OF ITALIAN RENAISSANCE LITERATURE AND CULTURE (3)**

Italian literature and culture from the early masters through the late Renaissance. Primary sources to be studied in historical context include Dante's *Commedia*, Petrarch's *Canzoniere*, and Boccaccio's *Decameron*, major writings by 15th-century humanists (Bruni, Bracciolini, Poliziano, Pico), and 16th-century works by Bembo, Ariosto, Michelangelo, Castiglione, and Tasso. Offered Spring. Instructor(s): Anderson.

**CLAS 235 CLASSICAL MYTHOLOGY: INTERPRETATION, ORIGINS, AND INFLUENCE (3)**

We will read and analyze some of the most influential Greek myths (including their parallels and permutations in other cultures). Employing insights from a variety of theoretical approaches to myth, we will identify typical story patterns, characters, and events, and the values, anxieties, and aspirations for which they stand. Offered Fall. URL: [classicallegacy.rice.edu](http://classicallegacy.rice.edu). Instructor(s): Mackie.

**CLAS 301 ANCIENT AND MEDIEVAL PHILOSOPHY (3)**

Topics in the history of philosophy from the 4th century B.C. through the 14th century. Cross-listed with MDST 301, PHIL 301. Not offered this academic year. Instructor(s): Morrison.

**CLAS 311 TEXT AS PROPERTY, PROPERTY AS TEXT: ACROSS THE AGES (3)**

Examines forms and norms of authorship and ownership from antiquity to the present. What is an author? Is a text public or private property? What are the licit/illicit forms of rewriting and appropriating a text, and how are those forms defined? This class investigates historically these and other issues. Cross-listed with ANTH 321. Not offered this academic year. Instructor(s): McGill.

**CLAS 312 GREEK ART AND ARCHITECTURE (3)**

Achronological survey of sculpture, painting, and architecture of Greece, and the Aegean Islands, and Western Asia Minor from the Bronze Age through the Hellenistic period (3300-31 BC). Analysis of style, content, and purpose within the cultural and historical contexts. Cross-listed with HART 312. Not offered this academic year. Instructor(s): Quenemoen.

**CLAS 315 ROMAN ART AND ARCHITECTURE (3)**

A chronological survey of Roman sculpture, painting, and architecture from its Etruscan beginnings to the late Empire. Art and architecture of Rome and the provinces considered within their larger social, political, and urban contexts. Particular attention given to patronage, the relation between Roman and Greek art, and Rome's position as an artistic center. Cross-listed with HART 315. Not offered this academic year. Instructor(s): Quenemoen.

**CLAS 316 DEMOCRACY AND POLITICAL THEORY IN ANCIENT GREECE (3)**

This course will consider how democracy arose and developed in classical Greece. The course will consider how Athenian direct democracy functioned and what are the differences between ancient and modern democracy. Not offered this academic year. Instructor(s): Yunis.

**CLAS 318 THE INVENTION OF PAGANISM IN THE ROMAN EMPIRE (3)**

This interdisciplinary course examines the development of the concept of "paganism" in the Roman empire during the first through seventh centuries AD. We will examine the mutually tolerant character of the many religions of the Roman world and see how the category of paganism was invented and applied by Christians to all the polytheists of the empire and beyond. Not offered this academic year. Instructor(s): McGill; Maas.

**CLAS 320 THE AGE OF AUGUSTUS (3)**

After defeating Antony and Cleopatra the emperor Augustus restored stability to Rome, oversaw the expansion of the empire, and made Rome a capital city. Study of art and literature of this 'Golden Age' will address Augustus' construction of identity, imperial and non-imperial patronage, and the formation of Augustan ideology in Rome and the provinces. Cross-listed with HART 320. Not offered this academic year. Instructor(s): McGill; Quenemoen.

**CLAS 321 SPECIAL TOPICS IN ANCIENT ART (3)**

Two-week course in Rome that introduces major monuments of the city. Focuses on both the history and function of these monuments in antiquity and explores how their meaning has evolved in the post-classical world. Cross-listed with HART 318. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): McGill & Quenemoen.

**CLAS 336 THE ORIGIN OF THE LANGUAGES OF EUROPE (3)**

Languages as superficially different as English, Greek, Latin, and Sanskrit in fact all developed from a single "proto-language". This course will explore the following questions: What was this proto-language like? How do we know what it was like? What can we learn about its speakers on the basis of the words that have survived in the various daughter languages? Not offered this academic year.

**CLAS 337 EPIC AND NOVEL (3)**

Why did novelists of the eighteenth, nineteenth, and twentieth centuries allude to classical epic, and how did they transform the genre? We will address these questions, reading the Homeric and other ancient epics alongside such novels as Fielding's *Tom Jones*, Eliot's *Middlemarch*, and Joyce's *Ulysses*. Cross-listed with ENGL 335. Not offered this academic year. Instructor(s): Mackie.

**CLAS 339 MYTHS OF OTHERWORLD JOURNEY (3)**

Analysis and comparison of myths of "otherworld journey" in ancient, medieval, and modern texts. Who are the typical tellers of and audiences for such tales, and how do they function both in their immediate and in their broader cultural contexts? All works read in English translation. Not offered this academic year. Instructor(s): Mackie.

**CLAS 416 THE QUEST FOR ORIGINALITY IN CLASSIC ART (3)**

Seminar examines how modern interests in originality and related desires for original artworks have shaped classical art history. Course considers differences between ancient and modern notions of originality; the degenerative view of Roman art based on the copying of Greek originals; how the modern quest to reconstruct lost originals has impacted the way we see antiquity today. Cross-listed with HART 416. Limited enrollment. Not offered this academic year. URL: [classicallegacy.rice.edu/](http://classicallegacy.rice.edu/). Instructor(s): Quenemoen.

**CLAS 491 SPECIAL TOPICS (3)**

Independent work. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Fall.

**CLAS 492 SPECIAL TOPICS (3)**

Independent work. Must be in one of the following Classification(s): Junior, Senior. Instructor permission required. Repeatable for Credit. Offered Spring.

**CLAS 493 SENIOR THESIS (3)**

Open to classics majors in the final semester of study. Thesis, to be written on a topic of the student's choice in consultation with a member of the faculty. Must be in one of the following Classification(s): Senior. Instructor permission required. Offered Spring.

**COMP (COMPUTER SCIENCE)****School of Engineering/Computer Science****COMP 100 INTRODUCTION TO COMPUTING AND INFORMATION SYSTEMS (3)**

Introduction to computer organization, operating systems, programming languages, artificial intelligence, and programming. Open to nonscience and nonengineering students. May not be taken for credit after any other programming course. Offered Fall & Spring. Instructor(s): Nguyen.

**COMP 101 FRESHMAN SEMINAR IN COMPUTER SCIENCE (1)**

This seminar presents an overview of Computer Science for students who have not chosen a major. Weekly lectures address different topics in Computer Science. No technical background is assumed. The goal is to help students understand the problems that Computer Scientists attack and the impact of those solutions on society. Offered Spring. Instructor(s): Cooper.

**COMP 110 COMPUTATION IN SCIENCE AND ENGINEERING (3)**

The course introduces basic techniques for problem solving and visualization using computational environments such as Mathematica and MATLAB. Class will consist of a mixture of traditional lectures held in classrooms and self-paced modules covering topics in science and engineering that will be completed in Symonds II. No previous experience is required or expected. Cross-listed with NSCI 230. Limited enrollment. URL: [www.owlnet.rice.edu/~comp110](http://www.owlnet.rice.edu/~comp110).

**COMP 200 ELEMENTS OF COMPUTER SCIENCE (3)**

Broad introduction to major topics in computer science. Includes algorithms, mathematical models of computation, machine organization and design, programming languages, communication, and artificial intelligence. This course is intended for majors outside of Science and Engineering. URL: [www.owlnet.rice.edu/~comp200](http://www.owlnet.rice.edu/~comp200).

**COMP 201 PRINCIPLES OF OBJECT-ORIENTED PROGRAMMING I (4)**

Introduction to computing focusing on the principles of object-oriented programming using design patterns coupled with progressively richer subsets of the Java programming language. Program design concepts such as structural and behavioral abstractions are emphasized in building contemporary dynamic software systems. Design Patterns are used as a vocabulary for codifying these abstractions and expressing fundamental computing principles. They are illustrated in the design and implementation of lists, trees and arrays and their associated algorithms that leverage both run-time and parametric polymorphism. The course utilizes UML diagrams for object modeling and unit testing as a part of an incremental, test-driven approach to writing programs. Recommended for Engineering and other non-Comp majors, plus students who have yet not committed to a COMP major. Offered Spring. URL: [www.owl.net.rice.edu/~comp201](http://www.owl.net.rice.edu/~comp201). Instructor(s): Wong; Nguyen.

**COMP 202 PRINCIPLES OF OBJECT-ORIENTED PROGRAMMING II (4)**

Continuation of COMP 201 covering advanced object-oriented data structures and their associated algorithms such as lazy evaluation, heaps, self-balancing trees, graphs, sorting, and generative recursion. Applications of Software Engineering principles such as abstract decomposition, decoupling, and command passing to large- and small-scale component-framework systems. Multi-threaded event-driven applications provide compelling illustrations for such principles. Recommended for Engineering majors, non-Engineering students, and potential Computer Science majors. Pre-requisite(s): COMP 201. Offered Fall. Instructor(s): Wong, Nguyen.

**COMP 210 AP PRINCIPLES OF COMPUTING AND PROGRAMMING (4)**

Introduction to the principles of computer programming. Includes functional programming, data abstraction, procedural abstraction, reduction rules, use of control and state, object-oriented programming, program optimization, algorithm efficiency. Students will learn the practical skills required to write and modify programs. Laboratory assignments use Scheme. May not receive credit for COMP 211 after taking COMP 210. Required for computer science majors. Offered Fall.

**COMP 211 AP CREDIT IN COMPUTER SCIENCE (3)**

This course is used only to provide credit for students who have received a 4 or 5 on the Computer Advanced Placement Examination. This credit does not count toward satisfying any course requirements for the Computer Science major, but does count toward the total credit hours required for graduation.

**COMP 212 INTRODUCTION TO THE PRINCIPLES OF OBJECT-ORIENTED PROGRAMMING (4)**

This course focuses on teaching students how to apply the principles of program design taught in COMP 210 to the context of object-oriented programming using JAVA. Many of these principles are codified in an object-oriented context as object-oriented design patterns. The course also covers basic algorithms and data structures from an object-oriented perspective. Pre-requisite(s): COMP 210. Offered Spring.

**COMP 280 MATHEMATICS OF COMPUTATION (3)**

This course provides an introduction to the use of mathematics in modeling and reasoning about problems in computer science. Topics include logic, proof methods (including mathematical and structural induction), reasoning about recursive and iterative programs, sets, functions and their asymptotic growth, counting, and modular arithmetic. Pre-requisite(s): COMP 210. Offered Spring.

**COMP 290 COMPUTER SCIENCE PROJECTS (1 TO 3)**

Theoretical and experimental investigations under staff direction. Course equivalency: COMP 390. Instructor permission required. Repeatable for Credit.

**COMP 300 SOCIETY IN THE INFORMATION AGE (3)**

We will review the remarkable technology of the Information Age and examine its effects on the ways in which we live, work and think about the world around us. We will consider, for example, how the pervasive use of computers and networks is changing our ideas about property, privacy, authority, social relations, knowledge and identity. As we will discuss what further changes we might see as technology continues to advance. Offered Spring. Instructor(s): Gorry.

**COMP 301 IDENTITY THEFT TO THE IPOD: TECHNOLOGY AND POLITICS IN THE INFORMATION AGE (3)**

Information and computing technologies (ICT) have produced sweeping changes in societal, economic and political domains. Examining the relationship between ICT and public policy, this course will cover current issues including computer crime, immigration, intellectual property and online commerce to better understand the intersection of the microchip and democratic society. Repeatable for Credit. Instructor(s): Vardi.

**COMP 311 PROGRAMMING LANGUAGES (4)**

The design, definition and abstract implementation of programming languages including methods for precisely specifying syntax and semantics. Pre-requisite(s): COMP 212 or COMP 202. Offered Spring.

**COMP 312 PRODUCTION PROGRAMMING (4)**

This course focuses on the principles and practices of test-driven software development, which have been popularized under the banner of "Extreme Programming". To provide students with practical experience, the course engages students in the development of open source production programs written in JAVA or C#. The DRJAVA programming environment used in our core programming courses was developed by students in this course. Some of the major topics covered in course lectures include design patterns for controlling concurrency and refactoring transformations to improve legacy code. Prerequisite(s): COMP 202 or COMP 212. Offered Spring.

**COMP 314 APPLIED ALGORITHMS AND DATA STRUCTURES (4)**

Design analysis of computer algorithms and data structures useful for applied problems. Laboratory assignments will use these techniques in conjunction with advanced programming methods. Cross-listed with ELEC 322. Pre-requisite(s): COMP 212 and COMP 280. URL: [www.owl.net.rice.edu/~comp314](http://www.owl.net.rice.edu/~comp314). Instructor(s): Wallach.

**COMP 320 INTRODUCTION TO COMPUTER SYSTEMS (4)**

This course introduces computer systems from the programmer's perspective. Topics include data representation, the compilation process, and system-level programming concepts such as interrupts and concurrency. Pre-requisite(s): COMP 212 and ELEC 220. Pre-requisite: ELEC 220 and either COMP 212, 202 or Advanced Placement Computer Science. Offered Fall. URL: [www.owl.net.rice.edu/~comp320](http://www.owl.net.rice.edu/~comp320). Instructor(s): Rixner.

**COMP 326 DIGITAL LOGIC DESIGN (3)**

Gates, flip-flops, combinational and sequential switching circuits, registers logical and arithmetic operations. Cross-listed with ELEC 326. Pre-requisite(s): ELEC 220.

**COMP 360 COMPUTER GRAPHICS (4)**

2D graphic techniques including fast line and curve drawing and polygon filling, 3D graphics problems including representation of solids, shading, and hidden surface elimination. Fractals, graphics standards. Pre-requisite(s): COMP 212.

**COMP 390 COMPUTER SCIENCE PROJECTS (1 TO 3)**

See COMP 290. Course equivalency: COMP 290. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 409 LOGIC IN COMPUTER SCIENCE (3)**

Set theoretical concepts. Propositional and first-order logic. Soundness and completeness, incompleteness, undecidability. Logical issues in computer science. Pre-requisite(s): COMP 201 or COMP 210 and COMP 280. Offered Fall.

**COMP 410 SOFTWARE ENGINEERING METHODOLOGY (4)**

COMP 410 is a pure discovery-based learning course designed to give students real-life, hands-on training in a wide variety of software engineering issues that arise in creating large-scale, state-of-the-art software systems. The class forms a small software development "company" that works to deliver a product to a customer. The topics encountered include and are not limited to, dealing with new technologies (e.g. C#, .NET, distributed computing), advanced object-oriented programming and design, interacting with customers, problem specification and tasking, individual and group communications, human resource management, group leadership, testing, integration and documentation. Traditional development cycle methodologies will be compared to recent, "agile" techniques. Pre-requisite(s): COMP 202 or COMP 212. Recommended prerequisite(s): COMP 312 or COMP 314. Offered Fall. URL: [www.owl.net.rice.edu/~comp410](http://www.owl.net.rice.edu/~comp410). Instructor(s): Wong.

**COMP 411 ADVANCED PROGRAMMING LANGUAGES (4)**

The design, definition and abstract implementation of programming languages including methods for precisely specifying syntax and semantics. Pre-requisite(s): (COMP 212 or COMP 202) and COMP 280 and COMP 311. Offered Spring.

**COMP 412 COMPILER CONSTRUCTION (4)**

Topics in the design of programming language translators, including parsing, run-time storage management, error recovery, code generation and optimization. Pre-requisite(s): COMP 314 and COMP 320. Offered Fall.

**COMP 413 DISTRIBUTED PROGRAM CONSTRUCTION (4)**

This course focuses on modern principles for the construction of distributed programs, with an emphasis on design patterns, modern programming tools, and distributed object systems. The material will be applied in a substantial software design/construction project. Pre-requisite(s): COMP 312 and COMP 421 or permission of instructor. Not offered this academic year.

**COMP 415 REAL-WORLD SOFTWARE DEVELOPMENT (4)**

Experience real customers, software, and situations. The class will be contracted by an industrial customer to design build, and deliver a product. Negotiate to finalize specifications, updates, and delivery schedules. Encounter real-life issues such as team management, intellectual property, and vagueness and specification changes while developing a state-of-the-art software application. Pre-requisite(s): COMP 410. Offered Spring. Instructor(s): Wong.

**COMP 420 INTRODUCTION TO DISTRIBUTED COMPUTER SYSTEMS (4)**

Introduction to advanced operating systems and distributed systems. The course covers concepts, architecture, algorithms, protocols and implementation focusing on distribution, scale, robustness in the face of failure, and security. Pre-requisite(s): COMP 421. Not offered this academic year.

**COMP 421 OPERATING SYSTEMS AND CONCURRENT PROGRAMMING (4)**

Introduction to the design, construction, and analysis of concurrent programs with an emphasis on operating systems, including filing systems, schedulers, and memory allocators. Specific attention is devoted to process synchronization and communication within concurrent programs. Cross-listed with ELEC 421. Pre-requisite(s): (COMP 212 or COMP 202) and COMP 320. Offered Spring.

**COMP 422 PARALLEL COMPUTING (4)**

Fundamentals of parallel computing including abstract models for parallel computation, parallel computer architectures, parallel algorithms, and data structures, programming models and methods, mapping and scheduling computation, analyzing computations for correctness and efficiency, and applications to science and engineering. Includes an extensive programming component. Pre-requisite(s): COMP 212 and COMP 320. URL: [www.owl.net.rice.edu/~comp422/](http://www.owl.net.rice.edu/~comp422/). Instructor(s): Mellor-Crummey.

**COMP 425 COMPUTER SYSTEMS ARCHITECTURE (4)**

Design of advanced uniprocessor system architecture and basics of parallel architectures. Advanced pipelining, including dynamic scheduling and precise interrupt handling. Advanced techniques for exploiting instruction level parallelism, including superscalar and VLIW architectures. Case studies of several recent high-performance microprocessors. Vector processors. Memory system design-techniques to improve cache performance, virtual memory systems, main memory enhancements. I/O systems--disk arrays and graphical interfaces. An overview of parallel computers. Cross-listed with ELEC 425. Pre-requisite(s): (COMP 320 or ELEC 320) and ELEC 326. Offered Fall. URL: [www.owl.net.rice.edu/~comp425/](http://www.owl.net.rice.edu/~comp425/).

**COMP 429 INTRODUCTION TO COMPUTER NETWORKS (4)**

Network architectures, algorithms and protocols. Local- and wide-area networking. Intra- and inter-domain routing. Transmission reliability. Flow and congestion control. TCP/IP. Multicast. Quality of service. Network security. Networked applications. Cross-listed with ELEC 429. Pre-requisite(s): (STAT 310 or ELEC 331) and (COMP 202 or COMP 212). Offered Spring.

**COMP 430 INTRODUCTION TO DATABASE SYSTEMS (3 TO 4)**

Query Introduction to relational database systems, SQL programming, Database application programming, and Database design. Pre-requisite(s): (COMP 202 or COMP 212) and COMP 280.

**COMP 435 ELECTION SYSTEMS, TECHNOLOGIES, AND ADMINISTRATION (3)**

This multidisciplinary course will consider how elections are conducted to enhance participation, to accurately measure the will of the electorate, and to be sufficiently rigorous to convince all parties that the results are legitimate. This course will consider the design and evaluation of election technologies, ranging from voter registration through the polling booth and vote tabulation. This course will consider three questions: how do individual voters interact with the voting technology; how are voting technologies engineered to be accurate and secure, and how do the societal aspects of voting fulfill democratic goals for elections? A central requirement for this course will be group research projects, many operating in our community, built around the November 2006 election. Offered Fall. Instructor(s): Wallach; Stein; Byrne.

**COMP 440 ARTIFICIAL INTELLIGENCE (4)**

Techniques for simulating intelligent behavior by machine, problem solving, game playing, pattern perceiving, theorem proving, semantic information processing, and automatic programming. Cross-listed with ELEC 440. Pre-requisite(s): (COMP 212 or COMP 202) and COMP 280. Offered Fall.

**COMP 446 MOBILE WIRELESS SERVICES PROJECT (3)**

Design and implement a wireless mobile information system utilizing Windows Mobile hardware (SmartPhone and PDA), Visual Studio .NET and .NET services to run over cellular data networks (Ev-Do, Edge) and the Rice 802.11b wireless infrastructure. Students will be provided with hardware, required software and access to a .NET server. Preference given to students who have experience with Visual Studio or have taken COMP 410, COMP 415 or ELEC 694. Cross-listed with ELEC 446. Prerequisite(s): COMP 410 or COMP 415 or COMP 314. Repeatable for Credit. Limited enrollment. Instructor(s): Cutler.

**COMP 450 ALGORITHMIC ROBOTICS (4)**

An introduction to computing object motion in application domains such as robotics, manufacturing, animation, and pharmaceutical drug design. Topics covered include motion planning in known and partially known environments, uncertainty, manipulation, and assembly planning. Pre-requisite(s): (COMP 202 or COMP 212) and COMP 314. Offered Fall.

**COMP 460 ADVANCED COMPUTER GRAPHICS (4)**

Advanced topics in computer graphics and geometric modeling, including B-spline curves and surfaces, solid modeling, radiosity, morphing, animation, simulation. Subdivision, fractals, wavelets, and other selected topics as time permits. Not offered every year. Pre-requisite(s): COMP 360. Offered Spring.

**COMP 470 FROM SEQUENCE TO STRUCTURE: AN INTRODUCTION TO COMPUTATIONAL BIOLOGY (4)**

This course is a modern introduction to problems in computational biology spanning sequence to structure. The course has three modules: the first introduces statistical techniques in sequence analysis; the second covers statistical machine learning techniques for understanding experimental data generated in computational biology; and the third introduces problems in the structure of complex biomolecules. Cross-listed with BIOE 470, STAT 470. Pre-requisite(s): COMP 280 and COMP 210 and STAT 310. Offered Spring. Instructor(s): Kavraki; Subramanian; Guerra; Kimmel.

**COMP 481 AUTOMATA, FORMAL LANGUAGES, AND COMPUTABILITY (3)**

Finite automata, regular expressions, regular languages, pushdown automata, context-free languages, Turing machines, recursive languages, computability, and solvability. Pre-requisite(s): COMP 314 and COMP 280. Offered Spring.



**COMP 482 DESIGN AND ANALYSIS OF ALGORITHMS (3)**

Methods for designing and analyzing computer algorithms and data structures. The focus of this course will be on the theoretical and mathematical aspects of algorithms and data structures. Cross-listed with ELEC 420. Pre-requisite(s): COMP 314 or permission of instructor. Offered Fall.

**COMP 485 FUNDAMENTALS OF MEDICAL IMAGING I (3)**

Fundamentals of various medical imaging modalities (e.g., x-ray, CT, and MRI) used to identify the anatomy of human organs, as well as other modalities (e.g. PET, SPECT, fMRI, and MEG) specifically developed to identify the function of the brain. Cross-listed with BIOE 485, ELEC 485. Pre-requisite(s): MATH 211 and MATH 212.

**COMP 486 FUNDAMENTALS OF MEDICAL IMAGING II (3)**

This course is directed towards graduate and senior undergraduate students interested in acquiring an in depth knowledge of Positron Emission Tomography (PET). The course will focus on PET physical principles, image formation, and processing. The course will also cover the various correction techniques used to quantify PET images as well as lay the foundations for understanding tracer kinetic modeling. A field trip to MD Anderson's PET facility will be organized to provide the students with hands on experience of PET imaging and data analysis. The use of PET imaging in various medical applications will also be covered. Cross-listed with BIOE 486, ELEC 486. Pre-requisite(s): ELEC 485 or BIOE 485 or COMP 485.

**COMP 490 COMPUTER SCIENCE PROJECTS (1 TO 4)**

Theoretical and experimental investigations under staff direction. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 491 COMPUTER SCIENCE TEACHING (3)**

A combination of in-service teaching and a seminar. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 492 COMPUTER SCIENCE HONORS PROJECT (1 TO 6)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 498 INTRODUCTION TO ROBOTICS (3)**

Introduction to the kinematics, dynamics, and control of robot manipulators and to applications of artificial intelligence and computer vision in robotics. Cross-listed with ELEC 498, MECH 498. Limited enrollment. Offered Spring. Instructor(s): O'Malley.

**COMP 502 NEURAL NETWORKS AND INFORMATION THEORY I (3)**

Review of major Artificial Neural Network paradigms. Analytical discussion of supervised and unsupervised learning. Emphasis on state-of-the-art Hebbian (biologically most plausible) learning paradigms and their relation to information theoretical methods. Applications to data analysis such as pattern recognition, clustering, classification, blind source separation, non-linear PCA. Cross-listed with ELEC 502. Pre-requisite(s): ELEC 430 and ELEC 431 or permission of instructor. URL: [www.ece.rice.edu/~erzsebet/ANNcourse.html](http://www.ece.rice.edu/~erzsebet/ANNcourse.html).

**COMP 511 MULTI-STAGE PROGRAMMING (4)**

Multi-stage programs can generate other programs at runtime, compile them, and execute them. Such programs can be significantly faster than single-stage ones. This course introduces multi-stage languages, their applications, theory, and implementation techniques. Coursework includes reading assignments, discussions, and various kinds of programming exercises using one such language (MetaOCaml). Pre-requisite(s): COMP 311 and COMP 411. Not offered this academic year. URL: [www.owl.net.rice.edu/~comp511](http://www.owl.net.rice.edu/~comp511).

**COMP 512 ADVANCED COMPILER CONSTRUCTION (4)**

Advanced topics in the design of an optimizing compiler. This course will focus on analysis and optimization of programs for uniprocessor machines, including program analysis (data-flow analysis, construction of static single-assignment form) and program transformation (redundance, constant values, strength reduction, etc.). The course uses a variety of readings from the literature and includes an implementation project. Pre-requisite(s): COMP 412. URL: [www.owl.net.rice.edu/~comp512](http://www.owl.net.rice.edu/~comp512).

**COMP 515 ADVANCED COMPILATION FOR VECTOR PARALLEL PROCESSORS (3)**

Advanced compilation techniques for vector and parallel computer systems, including the analysis of program dependence, program transformations to enhance parallelism, compiler management of the memory hierarchy, interprocedural data flow analysis, and parallel debugging. Pre-requisite(s): COMP 412. Offered Spring.

**COMP 517 RESOURCE AWARE PROGRAMMING (3)**

This course explores the design space for high-level languages that can support the more specialized task of resource-aware programming (RAP). Three research papers are covered each week with emphasis placed on developing the skills needed to read, understand, and present current research papers. In addition, the course includes an interactive reading group component. Instructor permission required.

**COMP 520 DISTRIBUTED SYSTEMS (4)**

Distributed systems: workstations, local area networks, server machines. Multiprocess structuring and interprocess communication. File access and memory management. User interfaces: window systems and command interpreters. Case studies of selected distributed systems. Emphasis on performance aspects of system software design. Cross-listed with ELEC 520. Pre-requisite(s): COMP 421 and COMP 425. Offered Fall.

**COMP 521 ADVANCED OPERATING SYSTEMS (4)**

Advanced topics in the design and implementation of state-of-the-art operating systems for general-purpose computation, emphasizing solutions to performance and scalability bottlenecks that are common with today's commercial and scientific workloads: process and thread management; NUMA memory management, super page support; SMP memory and address translation coherence; low-overhead, high-throughput I/O systems; robustness versus performance in file systems. Pre-requisite(s): COMP 421. Offered Fall. Instructor(s): Cox.

**COMP 522 MULTI-CORE COMPUTING (3)**

Multi-core microprocessors are becoming the norm. The course will focus on emerging multi-core processor architectures and challenges to using them effectively. Topics include multi-core microprocessors, memory hierarchy, synchronization, programming systems, scheduling, and transactional memory. Recommended Prerequisite(s): COMP 320, COMP 425, or instructor permission. Offered Fall. Instructor(s): Crumney.

**COMP 523 COMPUTER-AIDED DESIGN FOR VLSI (3)**

Fundamental topics in computer-aided design for VLSI: logic synthesis and formal verification, timing analysis and optimization, technology mapping, logic and fault simulation, testing, and physical design will be covered. Relevant topics in algorithms and data structures, generic programming, and the C++ standard template library will also be covered. Cross-listed with ELEC 523.

**COMP 524 MOBILE AND WIRELESS NETWORKING (3)**

Study of network protocols for mobile and wireless networking, particularly at the media access control, network, and transport protocol layers. Focus is on the unique problems and challenges presented by the properties of wireless transmission and host or router mobility. Cross-listed with ELEC 524. Prerequisite(s): COMP 429 or ELEC 429. Offered Fall.

**COMP 525 ADVANCED MICROPROCESSOR ARCHITECTURE (4)**

Exploration of the current trends and future directions of microprocessor architecture. Includes topics such as technology trends that affect microprocessor architecture, modern microprocessor design, techniques for statically and dynamically maximizing parallelism, memory system issues, and proposed future microprocessor architectures. Cross-listed with ELEC 525. Pre-requisite(s): ELEC 425 or COMP 425. Offered Spring. URL: [www.ownet.rice.edu/~elec525/](http://www.ownet.rice.edu/~elec525/).

**COMP 526 HIGH PERFORMANCE COMPUTER ARCHITECTURE (4)**

Design of high performance computer systems, including shared-memory and message-passing multiprocessors and vector systems. Hardware and software techniques to tolerate and reduce memory and communication latency. Case studies and performance simulation of high-performance systems. Cross-listed with ELEC 526.

**COMP 527 COMPUTER SYSTEMS SECURITY (4)**

This class will focus on computer security in real systems. We will cover theory and practice for the design of secure systems (formal modeling, hardware and compiler-enforced safety, software engineering processes, tamper-resistant and tamper-reactive hardware, firewalls, cryptography, and more). Pre-requisite(s): (COMP 311 or COMP 412) and (COMP 421 or COMP 429). Offered Fall.

**COMP 528 COMPUTER SYSTEMS PERFORMANCE ANALYSIS (4)**

Fundamental topics in performance analysis of computer systems: workload, characterization, measurement techniques, probability and statistics, experimental design, simulation, and analytical modeling. These techniques will be used to understand the performance of computer systems, serial and parallel programs, networks and client-server computing. Assignments will focus on applying these techniques in practice. Offered Spring.

**COMP 529 COMPUTER NETWORK PROTOCOLS AND SYSTEMS (4)**

Graduate level course on the study of protocols and systems for wide-area inter-networks with an emphasis on the challenges presented by the scale and complexity of the Internet. Topics include network architecture, router design, intra- and inter-domain routing, multicast services, congestion control, quality of service, network security, active and overlay network, network management. Cross-listed with ELEC 529. Pre-requisite(s): COMP 429 or ELEC 429. Offered Fall.

**COMP 537 COMPUTING DESIGN WITH NANOTECHNOLOGIES (3)**

CMOS transistors, building elements of modern computing are entering the nanometer era. This course aims at providing basic knowledge of nanotechnologies-based computing. It starts with addressing immediate challenges facing CMOS-based computing. It then covers emerging non-standard CMOS and non CMOS devices, their physical properties, fabrications, circuit design, and impacts on the existing design flow and computing paradigms. Offered Spring. Instructor(s): Zhong; Tour.

**COMP 540 ADAPTIVE SYSTEMS (4)**

Multi-disciplinary methods of designing and analyzing adaptive systems. Discussion of recent research in the areas of planning, scheduling and control as well as machine learning. Pre-requisite(s): COMP 440 or permission of instructor. Offered Spring.

**COMP 550 TOPICS IN PHYSICAL COMPUTING (4)**

Advanced topics in the design and application of algorithms for solving problems in the physical world. Offered Spring.

**COMP 559 MIGRATION AND DISPLACEMENT (4)****COMP 561 GEOMETRIC MODELING (4)**

Exploration of curves and surfaces (e.g. parametric form, implicit form, and conversion between forms), the representation of solids (e.g., wireframes, octrees, boundary representations, and constructive solid geometry), and applications (e.g., graphics, motion planning, simulation, and finite element mesh generation. Pre-requisite(s): COMP 360. Repeatable for Credit. Offered Spring.

**COMP 571 BIOINFORMATICS: SEQUENCE ANALYSIS (3)**

Pairwise and multiple sequence alignment, Markov chains and HMMs, Phylogenetic reconstruction, Haplotype inference, Computational models of RNA structure, Gene finding, Genome rearrangements, and comparative genomics. Offered Fall. Instructor(s): Nakhleh.

**COMP 583 PARALLEL ALGORITHMS AND ARCHITECTURE (3)**

Parallel architectures; shared memory, VLSI, message-passing. Structure and relation between architectures. Parallel time, work, and efficiency. Parallel algorithms for fundamental computational problems and applications. Network routing. Cross-listed with ELEC 519.

**COMP 584 SYMBOLIC COMPUTATION (3)**

Fundamental and advanced topics in symbolic computational symbolic-numerical arithmetic in basic domains, computing by homomorphic images, indefinite summation, computer analysis and the method of Groebner bases. The course also includes applications of symbolic computation to geometric modeling and theorem proving. Not offered this academic year.

**COMP 590 COMPUTER SCIENCE PROJECTS (1 TO 4)**

Advanced theoretical and experimental investigations under staff direction. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 600 GRADUATE SEMINAR IN COMPUTER SCIENCE (1)**

This seminar course meets weekly to discuss current research results by graduate students in the Computer Science Department. Senior students are expected to present their results. Must be enrolled in one of the following Major(s): Computer Science. Instructor permission required. Offered Fall & Spring. Instructor(s): Greiner.

**COMP 602 NEURAL NETWORKS AND INFORMATION THEORY II (3)**

Advanced topics in ANN theories, with a focus on Self-Organizing Maps and unsupervised learning. The course will be a mix of lectures and seminar discussions with active student participation, based on most recent research publications. Students will have access to professional software environment to implement theories. Cross-listed with ELEC 602. Pre-requisite(s): COMP 502 or ELEC 502. Repeatable for Credit. Limited enrollment.

**COMP 607 AUTOMATED PROGRAM VERIFICATION (1)**

Methods, tools and theories for the computer-aided verification of concurrent systems. Pre-requisite(s): COMP 409. Instructor permission required. Repeatable for Credit.

**COMP 610 GRADUATE SEMINAR IN PROGRAMMING LANGUAGES (1)**

A discussion of programming language semantics in computer science. Repeatable for Credit.

**COMP 612 GRADUATE SEMINAR IN COMPILER CONSTRUCTION (2)**

Topics in construction of programming language translators. Repeatable for Credit.

**COMP 613 GRADUATE SEMINAR IN ADVANCED LANGUAGE IMPLEMENTATION (3)**

Topics in advanced language implementation. Repeatable for Credit.

**COMP 615 PARALLEL PROGRAMMING SYSTEMS (2)**

This course will explore topics in parallel programming environments and compilers for parallel computers. Repeatable for Credit.

**COMP 617 GRADUATE SEMINAR IN RESOURCE AWARE PROGRAMMING (3 OR 4)**

While high-level programming languages can be very helpful for general-purpose programming, they can be unsuitable for programming systems that interact directly with the physical world. Such systems include real-time and embedded systems. This seminar explores the design space for high-level languages that can support the more specialized task of resource-aware programming (RAP). Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**COMP 620 GRADUATE SEMINAR IN DISTRIBUTED COMPUTING (1)**

Content varies at discretion of instructor. Instructor permission required. Repeatable for Credit.

**COMP 625 GRADUATE SEMINAR ON COMPUTER ARCHITECTURE (3)**

Subjects covering virtual memory and security structures, pipelines and vector processing, instruction set definitions, multi-threading, will be discussed. Both contemporary and "ancient systems" will be analyzed. Repeatable for Credit.

**COMP 629 GRADUATE SEMINAR IN COMPUTER NETWORKING (1)**  
This course will explore research topics in computer networking with an emphasis on the Internet. Topics include network algorithms and protocols, quality of service, network measurement, network management, network security, overlay networking. Repeatable for Credit.

**COMP 630 MULTI-TIER WIRELESS NETWORKS (3)**  
Topics in multi-tier wireless networks Instructor permission required. Repeatable for Credit.

**COMP 640 GRADUATE SEMINAR IN MACHINE LEARNING (3)**  
A reading course covering the latest developments in statistical machine learning and pattern recognition. Prerequisite(s): COMP 440. Instructor permission required. Repeatable for Credit.

**COMP 650 GRADUATE SEMINAR ON PHYSICAL COMPUTING (1)**  
Algorithmic issues related to physical problems of all scales, from the molecular to the astrophysical. Instructor permission required. Repeatable for Credit.

**COMP 661 GRADUATE SEMINAR: GEOMETRIC COMPUTATION (3)**  
Instructor permission required. Repeatable for Credit.

**COMP 685 FUNDAMENTALS OF MEDICAL IMAGING (3)**  
The course will introduce basic medical imaging modalities, such as x-ray, CT, and MRI, used to identify the anatomy of human organs, as well as other modalities, such as PET, SPECT, fMRI, and MEG, specifically developed to localize brain function. The course includes visits to clinical sites. Cross-listed with ELEC 685. Repeatable for Credit.

**COMP 690 RESEARCH AND THESIS (1 TO 12)**  
Repeatable for Credit.

**COMP 694 FUTURE PERSONAL COMPUTING TECHNOLOGIES (3)**  
Survey of the component and standards trends that are the basis of personal computers and digital appliances with the aim of predicting technologies, solutions, and new products five years into the future. Examples of these technologies are dual Core processors, iPods and their evolution, mobile wireless data devices, and even Google vs. Microsoft. Students will each pick a topic important to the digital lifestyle and through a series of one-on-one sessions develop a depth of understanding that is presented to the class. Cross-listed with ELEC 694. Offered Spring. Instructor(s): Cutler.

**COMP 800 GRADUATE RESEARCH (1 TO 15)**  
Repeatable for Credit. Offered Fall & Spring.

## CSCI (COGNITIVE SCIENCES)

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### School of Humanities/Cognitive Sciences

**CSCI 390 SUPERVISED RESEARCH IN COGNITIVE SCIENCES (3)**  
Supervised research on topics relevant to the cognitive sciences. Limited to majors in Cognitive Sciences. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**CSCI 481 HONORS PROJECT (3)**  
Independent directed research toward preparation of an undergraduate honors project or thesis. Instructor permission required. Offered Fall.

**CSCI 482 HONORS PROJECT (3)**  
Independent directed research toward preparation of an undergraduate honors project or thesis. Instructor permission required. Offered Spring.

## CSCS (CTR FOR THE STUDY OF CULTURES)

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### School of Humanities/Humanities Division

**CSCS 301 HRC UNDERGRADUATE FELLOWSHIP (1)**  
The HRC Undergraduate Fellowship requires that students attend a series of eight evening lectures by Rice alumni and faculty concerning the value and purpose of a degree in the humanities. Fellows will also be assigned to an HRC faculty fellow and participate in the HRCs programs throughout the academic year. Department permission required. Limited enrollment.

**CSCS 501 CSC MELLON RESEARCH SEMINAR (1 TO 6)**  
Faculty and doctoral student collaboration seminars. Topics vary from year to year. Offered by the School of Humanities through the Humanities Research Center. Repeatable for Credit.

**CSCS 502 CSC MELLON RESEARCH SEMINAR (1 TO 6)**  
Faculty and doctoral student collaboration seminars. Topics vary from year to year. Offered by the School of Humanities through the Humanities Research Center. Instructor permission required. Repeatable for Credit.

**CSCS 503 CSC MELLON RESEARCH SEMINAR (1 TO 6)**

Faculty and doctoral student collaboration seminars. Topics vary from year to year. Offered by the School of Humanities through the Humanities Research Center. Instructor permission required. Repeatable for Credit.

**CSCS 504 CSC MELLON RESEARCH SEMINAR (1 TO 6)**

Faculty and doctoral student collaboration seminars. Topics vary from year to year. Offered by the School of Humanities through the Humanities Research Center. Instructor permission required. Repeatable for Credit.

**CSCS 505 CSC MELLON RESEARCH SEMINAR (1 TO 6)**

Faculty and doctoral student collaboration seminars. Topics vary from year to year. Offered by the School of Humanities through the Humanities Research Center. Instructor permission required. Repeatable for Credit.

## ECON (ECONOMICS)

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### School of Social Sciences/Economics

**ECON 111 AP CREDIT IN MICROECONOMICS (1 TO 6)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ECON 112 AP CREDIT IN MACROECONOMICS (1 TO 6)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ECON 120 AN INTRODUCTION TO POLITICAL ECONOMY (3)**

This course will first cover the ideas of Smith, Malthus, Ricardo, Jevon, Keynes and issues associated with externalities and common property resources. Possible readings are: "Adam's Fallacy," "The Tragedy of the Commons," Coase, "The Problem of Social Cost," "Property Rules," "Liability Rules and Inalienability," "One View of the Cathedral." Limited enrollment. Offered Spring. Instructor(s): Britu.

**ECON 211 PRINCIPLES OF ECONOMICS I (3)**

Introduction to the nature of economics. Includes price systems, household decisions, cost and supply, marginal productivity and capital theory, industrial organization and control, economic efficiency, externalities, and public goods. Required for economics and mathematical economic analysis majors. Students (both majors and non-majors) enrolled at Rice who wish to transfer this course from another institution must pass a departmental qualifying examination. Limited enrollment. Offered Fall & Spring. Instructor(s): Soligo.

**ECON 250 FOUNDATIONS OF PUBLIC SECTOR ECONOMICS (3)**

The prime focus of the course is upon the government budget including taxes, expenditures, debt finance as well as government-owned enterprises. Effects of the budget on income distribution, efficiency and economic growth are also considered. Pre-requisite(s): ECON 211. Offered Spring. Instructor(s): Gillis.

**ECON 340 INTRODUCTION TO GAME THEORY (3)**

Game theory is a way of thinking about strategic situations. Ideas such as dominance, Nash equilibrium, evolutionary stability, backward induction, commitment, credibility, asymmetric information, adverse selection, and signaling are discussed and applied to games played in class and to examples drawn from economics, politics, the movies, and elsewhere. Some familiarity with the principles of microeconomics (e.g. ECON 211) is desirable, but not essential. No prior knowledge of game theory is assumed. Offered Fall. Instructor(s): Grant.

**ECON 348 ORGANIZATIONAL DESIGN (3)**

An introduction to the analysis, design, and management of organizations with an emphasis on incentives and information. Principles from economics, political science, and game theory will be applied to problems in project and team management, in organizational computing, and in allocating and pricing shared facilities. Cross-listed with POLI 348. Pre-requisite(s): ECON 211. Limited enrollment. Offered Spring. Instructor(s): Boylan.

**ECON 355 FINANCIAL MARKETS (3)**

Study the principles of U.S. and international equity and debt markets, and the interactions between such markets and various countries' monetary and exchange rate policies. The role of financial markets and institutions in the allocation and transfer of credit and risk is highlighted, and various existing and suggested regulatory frameworks are discussed. Pre-requisite(s): ECON 211. Limited enrollment. Offered Spring. Instructor(s): Bryant.

**ECON 370 MICROECONOMIC THEORY (3)**

Intermediate level analysis of markets, firms, households, income distribution, and general equilibrium. Required for economics and mathematical economic analysis majors. Pre-requisite(s): (ECON 211 and MATH 101) or (ECON 211 and MATH 111 and MATH 112). Limited enrollment. Offered Fall & Spring. Instructor(s): Bejan, J. Brown, de Coppel; Dudey.

**ECON 375 MACROECONOMIC THEORY (3)**

Micro-foundations of macroeconomic theory. Required for economics and mathematical economic analysis majors. Pre-requisite(s): ECON 370. Limited enrollment. Offered Fall & Spring. Instructor(s): Bryant; Cordoba.

**ECON 382 PROBABILITY AND STATISTICS (3)**

Study of probability theory and the central concepts and methods of statistics with applications to economics, marketing, and finance. Required for mathematical economic analysis majors; may substitute STAT 410 or 431. Cross-listed with STAT 310. Pre-requisite(s): ECON 211 and MATH 102.

**ECON 400 ECONOMETRICS (3)**

Survey of estimation and forecasting models. Includes multiple regression time series analysis. A good understanding of linear algebra is highly desirable. Required for mathematical economic analysis majors. Cross-listed with STAT 400. Pre-requisite(s): ECON 382 and (STAT 310) or STAT 331 and MATH 211 or MATH 355 or CAAM 335 or permission of instructor. Offered Spring. Instructor(s): B. Brown.

**ECON 403 SENIOR INDEPENDENT RESEARCH (3)**

Independent research project for seniors on an approved topic of their choice. Must be in one of the following Classification(s): Senior. Instructor permission required.

**ECON 404 SENIOR INDEPENDENT RESEARCH (3)**

Independent research project for seniors on an approved topic of their choice. Must be in one of the following Classification(s): Senior. Instructor permission required.

**ECON 415 LABOR ECONOMICS (3)**

This course studies empirical evidence and theories relating to several features of labor markets. Topics covered may include fertility, health, criminal behavior, labor force participation, hours of work, education and training, geographical and interfirm labor mobility, static and dynamic labor demand, unions, discrimination, government intervention in labor markets, and "hedonic" equilibria in labor markets. Prerequisite(s): ECON 370 and MATH 101. Offered Fall & Spring. Instructor(s): J. Brown.

**ECON 420 INTERNATIONAL TRADE (3)**

Study of the economic relationships between countries. Includes trade theory, tariffs and other trade restrictions, international finance, trade and development, and current policy issues. Pre-requisite(s): ECON 211 and ECON 370.

**ECON 421 INTERNATIONAL FINANCE (3)**

Analysis of foreign exchange and international capital markets and linkages between exchange rates, interest rates, and prices. Includes an overview of historical and institutional developments, and current policy issues. Pre-requisite(s): ECON 370 and ECON 375.

**ECON 435 INDUSTRIAL ORGANIZATION (3)**

Study of market structure, concentration, barriers to entry, and oligopoly pricing. Includes the application of micro theory to industry problems. Pre-requisite(s): ECON 370. Offered Spring. Instructor(s): Dudey.

**ECON 436 REGULATION (3)**

Analysis of governmental regulatory activities under antitrust laws and in such regulated industries as communications, energy, and transportation. Pre-requisite(s): ECON 370. Recommended prerequisite(s): ECON 435.

**ECON 437 ENERGY ECONOMICS (3)**

Discussion of key aspects in the supply and demand of energy. Topics include optimal extraction of depletable resources, transportation, storage, end-use, and efficiency, and the relationship between economic activity, energy, and the environment. Cross-listed with ENST 437. Pre-requisite(s): ECON 370 and ECON 375. Limited enrollment. Offered Fall. Instructor(s): Medlock.

**ECON 438 BUSINESS, LAW AND ECONOMICS (3)**

Exploration of the area of the law most applicable to business using economic tools. Pre-requisite(s): ECON 211. Limited enrollment. Offered Fall. Instructor(s): Boylan.

**ECON 439 TORTS, PROPERTY, AND CONTRACTS (3)**

The course will address the role of economics in understanding the legal system, in particular, understanding how the law allocates entitlements and risk in property, tort and contract law. This course is primarily intended for students who are considering attending law school and uses instruction methods appropriate for that goal. Pre-requisite(s): ECON 370. Limited enrollment. Offered Fall. Instructor(s): Brito.

**ECON 440 ADVANCED GAME THEORY (3)**

Choice under uncertainty and Von Neumann Morgenstern utility; games in normal form: mixed strategies, Nash equilibrium (existence and stability); games in extensive form: backward induction and other equilibrium refinements; games with incomplete information: Bayesian Nash equilibrium, application to signaling; cooperative games: the coalitional form, coalition formation and core stability, applications to exchange and bilateral Groves mechanisms. Pre-requisite(s): ECON 370. Recommended prerequisite(s): Familiarity with mathematical arguments and probability theory. Offered Spring. Instructor(s): Moulin.

**ECON 445 MANAGERIAL ECONOMICS (3)**

Application of economics to decision making within the firm. Includes organization theory and problems of control. A student may not receive credit for this course and ECON 348/POLI 348. Pre-requisite(s): ECON 370. Offered Spring. Instructor(s): Boylan.

**ECON 446 APPLIED ECONOMETRICS (3)**

Applied econometrics methods; focus will be on the application of econometrics and complementary measurement methodologies to modeling, forecasting, and hypothesis testing. Applications will include firm decision-making, testing for discrimination in the workplace, competition policy, portfolio management, and macroeconomic forecasting. Some knowledge of calculus is required. Prerequisite(s): ECON 211 and STAT 280. Offered Fall & Spring. Instructor(s): Brown, B.; Sickles.

**ECON 447 ADVANCED TOPICS IN ENERGY ECONOMICS (3)**

A more detailed treatment and analysis of topics in energy modeling. Topics include optimal extraction of depletable resources with uncertainty, energy demand by commodity and end-use sector, and the relationship between energy commodity prices. Graduate/Undergraduate version: ECON 547. Pre-requisite(s): ECON 437 and (ECON 400 or ECON 446). Recommended Pre-requisite: ECON 477 Instructor(s): Medlock.

**ECON 448 CORPORATE FINANCE (3)**

Study of financial theory and its application to practical problems in corporations. Covers the valuation of stocks and bonds, investment decisions, financing decisions, corporate control and the interaction between investment and financing decisions. Pre-requisite(s): ECON 370 and ACCO 305 and STAT 280 or permission of instructor. Offered Fall & Spring. Instructor(s): Hartley; Bejan.

**ECON 449 BASICS OF FINANCIAL ENGINEERING (3)**

This course covers the use of financial securities and derivatives to take or hedge financial risk positions. Most commonly used instruments, from simple forwards and futures to exotic options and swaptions are covered. The pricing of derivative securities will also be studied, but the emphasis will be on the mechanics and uses of financial engineering methods. Graduate/Undergraduate version: ECON 524. Pre-requisite(s): ECON 370 and MATH 221 and MATH 222 and STAT 310 or ECON 382 or ECON 400. Offered Spring. Instructor(s): El-Gamal.

**ECON 450 WORLD ECONOMIC AND SOCIAL DEVELOPMENT (3)**

Examines past and future development in advanced and poor countries, emphasizing resources, population, entrepreneurship, education, and planning. Pre-requisite(s): ECON 211 or permission of instructor.

**ECON 451 THE POLITICAL ECONOMY OF LATIN AMERICA (3)**

Examination of economic and political development, as well as, current policy, in contemporary Latin America. Includes a comparative analysis of selected countries, with emphasis on the interaction between public policies and economic outcomes. Pre-requisite(s): ECON 211. Offered Fall. Instructor(s): Soligo.

**ECON 452 RELIGION, ETHICS, AND ECONOMICS (3)**

Review economic models of the formation of religious groups and ethical norms, as well as, the interactions of religious beliefs and ethical norms with economic incentives and legal systems. Also, review recent debates on the role of ethics in corporate culture, especially in highly competitive industries and markets. Students will write term papers on topics of their choosing, subject to professor's approval. Pre-requisite(s): ECON 211. Limited enrollment.

**ECON 455 MONEY AND FINANCIAL MARKETS (3)**

Micro-foundation of monetary, fiscal and financial theory. Pre-requisite(s): ECON 370. Offered Spring. Instructor(s): Bryant.

**ECON 461 URBAN ECONOMICS (3)**

Deals with the nature and development of urban areas. The analytical sections of the course deal with the location of firms and households in an urban spatial context, the size distribution of urban areas, the theory of land rent, and optimal city size. Various urban problems such as poverty, racial segregation and discrimination, and pollution and environmental quality are discussed. Other policy questions deal with congestion tolls and efficient highway investment, land use regulation, central city fiscal problems, and alternative educational policies. Pre-requisite(s): ECON 211. Offered Fall. Instructor(s): Mieszowski.

**ECON 475 INTEGER PROGRAMMING (3)**

Modeling and solving optimization problems with discrete components, graphs and networks; network flow problems; minimum spanning trees; basic polyhedral theory; the knapsack problem; the plant location problem; the set packing problem; computational complexity, branch and bound; cutting planes; Lagrangian relaxation and Bender's decomposition. Cross-listed with CAAM 475. Pre-requisite(s): CAAM 378 or CAAM 464 or permission of instructor.

**ECON 477 MATHEMATICAL STRUCTURE OF ECONOMIC THEORY (3)**

This course acquaints students with constrained optimization techniques and other advanced tools used in modern economic theory including multivariate analysis, basic linear algebra, topology, convexity, fixed-point theorems, separation and dynamic optimization. The course concentrates on individual optimization. Two person zero sum games are discussed including their connection to duality in linear programming. Pre-requisite(s): ECON 211 and MATH 212 or MATH 221 and CAAM 335 or MATH 355. Offered Fall. Instructor(s): Brito.

**ECON 479 APPLIED GENERAL EQUILIBRIUM MODELING (3)**

Students will learn the theory of general equilibrium modeling and the details of a basic model (constructed using Matlab), and then use the model to analyze the efficiency, equity, and transitional effects of various policy options. Tax reform will be the primary application; others may include social security, debt policy, environmental policy, and energy policy. Pre-requisite(s): ECON 370.

**ECON 480 ENVIRONMENTAL AND ENERGY ECONOMICS (3)**

The economic theories of externalities and common property resources are used to analyze environmental problems. Regulation, taxes and subsidies, transferable pollution rights and legal solutions to environmental problems are evaluated. Environmental and other aspects of alternative energy sources are considered and the pricing of depletable energy resources is analyzed. Cross-listed with ENST 480. Pre-requisite(s): ECON 370 or permission of instructor. Offered Spring. Instructor(s): Hartley.

**ECON 481 HEALTH ECONOMICS (3)**

Study of determinants of health, including behavioral, economic and social factors and access to health care. Analysis of the medical care industry, production, cost, demand and supply factors. Effects of regulation and methods of payment. Pre-requisite(s): ECON 370 and ECON 382 or STAT 310 or ECON 400 or STAT 280 or STAT 305 or STAT 385. Limited enrollment. Offered Fall. Instructor(s): Ho.

**ECON 482 DISTRIBUTIVE JUSTICE: A MICROECONOMIC APPROACH (3)**

The course examines efficiency, fairness, and incentive-compatibility in problems involving trade and production. Topics include: equality, competitive trade; the No Envy test; Stand Alone test; the Shapley value; theories of the social contract such as utilitarianism and egalitarianism; including impossibility results of Arrow and Gibbard-Satterthwaite. Pre-requisite(s): ECON 370 or permission of instructor. Offered Fall. Instructor(s): Bogomolnaia.

**ECON 483 PUBLIC FINANCE: TAX POLICY (3)**

Economic analysis of tax policy, focusing on the current national debate regarding the relative merits of income and consumption-based taxes in terms of equity, efficiency, efficiency and simplicity. Tax effects on individual and business behavior and general equilibrium modeling of the economic and distributional effects of alternative tax reforms are analyzed. Special topics include optimal taxation of the family, estate taxation, taxation of electronic commerce, and state and local public finance. Pre-requisite(s): ECON 370 or permission of instructor.

**ECON 484 PUBLIC EXPENDITURE THEORY AND SOCIAL INSURANCE (3)**

Public goods theory including non-rival and congestible public facilities, theory of local public goods including the economics of education. The problem of preference revelation and the fundamentals of benefit-cost analysis. Analysis of the effects of social security, old age retirement, and the role of government in financing healthcare - Medicare and Medicaid. Pre-requisite(s): ECON 211.

**ECON 485 CONTEMPORARY ECONOMIC ISSUES (3)**

Analysis of urgent and significant economic problems, with emphasis on the evaluation of policy remedies. Content will vary from year to year.

**ECON 486 CONTEMPORARY ECONOMIC ISSUES (3)**

Analysis of urgent and significant economic problems, with emphasis on the evaluation of policy remedies. Content varies from year to year.

**ECON 495 SENIOR SEMINAR (3)**

Comprehensive analysis of economic issues related to a specific topic. Content will vary year to year.

**ECON 496 SENIOR SEMINAR (3)**

Comprehensive analysis of economic issues related to a specific topic. Content will vary year to year.

**ECON 501 MICROECONOMIC THEORY I (5)**

Theory of the firm, the theory of consumer behavior, and partial equilibrium analysis. Offered Fall. Instructor(s): Grant.

**ECON 502 MACROECONOMIC/MONETARY THEORY I (5)**

Macroeconomic theory of output, consumption, investment, interest rates, inflation and employment. Offered Fall. Instructor(s): Cordoba.

**ECON 504 ADVANCED ECONOMIC STATISTICS (5)**

Statistical inference and the testing of hypotheses multiple and partial correlation analysis; analysis of variance and regression. Cross-listed with STAT 604. Offered Fall. Instructor(s): Sickles.

**ECON 505 MACROECONOMIC/MONETARY THEORY II (5)**

More detailed discussion of selective Macroeconomic and Monetary topics. Offered Spring.

**ECON 506 TOPICS IN MACROECONOMIC/MONETARY THEORY (5)**

Discussion of selected topics of current interest. Repeatable for Credit. Offered Spring. Instructor(s): Cordoba.

**ECON 507 MATHEMATICAL ECONOMICS I (5)**

Theory of household, firm; activity analysis; set theory, matrix algebra, vector calculus, metric spaces, separation theory, constrained optimization. Offered Fall. Instructor(s): Bogomolnaia.

**ECON 508 MICROECONOMIC THEORY II (5)**

Set theoretic approach to general equilibrium; aggregate linear and nonlinear production models; existence, stability, optimality. Pre-requisite(s): ECON 501. Offered Spring. Instructor(s): Bejan.



**ECON 509 MICROECONOMICS III (5)**

Social choice and preference aggregation. Cardinal welfare Bargaining: axiomatic and strategic models. Cooperative games: core stability and coalition formation, Shapley value, cost and surplus sharing. Mechanism design: dominant strategy, strategy-proof voting, fair division, and cost sharing; implementation in Nash, Strong, and Bayesian Equilibrium. Pre-requisite(s): ECON 508. Offered Fall. Instructor(s): Bogomolnaia.

**ECON 510 ECONOMETRICS I (5)**

Estimation and inference in single equation regression models, multicollinearity, autocorrelated and heteroskedastic disturbances, distributed lags, asymptotic theory, and maximum likelihood techniques. Emphasis is placed on the ability to analyze critically the literature. Cross-listed with STAT 610. Prerequisite(s): ECON 504. Offered Spring. Instructor(s): El-Gamal.

**ECON 511 ECONOMETRICS II (5)**

Topics in linear and nonlinear simultaneous equations estimation, including qualitative and categorical dependent variables models and duration analysis. Applied exercises use SAS and the Wharton Quarterly Econometric Model. Cross-listed with STAT 611. Pre-requisite(s): ECON 510. Offered Fall. Instructor(s): Sickles.

**ECON 512 INTERNATIONAL TRADE THEORY (5)**

Exploration of classical, neoclassical, and modern trade theory. Includes welfare aspects of trade such as the theory of commercial policy, with emphasis on applications.

**ECON 514 INDUSTRIAL ORGANIZATION AND CONTROL (5)**

Industrial markets and public policy. Offered Fall. Instructor(s): Dudey.

**ECON 515 LABOR ECONOMICS (5)**

Exploration of the economics of the labor market and the economic implications of trade unions, with emphasis on major public policy issues.

**ECON 518 INTERNATIONAL MACROECONOMICS (5)**

Effects of fiscal and monetary policies on exchange rates and the current account and balance of payments. Includes exchange market efficiency, exchange rates and prices, LDC debt, and policy coordination.

**ECON 519 ECONOMIC GROWTH AND DEVELOPMENT (5)**

Analysis of theory and policy questions relating to the level and rate of economic development.

**ECON 521 PUBLIC FINANCE I (5)**

Theory of public goods and externalities, political mechanisms and public choice, theory of local public goods, cost-benefit analysis and project evaluation issues of income redistribution. Offered Spring. Instructor(s): Mieszkowski.

**ECON 522 PUBLIC FINANCE II (5)**

Study of the effects of taxation on individual and firm behavior, general equilibrium tax incidence analysis, optimal taxation theory, optimal implementation of tax reform, analysis of comprehensive income, and consumption taxes.

**ECON 523 DYNAMIC OPTIMIZATION (5)**

Study of dynamic optimization in discrete and continuous time.

**ECON 524 BASIC FINANCIAL ENGINEERING (5)**

Financial engineers design and analyze products that improve the efficiency of markets and create mechanisms for reducing risk. This course introduces the basics of financial engineering: the notions of arbitrage and risk-neutral probability measure are developed in the case of discrete models; Black-Scholes theory is introduced in continuous-time models, and interest rate derivatives and the term structure of interest rates are discussed. Stochastic processes, Ito calculus and diffusion models are used as basic analytical tools. Statistical methodologies to estimate and test the models commonly used in finance and financial engineering are also introduced. Graduate/Undergraduate version: ECON 449. Offered Spring. Instructor(s): El-Gamal.

**ECON 547 ADVANCED TOPICS IN ENERGY ECONOMICS (5)**

More detailed development and analysis of topics in energy modeling. Topics include optimal extraction of depletable resources with uncertainty, energy demand by commodity and end-use sector, and the relationship between energy commodity prices. Graduate/Undergraduate version: ECON 447. Pre-requisite(s): ECON 437 and (ECON 400 or ECON 446). Recommended Pre-requisite: ECON 477 Instructor(s): Medlock.

**ECON 565 HEALTH ECONOMICS (5)**

Study of economic aspects of health. Includes production, cost, demand and supply factors; methods of payment and effects of regulation. Offered Fall. Instructor(s): Ho.

**ECON 577 TOPICS IN ECONOMIC THEORY I (5)**

Discussion of topics in advanced economic theory. Repeatable for Credit. Offered Spring. Instructor(s): Grant and de Clippel.

**ECON 578 TOPICS IN ECONOMIC THEORY II (5)**

Discussion topics in advanced economic theory. Repeatable for Credit.

**ECON 579 TOPICS IN ECONOMETRICS (5)**

Discussion of selected topics in advanced econometrics. Pre-requisite(s): ECON 511. Repeatable for Credit. Offered Fall. Instructor(s): El-Gamal.

**ECON 592 TOPICS IN POLICY AND APPLIED ECONOMICS (5)**

Discussion of selected topics and applied economics. Repeatable for Credit.

**ECON 593 WORKSHOP IN MICROECONOMICS (5)**

Seminars on advanced topics in macroeconomics, microeconomics, econometrics and applied microeconomic theory, presented through guest lectures by leading researchers. Must be in one of the following Classification(s): Graduate. Repeatable for Credit. Offered Fall. Instructor(s): Cordoba; Moulin; B. Brown; Mieszkowski.

**ECON 594 WORKSHOP IN ECONOMICS I (5)**

Continuation of ECON 593. Repeatable for Credit. Offered Spring. Instructor(s): Cordoba; Grant; B. Brown; Mieszkowski.

**ECON 595 WORKSHOP IN ECONOMICS II (5)**

This is the second year continuation of ECON 593-594. Repeatable for Credit.

**ECON 597 READINGS IN ADVANCED TOPICS (5)**

Repeatable for Credit.

**ECON 598 READINGS IN ADVANCED TOPICS (5)**

Repeatable for Credit.

**ECON 800 GRADUATE RESEARCH (1 TO 12)**

Repeatable for Credit.

**EDUC (EDUCATION)****School of Humanities/Education****EDUC 202 CONTEMPORARY ISSUES IN EDUCATION (3)**

Exploration of current issues and controversies in education through research and primary experience. Requires a minimum of 14 hours of service or experience in K-12 schools, to be arranged individually. Directed to all students interested in issues of K-12 education, and recommended for those interested in entering the teacher preparation program. Graduate/Undergraduate version: EDUC 502. Offered Fall. Instructor(s): Radigan.

**EDUC 301 PHILOSOPHICAL, HISTORICAL, AND SOCIAL FOUNDATIONS OF EDUCATION (3)**

Analysis of events and ideas that have shaped the philosophy and practice of American schools today. Requires at least 15 hours of observation in secondary schools. Appropriate for all students interested in the influences and stresses that have created a unique educational system in our culturally diverse country. Required for certification unless EDUC 330 is substituted. Enrollment limited to students with junior status or higher. Graduate/Undergraduate version: EDUC 501. May not be in any of the following Classification(s): Freshman, Sophomore. Instructor(s): Coppola.

**EDUC 305 EDUCATIONAL PSYCHOLOGY (3)**

The goal of this course is to introduce students to a psychological understanding of teaching and learning through an overview of principles, issues, and related research in educational psychology. The course will examine theories of learning, complex cognitive processes, cognitive and emotional development, motivation, and the application of these constructs of effective instruction, the design of optimum learning environments, assessment of student learning, and teaching in diverse classrooms. It is a general overview of the field and requires no prior preparation. Required for certification. Enrollment limited to students with junior status and higher. Graduate/Undergraduate version: EDUC 505. May not be in any of the following Classification(s): Freshman, Sophomore. Limited enrollment.

**EDUC 310 INTRODUCTION TO SPECIAL EDUCATION (3)**

This course will introduce and expose students to the field of Special Education. Students will learn about the various individuals who receive special education as well as other types of exceptionality, including giftedness. Controversial issues in this field will be examined along with pertinent legislation. This course will familiarize students with instructional approaches in special education and the social issues impacting the field. Students will visit area schools. Recommended for certification. Graduate/Undergraduate version: EDUC 510. Offered Spring. Instructor(s): Ashmore.

**EDUC 325 ADOLESCENT LITERATURE (3)**

Cultural, literary, and developmental issues in literature written to engage middle and high school students. Recommended for certification. Graduate/Undergraduate version: EDUC 525. Instructor(s): McNeil.

**EDUC 330 THE AMERICAN HIGH SCHOOL (3)**

Survey of the background, purposes, and organization of modern secondary schools and their students and curricula. Includes the policy and administration of secondary schools as well as introductory educational research. 15 hours of observation in schools required. Required for certification unless EDUC 301 is substituted. Enrollment limited to students with junior status or higher. Graduate/Undergraduate version: EDUC 530. May not be in any of the following Classification(s): Freshman, Sophomore. Instructor(s): McNeil.

**EDUC 335 URBAN EDUCATION: ISSUES, POLICY, AND PRACTICE (3)**

Major issues facing urban education, including poverty, the implications of racial and ethnic diversity for educational institutions, and strategies for improving academic achievement in urban schools. We will examine sociological, political, cultural and educational research and theory, as well as explore strategies for improvement of urban education at the classroom, school and policy levels. Recommended for certification. Graduate/Undergraduate version: EDUC 535. Instructor(s): Radigan.

**EDUC 345 COMPUTERS IN EDUCATION (3)**

Technology is and will continue to be deeply involved in the education process. In this course, students will investigate and use computer applications to enhance classroom teaching and facilitate administrative tasks. We will explore relevant design alternatives for educational presentations and websites. The internet will be utilized as a teacher and student resource. Other related topics including copyright, networking, and computer systems will be included. Recommended for certification. Graduate/Undergraduate version: EDUC 545. Offered Spring. Instructor(s): White.

**EDUC 350 EDUCATION POLICY: FROM LEGISLATURES TO CLASSROOMS (3)**

Establish principles of policy analysis and then use those principles to investigate the effects of current educational policies, with particular attention to the dynamics and impact on schools, families, children, and communities. Recommended for certification. Graduate/Undergraduate version: EDUC 550. Offered Spring. Instructor(s): Coppola.

**EDUC 410 THEORY AND METHODS: ART (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530 or permission of instructor. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 411 THEORY AND METHODS: ENGLISH (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 412 THEORY AND METHODS: FOREIGN LANGUAGE (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 413 THEORY AND METHODS: MATHEMATICS (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 414 THEORY AND METHODS: PHYSICAL EDUCATION (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 415 THEORY AND METHODS: SCIENCE (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 416 THEORY AND METHODS: SOCIAL STUDIES (1 TO 3)**

Study of methods for putting theory into practice in the classroom. Includes multiple methods for educating students in our diverse society, reflection on, and practice of the skills of teaching applicable to the discipline. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Heckelman.

**EDUC 420 CURRICULUM DEVELOPMENT (3)**

Integration of theory with practice as students observes a mentor teacher, identify issues of developing and implementing curriculum with a diverse student body, and create curriculum for the Summer School for Grades 8 through 12. Students must be admitted to the Teacher Preparation Program and committed to student teaching in Summer School. Required for certification. Pre-requisite(s): EDUC 301 or EDUC 501 or EDUC 330 or EDUC 530. Instructor permission required. Repeatable for Credit. Offered Spring. Instructor(s): Heckelman.

**EDUC 440 SUPERVISED TEACHING: SUMMER SCHOOL (3)**

Field-based practicum for secondary teachers, with accompanying seminar. Required for certification. Pre-requisite(s): EDUC 420. Instructor permission required. Repeatable for Credit. Instructor(s): Heckelman.

**EDUC 490 PORTFOLIO DEVELOPMENT (1)**

Development of a portfolio demonstrating teaching strengths, which is required for teacher certification during the last summer of student teaching. Recommended for teacher certification. Instructor permission required. Offered Spring. Instructor(s): Heckelman.

**EDUC 491 INDEPENDENT STUDY AND RESEARCH (1 TO 3)**

Graduate/Undergraduate version: EDUC 591. Instructor permission required. Repeatable for Credit.

**EDUC 501 PHILOSOPHICAL, HISTORICAL, AND SOCIAL FOUNDATIONS OF EDUCATION (3)**

Graduate/Undergraduate version: EDUC 301. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Instructor(s): Coppola.

**EDUC 502 CONTEMPORARY ISSUES IN EDUCATION (3)**

Graduate/Undergraduate version: EDUC 202. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Instructor(s): Radigan.

**EDUC 505 EDUCATIONAL PSYCHOLOGY (3)**

Graduate/Undergraduate version: EDUC 305. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Limited enrollment.

**EDUC 510 INTRODUCTION TO SPECIAL EDUCATION (3)**

Graduate/Undergraduate version: EDUC 310. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Offered Spring. Instructor(s): Ashmore.

**EDUC 525 ADOLESCENT LITERATURE (3)**

Graduate/Undergraduate version: EDUC 325. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Offered Spring. Instructor(s): McNeil.

**EDUC 530 THE AMERICAN HIGH SCHOOL (3)**

Graduate/Undergraduate version: EDUC 330. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Instructor(s): McNeil.

**EDUC 535 URBAN EDUCATION: ISSUES, POLICY, AND PRACTICE (3)**

Graduate/Undergraduate version: EDUC 335. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Instructor(s): Radigan.

**EDUC 540 INTERNSHIP (3)**

Field practice for secondary teachers, with accompanying seminar. Pre-requisite(s): EDUC 440. Repeatable for Credit. Offered Fall. Instructor(s): Heckelman.

**EDUC 545 COMPUTERS IN EDUCATION (3)**

Graduate/Undergraduate version: EDUC 345. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Instructor(s): White.

**EDUC 550 EDUCATION POLICY: FROM LEGISLATURES TO CLASSROOMS (3)**

Establish principles of policy analysis and then use those principles to investigate the effects of current education policies, with particular attention to the dynamics and impact on schools, families, children, and communities. Graduate version of EDUC 350, additional assignments are required. Graduate/Undergraduate version: EDUC 350. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Offered Spring. Instructor(s): Coppola.

**EDUC 591 INDEPENDENT STUDY AND RESEARCH (1 TO 3)**

Graduate/Undergraduate version: EDUC 491. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Repeatable for Credit.

**EDUC 596 FIELD-BASED STUDIES IN TEACHING AND LEARNING (1 TO 3)**

Study of field-based ethnographic research on teaching and learning. Includes seminar, independent research projects, ethnographic research methods, and directed case studies. Open to upperclassmen and graduate students, particularly those in education, sociology, anthropology, and psychology. Offered as needed. May not be in any of the following Classification(s): Freshman, Junior, Sophomore, Senior. Limited enrollment. Instructor(s): McNeil.

**ELEC (ELECTRICAL & COMP. ENGINEERING)****School of Engineering/Electrical & Computer Engineering****ELEC 201 INTRODUCTION TO ENGINEERING DESIGN (4)**

This hands-on course immerses students in an engineering design and problem solving team process that exposes them to the challenges and rewards of practicing engineers. The course targets two groups. First, freshman and sophomores who are considering an engineering major but who want information on the principles of engineering design and the profession. Second, non-engineering majors who want to experience and understand the design process that creates the technology that permeates today's economy, society, and political decisions. Teams of three students design, construct, and program a small autonomous robot to engage in a competition at the end of the semester. The course is completely self-contained and assumes no prerequisites. Offered Fall. URL: [www.owlnet.rice.edu/legolab](http://www.owlnet.rice.edu/legolab). Instructor(s): Young.

**ELEC 220 FUNDAMENTALS OF COMPUTER ENGINEERING (4)**

An overview of computer engineering, starting with fundamental building blocks including transistors, bits, data representation, logic and state machines, progressing to computer organization, instruction sets, interrupts, input/output, assembly language programming, and linkage conventions, and ending with an introduction to architectural performance enhancements and computing services. Offered Spring. URL: [www.owlnet.rice.edu/~elec220](http://www.owlnet.rice.edu/~elec220). Instructor(s): Cavallaro.

**ELEC 226 MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY (3)**

Basic introduction to microcontroller-based embedded systems development. Includes structured laboratory exercises in: assembly programming, C language programming, peripheral interfacing, interrupt management, structured programming, task scheduling, simple digital signal processing (DSP), and other related topics. This course assumes no prerequisites and is primarily intended for first and second year engineering students. Not offered this academic year. URL: [wallaby.ece.rice.edu/elec226](http://wallaby.ece.rice.edu/elec226).

**ELEC 241 FUNDAMENTALS OF ELECTRICAL ENGINEERING I (4)**

The creation, manipulation, transmission, and reception of information by electronic means, elementary signal theory; time and frequency-domain analysis; sampling theorem. Digital information theory; digital transmission of analog signals; error-correcting codes. Laboratory demonstrating the principles of information management by electronic means. Offered Fall & Spring. Instructor(s): Johnson.

**ELEC 242 FUNDAMENTALS OF ELECTRICAL ENGINEERING II (4)**

Formulation and solution of equations describing electric circuits and electromechanical systems. Behavior of dynamic systems in the time and frequency domains. Basic electronic devices and circuits, including diodes, transistors, optoelectronics, gates, and amplifiers. Introduction to feedback control and digital systems. Pre-requisite(s): ELEC 241. Offered Spring. Instructor(s): Wise.

**ELEC 243 INTRODUCTION TO ELECTRONICS (4)**

Introduction to analog and digital circuit analysis and design. Basic circuit elements, transistors, OP Amps, digital devices and systems. Intended for non-majors. Pre-requisite(s): MATH 101 and MATH 102. Offered Spring. Instructor(s): Young.

**ELEC 261 ELECTRONIC MATERIALS AND QUANTUM DEVICES (3)**

An overview of fundamental topics in physical electronics including a semiclassical approach to the electrical, magnetic, and optical properties of materials as well as an introduction to quantum mechanics, atomic physics, crystal lattices, and electronic band structure. Offered Fall. URL: <http://www.ece.rice.edu/~kkelly/elec261>. Instructor(s): Kelly.

**ELEC 262 INTRODUCTION TO WAVES AND PHOTONICS (3)**

Introduction to the concepts of waves and oscillatory motion with a particular focus on electromagnetic waves and their interaction with dielectric materials, and on the use of these ideas in the fields of optical fiber communications, laser design, non-linear optics, and Fourier optics. Pre-requisite(s): PHYS 101 and PHYS 102. Offered Spring. URL: <http://www.ece.rice.edu/~daniel/262/262home.html>. Instructor(s): Mittleman.

**ELEC 301 INTRODUCTION TO SIGNALS (3)**

Analytical framework for analyzing signals and systems. Time and frequency domain analysis of continuous and discrete time signals and systems, convolution, and the Laplace and Z transforms. Prerequisite(s): ELEC 241. Recommended co or prerequisite(s): CAAM 335 or MATH 355. Offered Fall. Instructor(s): Baraniuk.

**ELEC 302 INTRODUCTION TO SYSTEMS (3)**

A study of linear dynamical systems based on state-space representation. Includes the structural properties of systems such as controllability and observability. About one third of the course is devoted to the study of linear algebraic concepts, like range, null space, eigenvalues diagonalizability. Applications to control problems. Pre-requisite(s): ELEC 301. Offered Spring. Instructor(s): Antoulas.

**ELEC 305 INTRODUCTION TO PHYSICAL ELECTRONICS (3)**

Study of the basic physical properties of electronics, semiconductors, transistors, integrated circuits, transmission line and signal propagation. Offered Fall.

**ELEC 306 ELECTROMAGNETIC FIELDS AND DEVICES (3)**

A course to introduce students to various electrical engineering aspects and devices based on electromagnetic field theory. Includes basic concepts of waveguides, resonators, optical fibers, waveguide devices, a survey of antennas, and a discussion of radar, lidar, and remote sensing principles. Pre-requisite(s): ELEC 305. Offered Spring. Instructor(s): Tittel.

**ELEC 322 APPLIED ALGORITHMS AND DATA STRUCTURE (4)**

Cross-listed with COMP 314. Offered Spring.

**ELEC 326 DIGITAL LOGIC DESIGN (3)**

Study of gates, flip-flops, combinational and sequential switching circuits, registers, logical and arithmetic operations, introduction to the Verilog hardware description language. Cross-listed with COMP 326. Prerequisite(s): ELEC 220. Offered Fall. URL: [www.ece.rice.edu/~kmram/elec326](http://www.ece.rice.edu/~kmram/elec326). Instructor(s): Mohanram.

**ELEC 327 IMPLEMENTATION OF DIGITAL SYSTEMS (3)**

This course concerns the implementation of digital systems using the Verilog hardware description language. Lecture topics include Verilog test benches and timing simulations and techniques for implementing control units, data-flow units, pipelining and interrupts. The course also requires the completion of a significant project involving the implementation of a modern instruction set architecture. Pre-requisite(s): ELEC 326. Offered Spring. Instructor(s): Jump.

**ELEC 331 APPLIED PROBABILITY (3)**

See STAT 331. Cross-listed with STAT 331. Offered Fall. Instructor(s): Kimmel.

**ELEC 342 ELECTRONIC CIRCUITS (4)**

Models of diodes, bipolar and field effect transistors. Biasing methods, distortion analysis, two-port analysis, single-stage and multistage amplifiers, frequency domain characteristics, feedback, stability, analog and digital power amplifiers. Lab culminates in the design and testing of a low-distortion audio frequency power amplifier. Pre-requisite(s): ELEC 242. Offered Spring.

**ELEC 361 QUANTUM MECHANICS FOR ENGINEERS (3)**

This course provides the background in quantum mechanics and solid state physics necessary for further studies in device physics (ELEC 462) and quantum electronics (ELEC 463). Pre-requisite(s): PHYS 202. Offered Spring. Instructor(s): Kono.

**ELEC 381 FUNDAMENTALS OF ELECTROPHYSIOLOGY (3)**

An introduction to the electrophysiology of excitable cells, and the development of mathematical models of their electrochemical activity. Forms the basis for a better understanding of clinical recordings of heart, brain and muscular activity (ECG, EEG, and EMG, respectively). Cross-listed with BIOE 381. Offered Fall. Instructor(s): Clark.

**ELEC 391 PROFESSIONAL ISSUES IN ELECTRICAL ENGINEERING (1)**

Issues related to engineering professional practice and other career choices for electrical engineering graduates. Topics will include intellectual property rights, engineering ethics, technical presentations, entrepreneurship, venture capitalism, career paths, and graduate study. Required for BSEE degree students. Offered Spring. URL: [www.ownet.rice.edu/~elec391/](http://www.ownet.rice.edu/~elec391/). Instructor(s): Sinclair.

**ELEC 420 DESIGN AND ANALYSIS OF ALGORITHMS (3)**

See COMP 482. Cross-listed with COMP 482. Offered Fall. Instructor(s): Greiner.

**ELEC 421 OPERATING SYSTEMS AND CONCURRENT PROGRAMMING (4)**

Introduction to the design, construction, and analysis of concurrent programs with an emphasis on operating systems, including filing systems, schedulers, and memory allocators. Specific attention is devoted to process synchronization and communication within concurrent programs. Cross-listed with COMP 421. Offered Spring. Instructor(s): Johnson.

**ELEC 422 VLSI SYSTEMS DESIGN (4)**

A study of VLSI technology and design. MOS devices, characteristics and fabrication. Logic design and implementation. VLSI design methodology, circuit simulation and verification. Pre-requisite(s): ELEC 326. Corequisite(s): ELEC 493. Offered Spring. Instructor(s): Massoud.

**ELEC 424 MOBILE AND EMBEDDED SYSTEM DESIGN AND APPLICATION (4)**

ELEC 424 introduces mobile and embedded system design and applications to undergraduate students and provides them hands-on design experience. It consists of three inter-learning parts: lectures, student design project, and student presentations. Student teams continue to work on the design project in the following semester as ELEC 494. Pre-requisite(s): AND ELEC 326. Limited enrollment. Offered Fall. URL: [www.ruf.rice.edu/~mobile/elec424/](http://www.ruf.rice.edu/~mobile/elec424/). Instructor(s): Zhong.

**ELEC 425 COMPUTER SYSTEMS ARCHITECTURE (4)**

Advanced uniprocessor system architecture. Advanced pipelining; dynamic scheduling, precise interrupt handling. Advanced techniques for exploiting instruction level parallelism; superscalar and VLIW architectures. Case studies of recent high-performance microprocessors. Vector and DSP processors. Memory system improvement-cache, virtual memory, and main memory enhancements. I/O performance enhancements. Introduction to parallel architectures. Cross-listed with COMP 425. Offered Fall. URL: [www.owl.net.rice.edu/~comp425](http://www.owl.net.rice.edu/~comp425). Instructor(s): Varman.

**ELEC 429 INTRODUCTION TO COMPUTER NETWORKS (4)**

Network architectures, algorithms and protocols. Local- and wide-area networking. Intra- and inter-domain routing. Transmission reliability. Flow and congestion control. TCP/IP. Multicast. Quality of Service. Network security. Networked applications. Cross-listed with COMP 429. Offered Spring. Instructor(s): Ng.

**ELEC 430 COMMUNICATION THEORY AND SYSTEMS (3)**

Course in digital communications, designed to prepare students for engineering work in high-tech industries and for graduate work in communications, signal processing, and computer systems. Covers basic concepts and useful tools for design and performance analysis of transmitters and receivers in the physical layer of a communication system. Pre-requisite(s): ELEC 331 and ELEC 301. Offered Spring. URL: [www.ece.rice.edu/courses/430/](http://www.ece.rice.edu/courses/430/). Instructor(s): Aazhang.

**ELEC 431 DIGITAL SIGNAL PROCESSING (3)**

Analysis of deterministic discrete-time signals and systems. Covers digital filter analysis and design, DSP algorithms such as the FFT and fast convolution, and wavelet based signal processing. Pre-requisite(s): ELEC 301. Offered Spring. Instructor(s): Burrus.

**ELEC 432 DIGITAL RADIO SYSTEM DESIGN (4)**

Analysis and design of digital radio communication systems including architectures, algorithms, hardware components, and system characterization. Must complete ELEC 494 to receive design credit for ELEC 432. Offered Fall. Instructor(s): Wise.

**ELEC 433 ARCHITECTURE FOR WIRELESS COMMUNICATIONS (3)**

This is an FPGA laboratory course in which students will embark upon a detailed study and implementation of digital communications systems. Major functional blocks of end-to-end wireless communication systems will be discussed, built, tested in hardware. Students will work in groups on weekly lab assignments and a major semester project. Pre-requisite(s): ELEC 430. Limited enrollment. Offered Fall & Spring. URL: [cmclab.rice.edu/433/](http://cmclab.rice.edu/433/). Instructor(s): Murphy.

**ELEC 434 DIGITAL SIGNAL PROCESSING LAB (3)**

Understand the architecture and software tools for code development and optimization of the Texas Instruments TMS320C6x digital signal processor family. Includes laboratory exercises such as digital filtering to demonstrate both fixed-point and floating-point DSPs. Use will also be made DSP Starter Kits (DSK-6416 and/or DSK-6713). Requires DSP term project of the student's choice. Pre-requisite(s): ELEC 321. Offered Fall. Instructor(s): Poland.

**ELEC 435 ELECTROMECHANICAL DEVICES AND SYSTEMS (3)**

Introduction to the physical and engineering aspects of electromechanical sensors and actuators, including underlying physical phenomena, practical devices, electrical and mechanical interfacing, and control of electromechanical systems. Cross-listed with MECH 435. Pre-requisite(s): ELEC 242 or ELEC 243. Offered Fall. Instructor(s): Wise.

**ELEC 436 FUNDAMENTALS OF CONTROL SYSTEMS (3)**

See MECH 420. Cross-listed with MECH 420.

**ELEC 437 INTRODUCTION TO COMMUNICATION NETWORKS (3)**

Introduction to design and analysis of communication networks. Topics include wireless networks, media access, routing traffic modeling, congestion control, and scheduling. Pre-requisite(s): ELEC 331 or STAT 331. Offered Fall. Instructor(s): Knightly.

**ELEC 438 WIRELESS NETWORKING FOR UNDER-RESOURCED URBAN COMMUNITIES (3)**

The Rice Networks Group and the non-profit organization Technology For All have recently deployed a state-of-the-art multi-hop wireless network in one of Houston's most economically disadvantaged neighborhoods. The objective of this network is to empower under-resourced communities with access to technology and educational and work-at-home tools. In this course, project teams will perform measurement studies both in the Rice Networks Lab and in the East End neighborhood to characterize the system capacity; optimize placement of wireless nodes; study the effects of traffic and channel characteristics on system-wide performance; and plan deployment of additional nodes to extend the coverage area. Offered Spring. Instructor(s): Knightly.

**ELEC 439 DIGITAL IMAGE PROCESSING (3)**

Modern techniques for image analysis, processing, and enhancement: two dimensional system and transform theory; sampling; linear and non-linear filtering; feature extraction; compression and coding; imaging systems. Pre-requisite(s): ELEC 431 or permission of instructor. Offered Spring. Instructor(s): Orchard.

**ELEC 440 ARTIFICIAL INTELLIGENCE (4)**

See COMP 440. Cross-listed with COMP 440. Offered Fall. Instructor(s): Subramanian.

**ELEC 446 MOBILE WIRELESS SERVICES PROJECT (3)**

Design and implement a wireless mobile information system utilizing Windows Mobile hardware (SMART Phone and PDA), Visual Studio.Net and .NET services to run over cellular data networks (EV-DO, EDGE) and the Rice 802.11b wireless infrastructure. Students will be provided with hardware, required software and access to a .NET server. Preferences given to students who have experience with Visual Studio or have taken COMP 314, or COMP 410, or COMP 415, or ELEC 694. Cross-listed with COMP 446. Pre-requisite(s): COMP 410 or COMP 415 or COMP 314 or ELEC 694 and COMP 415. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Cutler.

**ELEC 462 SEMICONDUCTOR DEVICES (4)**

Survey of physical principles and operational characteristics of semiconductor devices. Bipolar and MOS transistors. IC circuit fabrication. Offered Fall. Instructor(s): Kono.

**ELEC 463 LASER AND PHOTONICS (3)**

Introduction to the physics and technology of lasers and related devices. The course consists of lectures, homework, and student presentations on particular topics. Pre-requisite(s): PHYS 201 or ELEC 261. Offered Spring. URL: [www.ece.rice.edu/~young/elec463](http://www.ece.rice.edu/~young/elec463). Instructor(s): Young.

**ELEC 464 PHOTONIC SENSOR SYSTEM DESIGN (4)**

Presentation of the parameters and physics of using light to determine physical properties or state; principles and characteristics of photonic sources and detectors; team-based design of a photonic sensor system. Must complete ELEC 494 to receive design credit for ELEC 464. Pre-requisite(s): ELEC 493. Offered Fall. Instructor(s): Young.

**ELEC 465 PHYSICAL ELECTRONICS PRACTICUM (3)**

A laboratory course, with lecture, to introduce students to a variety of experimental techniques, methods, and instruments of current interest. The content will generally correspond to the ideas and concepts introduced in the Physical Electronics courses, ELEC 305, 306, 461, and 463, including: general optics; lasers and fiber optics; spectroscopy. Pre-requisite(s): PHYS 201 or ELEC 261. Offered Spring.

**ELEC 481 COMPUTATIONAL NEUROSCIENCE (3)**

An introduction to anatomy and physiology of the brain. Development of models of neurons and natural neural networks. Cross-listed with BIOE 481. Pre-requisite(s): ELEC 381. Not offered this academic year. Instructor(s): Clark.

**ELEC 482 PHYSIOLOGICAL CONTROL SYSTEMS (4)**

Nervous system control of biological systems using simulation methods, as well as techniques common to linear and nonlinear control theory. Examples from cardiovascular, respiratory, and visual systems. Cross-listed with BIOE 482. Offered Spring. Instructor(s): Clark.

**ELEC 485 FUNDAMENTALS OF MEDICAL IMAGING I (3)**

The course will introduce basic medical imaging modalities, such as x-ray, CT, and MRI, used to identify the anatomy of human organs, as well as other modalities, such as PET, SPECT, FMRI, and MEG, specifically developed to localize brain function. The course includes visits to clinical sites. Cross-listed with BIOE 485, COMP 485. Offered Fall. Instructor(s): Mawlawi.

**ELEC 486 FUNDAMENTALS OF MEDICAL IMAGING II (3)**

Course focuses on Positron Emission Tomography (PET) physical principles, image formation, processing, and clinical applications and lays the foundations for understanding PET tracer kinetic modeling. A trip to MD Anderson's PET facility provides hands-on experience of PET imaging. Cross-listed with BIOE 486, COMP 486. Pre-requisite(s): ELEC 485 or BIOE 485 or COMP 485. Offered Spring. Instructor(s): Mawlawi.

**ELEC 490 ELECTRICAL ENGINEERING RESEARCH PROJECTS (1 TO 6)**

Theoretical and experimental investigations under staff direction. May be repeated for a total of 6 credit hours. Repeatable for Credit. Offered Fall & Spring.

**ELEC 491 INDEPENDENT DESIGN PROJECT (3)**

Students who wish to pursue substantial, independent projects or participate in engineering design competitions should enroll in 491 as the first semester of their design sequence. All projects must be approved by the Undergraduate Curriculum Committee. Must complete ELEC 494 to receive design credit for ELEC 491. Instructor permission required. Offered Fall. Instructor(s): Wise.

**ELEC 493 SENIOR DESIGN SEMINAR (1)**

Covers design methodology, project planning, engineering documentation, and other design related topics. Required for all BSEE degree students. Recommended corequisite(s): Approved BSEE design electives. Offered Fall. Instructor(s): Wise.

**ELEC 494 SENIOR DESIGN LABORATORY (3)**

Team of students will specify, design, and build a system to meet a prescribed set of requirement. A substantial document and a formal presentation describing the design will be required. Required of all BSEE degree students. Offered Spring. Instructor(s): Wise; Young.

**ELEC 498 INTRODUCTION TO ROBOTICS (3)**

Cross-listed with COMP 498, MECH 498.



**ELEC 501 APPROXIMATION OF DYNAMICAL SYSTEMS (3)**

This course describes projection methods for model reduction that seek to replace scale systems (VLSI circuits, weather prediction models, and MEMS) with systems of computational complexity that the original dynamical system requires while still maintaining model fidelity. Offered Spring. Instructor(s): Antoulas.

**ELEC 502 NEURAL NETWORKS AND INFORMATION THEORY I (3)**

Review of major Artificial Neural Network paradigms. Analytical discussion of supervised and unsupervised learning. Emphasis on state-of-the-art Hebbian (biologically most plausible) learning paradigms and their relation to information theoretical methods. Applications to data analysis such as pattern recognition, clustering, classification, blind source separation, non-linear PCA. Cross-listed with COMP 502. Pre-requisite(s): ELEC 430 and ELEC 431. or equivalent or permission of instructor. Offered Spring. URL: [www.ece.rice.edu/~erzsebet/ANNcourse.html](http://www.ece.rice.edu/~erzsebet/ANNcourse.html). Instructor(s): Merenyi.

**ELEC 507 NON LINEAR DYNAMIC SYSTEMS ANALYSIS (3)**

Analytical methods, including singular point and phase plane analysis, describing functions, stability analysis via Lyapunov functions; digital computer simulation methods; parameter estimation and sensitivity analysis is included. An introduction to the chaotic behavior of nonlinear dynamic systems is included.

**ELEC 508 NONLINEAR SYSTEMS: ANALYSIS AND CONTROL (3)**

Mathematical background and fundamental properties of nonlinear systems: Vector norms, matrix norms, matrix measures, existence and uniqueness of solutions of ordinary differential equations. Linearization, second order systems, periodic solutions, approximate methods. Lyapunov stability: Stability definitions, Lyapunov's direct method, invariance theory, stability of linear systems, Lyapunov's linearization method, converse theorems. Selected topics in nonlinear systems analysis and nonlinear control from: Input/Output stability: Small gain theorem, passivity theorem. Perturbation theory, averaging, and singular perturbations Feedback linearization control. Other methods in the control of nonlinear systems such as back-stepping, sliding mode and other Lyapunov-based design methods. Advanced nonlinear and adaptive robot control. Cross-listed with CAAM 508, MECH 508. Not offered this academic year. URL: [www/pw/met/roce/edi~mech508](http://www/pw/met/roce/edi~mech508).

**ELEC 519 PARALLEL ALGORITHMS AND ARCHITECTURE (3)**

The course provides a broad overview of instruction, data, thread, and stream models of parallelism, system architecture of parallel computers, scaleable multi processors, parallel storage architectures, and interconnection structures. The course also deals with the design and analysis of parallel algorithms, performance metrics, and programming issues. A brief introduction to parallel computing models based on Quantum or DNA computing is included. Cross-listed with COMP 583. ELEC 425 or COMP 425. Offered Spring. Instructor(s): Varman.

**ELEC 520 DISTRIBUTED SYSTEMS (4)**

See COMP 520. Cross-listed with COMP 520. Offered Fall.

**ELEC 521 HIGH PERFORMANCE NANOSCALE SYSTEMS (3)**

This course gives an overview of the critical issues in the design of high performance Nanoscale circuits and systems. This course focuses on the modeling and design automation of high performance CMOS circuits. The course covers scaling trends in CMOS technologies, interconnect modeling, power modeling, noise in digital CMOS circuits, high-performance CMOS design high performance clock distribution design, electro migration and thermal effects and power distribution. The course also addresses emerging Nano Devices such as carbon-nanotube and nanophotonic based devices and interconnects. Pre-requisite(s): ELEC 326. Offered Spring. Instructor(s): Massoud.

**ELEC 522 ADVANCED VLSI DESIGN (3)**

Design and analysis of algorithm-specific VLSI processor architectures. Topics include the implementation of pipelined and systolic processor arrays. Techniques for mapping numerical algorithms onto custom processor arrays. Course includes design project using high-level VLSI synthesis tools. Pre-requisite(s): ELEC 424. Offered Fall. URL: [www.ownet.rice.edu/~elec522](http://www.ownet.rice.edu/~elec522). Instructor(s): Cavallaro.

**ELEC 523 COMPUTER-AIDED DESIGN FOR VLSI (3)**

Fundamental topics in computer-aided design for VLSI-Logic synthesis and formal verification, timing analysis and optimization, technology mapping, logic and fault simulation, testing, and physical design will be covered. Relevant topics in algorithms and data structures, generic programming, and the C++ standard template library will also be covered. Cross-listed with COMP 523. Offered Fall. URL: [www.ece.rice.edu/~kmram/elec523](http://www.ece.rice.edu/~kmram/elec523).

**ELEC 524 MOBILE AND WIRELESS NETWORKING (3)**

Study of network protocols for mobile and wireless networking, particularly at the media access control, network, and transport protocol layers. Focus is on the unique problems and challenges presented by the properties of wireless transmission and host or router mobility. Cross-listed with COMP 524. Offered Fall. Instructor(s): Johnson.

**ELEC 525 ADVANCED MICROPROCESSOR ARCHITECTURE (4)**

See COMP 525. Cross-listed with COMP 525. Pre-requisite(s): ELEC 425 or COMP 425. Offered Spring. Instructor(s): Rixner.

**ELEC 526 HIGH-PERFORMANCE COMPUTER ARCHITECTURE (4)**

Design of high performance computer systems, including shared-memory and message-passing multiprocessors and vector systems. Hardware and software techniques to tolerate and reduce memory and communication latency. Case studies and performance simulation of high-performance systems. Cross-listed with COMP 526. Pre-requisite(s): ELEC 525 or COMP 525 or permission of instructor. Not offered this academic year.

**ELEC 527 COMPUTING DESIGN WITH NANOTECHNOLOGIES (3)**

CMOS transistors, building elements of modern computing are entering the nanometer era. This course aims at providing basic knowledge of nanotechnologies-based computing. It starts with addressing immediate challenges facing CMOS-based computing. It then covers emerging non-standard CMOS and non CMOS devices, their physical properties, fabrications, circuit design, and impacts on the existing design flow and computing paradigms. Limited enrollment. Offered Spring. URL: [webdb.ece.rice.edu/elec527](http://webdb.ece.rice.edu/elec527). Instructor(s): Zhong; Tour.

**ELEC 528 SECURITY TOPICS OF EMBEDDED SYSTEMS (3)**

The strategic goal of this course is to prepare students for synthesis and evaluation of secure devices and systems. The main technical objectives include understanding of security and DRM such as nondestructive observability, hiding information inside systems, attack mechanisms identification, analysis and understanding. Offered Fall. URL: [www.ece.rice.edu/~fk1/](http://www.ece.rice.edu/~fk1/). Instructor(s): Koushanfar.

**ELEC 529 COMPUTER NETWORK PROTOCOLS AND SYSTEMS (4)**

See COMP 529. Cross-listed with COMP 529. Pre-requisite(s): COMP 429 or ELEC 429. Offered Fall.

**ELEC 530 DETECTION THEORY (3)**

Classic and modern methods of optimal decisions in communications and signal processing. Continuous- and discrete-time methods. Gaussian and non-Gaussian problems. Offered Spring. Instructor(s): Johnson.

**ELEC 531 STATISTICAL SIGNAL PROCESSING (3)**

Statistical models for single- and multi-channel signals. Optimal detection and estimation solutions for Gaussian and non-Gaussian environments. Pre-requisite(s): ELEC 431. Corequisite(s): ELEC 533. Offered Spring. Instructor(s): Johnson.

**ELEC 532 WAVELET AND SPECTRAL ANALYSIS (3)**

Classical and modern techniques for characterizing the frequency content of signals. Periodogram; parametric techniques, including autoregressive (AR) and autoregressive moving average (ARMA) modeling; nonparametric techniques, including minimum variance and eigenspace methods, and time-varying spectral analysis. Cross-listed with STAT 586. Offered Spring. Instructor(s): Baraniuk.

**ELEC 533 INTRODUCTION TO RANDOM PROCESSES AND APPLICATION (3)**

Review of basic probability; Sequence of random variables; Random vectors and estimation; Basic concepts of random processes; Random processes in linear systems, expansion of random processes; Wiener filtering; Spectral representation of random processes; White-noise integrals. Cross-listed with CAAM 583, STAT 583. Offered Fall. Instructor(s): Merenyi.

**ELEC 534 WIRELESS COMMUNICATIONS (3)**

This is a graduate course on wireless and mobile communication systems, with an emphasis on understanding the unique characteristics of these systems--their analysis and design. Topics include: cellular principles, mobile radio propagation and path loss, characterization of multipath fading channels, modulation and equalization techniques for mobile radio systems, multiple (media) access, Code Division Multiple Access (CDMA) system design, and cellular system capacity. Pre-requisite(s): ELEC 430. Offered Fall. URL: [www.ece.rice.edu/courses/534](http://www.ece.rice.edu/courses/534). Instructor(s): Aazhang.

**ELEC 535 INFORMATION AND CODING THEORY (3)**

Introduction to information theory concepts; basic theorems of channel coding and source coding with a fidelity criterion. Techniques of channel coding, parity check codes, introduction to algebraic coding theory, introduction to convolutional codes. Variable-length source coding. Pre-requisite(s): ELEC 331. Offered Spring. Instructor(s): Johnson.

**ELEC 536 APPLICATIONS OF MODERN STATISTICAL LEARNING THEORY IN EMBEDDED SYSTEMS AND NETWORKS (3)**

The course covers a broad range of statistical modeling and learning methods that find usage in embedded systems, distributed embedded systems and modern processes.

**ELEC 537 COMMUNICATION NETWORKS (3)**

Graduate-level introduction to design and analysis of communication networks. Topics include wireless networks, media access, routine, traffic modeling, congestion control, and scheduling. Cross-listed with MECH 537. Offered Fall. Instructor(s): Knightly.

**ELEC 538 ADVANCED TOPICS IN COMPUTER NETWORKING (3)**

Advanced topics in protocols, modeling, and analysis of wireless networks. Pre-requisite(s): ELEC 533 and ELEC 534 and ELEC 537. Instructor(s): Knightly.

**ELEC 539 DIGITAL IMAGE PROCESSING (3)**

Modern techniques for image analysis, processing, and enhancement: Two dimensional system and transform theory; sampling; linear and non-linear filtering; feature extraction; compression and coding; imaging systems. Instructor(s): Orchard.

**ELEC 540 SOURCE CODING AND COMPRESSION (3)**

Review of information theory, scalar quantization, vector quantization theory, scalar quantization, vector quantization, quantizer Design Algorithms, Entropy coding, transform coding, rate-distortion optimization application to image and video coding, wavelet and multi-resolution compression algorithms. Instructor(s): Orchard.

**ELEC 541 ERROR CORRECTING CODES (3)**

Introductory course on error correcting codes. Topics covered include linear block codes, convolutional codes, turbo codes and space-time codes. Pre-requisite(s): ELEC 430. Instructor(s): Sabharwal.

**ELEC 542 DIGITAL AUDIO AND VIDEO SYSTEMS (3)**

This course covers practical audio and video system design techniques and DSP architectures for implementing real time video and audio algorithms. Topics: A&V circuit and system design fundamentals, digital audio amplifiers, digital audio algorithms, DSP architectures, NTSC and HDTV video systems, MPEG video algorithms, HDTV receiver design and personal video recorder design. Pre-requisite(s): ELEC 302 or ELEC 431. Offered Spring. Instructor(s): Tran.

**ELEC 545 THIN FILMS (3)**

See MSCI 545. Cross-listed with MSCI 545.

**ELEC 560 INTEGRATED AND FIBER OPTICS (3)**

A seminar course consisting of lectures, discussions of journal articles, and student presentations on topics in optical fiber propagation, including linear and nonlinear effects. Pre-requisite(s): ELEC 306. Not offered this academic year. Instructor(s): Halas.

**ELEC 562 SUBMICROMETER AND NANOMETER DEVICE TECHNOLOGY (3)**

Surveys techniques to design, fabricate, and analyze submicron and nanometer structures with emphasis on applications in microelectronics, microphotonics, information storage and nanotechnology. Offered alternate years. Instructor(s): Kelly.

**ELEC 563 INTRODUCTION TO SOLID STATE PHYSICS I (3)**

See PHYS 563. Cross-listed with PHYS 563. Offered Fall.

**ELEC 564 SOLID-STATE PHYSICS II (3)**

See PHYS 564. Cross-listed with PHYS 564.

**ELEC 568 LASER SPECTROSCOPY (3)**

Introduction to the theory and practice of laser spectroscopy as applied to atomic and molecular systems. The course covers fundamentals of spectroscopy, lasers and spectroscopic light sources, high resolution and time resolved laser spectroscopy with applications in atmospheric chemistry, environmental science and medicine. Repeatable for Credit. Offered Fall. Instructor(s): Tittel.

**ELEC 569 ULTRAFAST OPTICAL PHENOMENA (3)**

This course covers the generation, propagation, and measurement of short laser pulses, of duration less than one picosecond. Concepts include mode locking, the effects of dispersion, optical pulse amplification, and time-domain non-linear optical phenomena. Intended as an introduction to ultrafast phenomena for graduate students or advanced undergraduates; a basic understanding of electromagnetic waves and of quantum mechanics is assumed. Cross-listed with PHYS 569. Offered Spring. URL: [www.ece.rice.edu/~daniel/569/569files.html](http://www.ece.rice.edu/~daniel/569/569files.html). Instructor(s): Mittleman.

**ELEC 570 ADVANCED TOPICS IN LASER SPECTROSCOPY (3)**

Advanced topics in Laser Spectroscopy with an emphasis on recent spectroscopic and chemical sensing research publications. Format will include a combination of lectures and student presentations. Offered Spring. Instructor(s): Tittel. Offered Spring. Instructor(s): Tittel.

**ELEC 571 IMAGING AT THE NANOSCALE (3)**

A survey of the techniques used in imaging submicron and nanometer structures with an emphasis on applications in chemistry, physics, biology, and materials science. The course includes an introduction to scanning probe microscopy and single photon counting including STM, AFM, NSOM, and confocal microscopy, as well as discussions on the fundamental and practical aspects of image acquisition, analysis, and artifacts. Offered Spring. URL: <http://www.ece.rice.edu/~kkelly/elec571>. Instructor(s): Kelly.

**ELEC 581 CARDIOPULMONARY DYNAMICS (3)**

Mathematical modeling of the cardiovascular and respiratory systems, and their neural control. Integration of these system models into a human cardiopulmonary model capable of simulating measured data from functional tests. Cross-listed with BIOE 581. Offered Fall. Instructor(s): Clark.

**ELEC 590 ELECTRICAL PROJECTS (1 TO 6)**

Theoretical and experimental investigations under staff direction. Repeatable for Credit. Offered Fall & Spring.

**ELEC 599 FIRST YEAR GRAD STUDENT PROJECTS (6)**

Supervised project required of all first-year graduate students in the Ph.D. program. Offered Fall & Spring.

**ELEC 602 NEURAL NETWORKS AND INFORMATION THEORY II (3)**

Advanced topics in ANN theories, with a focus on Self-Organizing Maps and unsupervised learning. The course will be a mix of lectures and seminar discussions with active student participation, based on most recent research publications. Students will have access to professional software environment to implement theories. Cross-listed with COMP 602. Limited enrollment. Instructor(s): Merenyi.

**ELEC 603 TOPICS IN NANOPHOTONICS (2)**

This course is a seminar where all IGERT students and their advisors meet to discuss research problems both in formal presentations and in an informal "open-mic" session. This course also includes a Nanophotonics journal club featuring just-published papers. All IGERT students will be enrolled in this seminar throughout the course of their graduate study. Repeatable for Credit. Offered Fall. Instructor(s): Halas.

**ELEC 605 COMPUTATIONAL ELECTRODYNAMICS AND NANOPHOTONICS (3)**

See PHYS 605. Cross-listed with PHYS 605. Repeatable for Credit. Offered Fall.

**ELEC 631 ADVANCED TOPICS IN SIGNAL PROCESSING (3)**

Topics vary from semester to semester. Pre-requisite(s): ELEC 531 and ELEC 533. Repeatable for Credit. Offered Fall.

**ELEC 632 ADVANCED TOPICS IN IMAGE AND VIDEO PROCESSING (3)**

Seminar on topics of current research interest in image and video processing. Students participate in selecting and presenting papers from technical literature. Discussions aim at identifying common themes and important trends in the field. Instructor(s): Orchard.

**ELEC 693 ADVANCED TOPICS-COMPUTER SYSTEMS (1 TO 15)**

Repeatable for Credit.

**ELEC 694 FUTURE PERSONAL COMPUTING TECHNOLOGIES (3)**

Survey of the component and standards trends that are the basis of personal computers and digital appliances with the aim of predicting technologies, solutions, and new products five years into the future. Cross-listed with COMP 694. Repeatable for Credit. Limited enrollment. Offered Spring. URL: [www.ece.rice.edu/courses/694.html](http://www.ece.rice.edu/courses/694.html). Instructor(s): Cutler.

**ELEC 695 ADVANCED TOPICS IN COMMUNICATIONS AND STATISTICAL SIGNAL PROCESSING (3)**

This is a graduate seminar class focused on the role of information theory in engineering wireless network. Students will survey, read, and present both classic as well as recent papers in the area. Prerequisite(s): ELEC 534 and ELEC 535. Instructor permission required. Instructor(s): Sabharwal.

**ELEC 696 COMPUTER ARCHITECTURE SEMINAR (1)**

COMPUTER ARCHITECTURE SEMINAR \*\*\*\*\* Discussion of recent research papers in computer architecture and current computer architecture at Rice. May be repeated for credit. \*\*\*\*\* Instructor(s): Pai, Rixner Repeatable for Credit.

**ELEC 760 BAYLOR/RICE MD/PHD PROGRAM (3)**

Department permission required. Repeatable for Credit. Offered Fall.

**ELEC 800 RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall & Spring.

**ENGI (ENGINEERING)****School of Engineering/Engineering Division****ENGI 205 TOPICS IN GLOBAL LEADERSHIP & TECHNOLOGY (3)**

Preparatory course for the ten-day INNOVATE conference, with an emphasis on leadership development and focus on how technology has driven globalization in Asia. Pre-trip activities will include lectures and colloquia on relevant topics specific to the destination countries. Post-trip requirements include a final report and presentation of relevant topical research at the annual INNOVATE Symposium to share their experience with the Rice community. Limited enrollment.

**ENGI 303 ENGINEERING ECONOMICS AND MANAGEMENT (3)**

Introduction to the evaluation of alternative investment opportunities with emphasis on engineering projects and capital infrastructure. Time value of money concepts are developed in the context of detailed project evaluation and presentations. In addition, concepts and applications of risk analysis and investment under uncertainty are developed. Requires oral and written presentations by students. Cross-listed with CEVE 322.

**ENGI 501 TEACHING ENGINEERING (3)**

A graduate seminar on the issues, principles, and practices associated with effective teaching of engineering. Workshops, speakers, and readings on pedagogy, course design, learning styles, active learning, use of technology, and testing. Students will develop a teaching portfolio and, in teams, develop a course module covering a topic. Instructor permission required. Limited enrollment. Instructor(s): Young.

**ENGI 610 MANAGEMENT FOR SCIENCE AND ENGINEERING (3)**

This course is for graduate and undergraduate students who want to understand the basics of management in new and/or small technology-based businesses and is particularly relevant to students who are interested in careers in technology or entrepreneurial ventures. NSCI 610/ENGI 610 is team taught to provide insight into how technology oriented firms manage people, projects, accounting, marketing, strategy, intellectual property, organizations and entrepreneurship. Student's active participation is essential. Student's who take this course are eligible for MGMT 625. Limited enrollment. Offered Fall. Instructor(s): Wilkinson; Barron.

**ENGL (ENGLISH)****School of Humanities/English****ENGL 103 INTRODUCTION TO ARGUMENTATION AND ACADEMIC WRITING (3)**

An introduction to writing in the academic disciplines that prepares students for more advanced work. Topics may include: identifying argument patterns, using online databases, practicing heuristic techniques, revising and editing papers according to the conventions of formal written English, and using MLA and APA documentation systems. Limited to student who receive a no pass on the composition exam. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 121 AP CREDIT IN ENGLISH (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ENGL 122 AP CREDIT IN ENGLISH (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ENGL 175 GLOBAL LITERATURES IN ENGLISH (3)**

An introduction to global literary studies and critical writing in which students study a range of literatures in English. The subject is twentieth-century modernism and its successors; postmodernism; and post-colonialism. Limited enrollment. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 200 SEMINAR IN LITERATURE AND LITERARY ANALYSIS (3)**

A course designed for and required of all prospective English majors. Emphasis is on close reading, literary interpretation, and critical writing. Attention is paid to the major genres (poetry, drama, and fiction) across a range of historical periods. Limited enrollment. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 201 INTRODUCTION TO CREATIVE WRITING: PERSONAL ESSAY (3)**

According to one book reviewer, nonfiction in the personal essay, the memoir and autobiography--is the reigning genre of our time. This turn of events has been applauded as well as lamented, according to the taste of the writer/reviewer/person. Nonfiction readers and writers are proliferating. In this course, we will join in this lively conversation by reading the works of published and prize-winning essayists and memoirists. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Recknagel.

**ENGL 209 GREEK AND ROMAN DRAMA (3)**

Reading, in translation, and dramatic analysis of representative plays, including works by Aeschylus, Sophocles, Euripides, Plautus, Terence, and Seneca. Cross-listed with CLAS 209. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 210 MAJOR BRITISH WRITERS: CHAUCER TO 1800 (3)**

Readings of representative British authors of the Middle Ages, the Renaissance, and the 18th century. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 211 MAJOR BRITISH WRITERS: 1800 TO PRESENT (3)**

Readings of representative British authors of the 19th and 20th centuries. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 215 WORDS IN ENGLISH: STRUCTURE, HISTORY, USE (3)**

An introduction to the study of English words, focusing on their internal structure and the nature and history of English vocabulary. Aims are to enhance knowledge of the rich lexical resources of the language, and to facilitate the acquisition of scientific, technical, legal, and humanistic vocabulary. No previous linguistics background required. Cross-listed with LING 215. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 260 INTRODUCTION TO THE STUDY OF AMERICAN LITERATURE (3)**

Readings of representative U.S. authors from the 18th century to the present. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 266 ETHNIC LITERATURES OF 20TH CENTURY AMERICA (3)**

A comparative study of U.S. minority literatures. Discussion will focus on the themes such as immigration, citizenship, and nationalism and on critical categories such as race, class, and gender. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 269 MURDER AND UNBELONGING IN THE LITERARY IMAGINATION (3)**

A comparative introduction to literatures from a variety of national traditions focused on a single theme. Past topics have included "Murder and Unbelonging". Cross-listed with SWGS 269.

**ENGL 270 ASPECTS OF MODERN LITERATURE (3)**

An introduction to modern/postmodern culture that may include readings of novels, plays, short stories, poems, psychoanalytic theory, and art criticism/philosophy. The emphasis is on reading and interpreting different kinds of texts in broad cultural contexts. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 272 LITERATURE AND MEDICINE (3)**

Designed for, but not limited to, students interested in the medical profession, this course introduces the study of medicine through reading imaginative literature--novels, plays, essays, poems--by and about doctors and patients, focusing on understanding ethical issues and on developing critical and interpretive skills. Limited enrollment. URL: [english.rice.edu](http://english.rice.edu).

**ENGL 273 MEDICINE AND MEDIA (4)**

An interdisciplinary exploration of the role of imaging technologies in the practice of medicine, and the role of mass media in shaping our understandings of the body, health, and disease. This course examines how visual media structure "ways of seeing" for physicians and for the public. Emphasis will be placed on developing media literacy skills. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 275 INTRODUCTION TO FILM: FILM CRITICISM (4)**

A writing-intensive course that teaches students to view films analytically and to write film criticism. Each week, students will view a film, read criticism of that film, and write their own review of the film. Screenings will be taken from important movements in world cinema history. Cross-listed with HART 285. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Ostherr.

**ENGL 286 CLASSICAL AND CONTEMPORARY FILM THEORY (3)**

This course introduces the student to approaches to understanding and interpreting film as film. It traces the attempts to grasp the new medium in theoretical terms from its origins to the present day. Topics include: montage, mise-en-scene, the gaze, history, psychoanalysis, and feminism. Cross-listed with HART 286. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 300 PRACTICES OF LITERARY STUDY: READING METHODS (3)**

A course that identifies and explores key concepts of recent critical writing. Students read short texts of contemporary theory and discuss the relation between theory and literature. Required for English majors. Limited enrollment. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 301 CREATIVE WRITING: FICTION WRITING (3)**

A course that teaches the fundamentals of fiction writing, and includes a mixture of reading and writing assignments. The goal is for each student to produce two short stories possessing imaginative ingenuity, structural integrity, and literary merit by the end of the semester. Offered Fall & Spring. URL: [www.ruf.rice.edu/~jccronin/301/index.html](http://www.ruf.rice.edu/~jccronin/301/index.html).

**ENGL 303 DRAMATIC WRITING (3)**

A course that focuses on writing for the chief modes of the performing arts: plays; film or television screenplays; musicals; opera; or dance. This workshop will be tailored to student interests. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 304 INTRODUCTION TO POETRY WRITING (3)**

An introduction to poetry writing through the study of contemporary poets and the writing of poems. The class will pay extensive attention to such elements of poetry as imagery, figurative language, tone, syntax, and form in order to create a vocabulary for students to discuss their own poems. Students' poems will be critiqued by the class in a workshop setting. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 305 CREATIVE WRITING: PERSONAL ESSAY (3)**

A course in the writing and interpretation of the personal essay and other autobiographical forms. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 306 EXPOSITORY PROSE (3)**

A course in which students write a sequence of short essays on the subjects of their own choosing. In the process, they experience how elements like structure, voice, figurative language and style contribute to rhetorical effectiveness. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 307 MEDICAL/TECHNICAL COMMUNICATION (3)**

A course in physician-patient communication. It also builds skills in writing and oral presentation to help students prepare for medical school. May not be in any of the following Classification(s): Freshman. Repeatable for Credit. URL: [english.rice.edu](http://english.rice.edu). Instructor(s): Tobin; Driskill.

**ENGL 309 MYTHOLOGIES (3)**

An interdisciplinary course introduces students to world mythologies, mythmakers and their cultures, from the beginnings to the modern period. Included mythologies: Babylonian, Sumerian, Hindu, Egyptian, Greek, Roman, Irish, Old Norse, Anglo-Saxon, Finnish, Mayan, Hopi, modern (Glass, Borges, "Whale Rider"). Cross-listed with MDST 368, SWGS 368. URL: [www.ruf.rice.edu/~jchance/myth.htm](http://www.ruf.rice.edu/~jchance/myth.htm). Instructor(s): Chance.

**ENGL 310 DANTE (3)**

A close reading of Dante's "Divine Comedy", with attention to the meaning of words, images, symbols, figures, structures, and the epic itself, with reference to the political/religious controversies of the time. Cross-listed with MDST 310. URL: [www.ruf.rice.edu/~jchance/dante.pdf](http://www.ruf.rice.edu/~jchance/dante.pdf). Instructor(s): Chance.

**ENGL 311 MEDIEVAL WOMEN WRITERS (3)**

This course will examine the most significant medieval European women authors from the 10th-17th centuries. We will combine close reading with a focus on intertextuality to recover a feminized literary tradition. Cross-listed with MDST 300, SWGS 300. URL: [www.ruf.rice.edu/~jchance/mewom.htm](http://www.ruf.rice.edu/~jchance/mewom.htm). Instructor(s): Chance.

**ENGL 313 BEOWULF (3)**

A reading of Beowulf in Old English. Recommended prerequisite(s): Old English Grammar or instructor permission. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 315 MEDIEVAL CULTURES THROUGH FILM (4)**

An interdisciplinary course exploring the literature, art, philosophy, history, music, and science of the Middle Ages, with films by Pasolini, Bergman, Dreyer, Einstein, Annaud, Vigne, and others, and highlighted by a medieval banquet. Cross-listed with MDST 315. URL: [www.ruf.rice.edu/~jchance/med\\_cult.html](http://www.ruf.rice.edu/~jchance/med_cult.html). Instructor(s): Chance.

**ENGL 316 CHAUCER (3)**

A course on Chaucer and his literary culture and philosophical backgrounds. Readings include minor poems, a dream vision, "The Canterbury Tales", "Troilus and Criseyde". Cross-listed with MDST 316, SWGS 305. URL: [www.ruf.rice.edu/~jchance/chaucer3.html](http://www.ruf.rice.edu/~jchance/chaucer3.html). Instructor(s): Chance.

**ENGL 317 ARTHURIAN LITERATURE (3)**

A survey of the origins and development of the Arthurian legend from the earliest chronicles in the sixth century and later medieval French, Welsh, Irish, and English Arthurian poems to modern adaptations of Arthurian material, including films. Cross-listed with MDST 317. URL: [www.ruf.rice.edu/~jchance/arthurian.pdf](http://www.ruf.rice.edu/~jchance/arthurian.pdf). Instructor(s): Chance.

**ENGL 318 J.R.R. TOLKIEN AND THE MIDDLE AGES (3)**

A course that examines Tolkien's awareness of medieval works such as "Beowulf", "The Battle of Maldon", "The Wanderer", "Old English Riddles", "Sir Gawain and the Green Knight", and the Finnish "Kalevala" in his scholarship and fiction, including "The Hobbit", "The Lord of the Rings", and the "Silmarillion". Cross-listed with MDST 318. Limited enrollment. URL: [www.ruf.rice.edu/~jchance/tol2006.pdf](http://www.ruf.rice.edu/~jchance/tol2006.pdf). Instructor(s): Chance.

**ENGL 320 SHAKESPEARE ON FILM (3)**

A course that examines both the text of selected Shakespearean plays and films based on them, focusing on the difference between film and drama. Instructor permission required. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 321 SHAKESPEARE (3)**

An examination of representative early Shakespearean plays, including tragedies, comedies, and histories. Plays vary from year to year. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 322 LATE SHAKESPEARE (3)**

A performance oriented examination of representative late Shakespearean plays, including tragedies, comedies, histories, and romances. Plays vary from year to year.

**ENGL 323 EARLY MODERN DRAMA (3)**

A course that focuses on selected plays of Elizabethan and Jacobean England, read both for their literary significance and for the way they were part of the period's social, economic, and political forces. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 326 EARLY MODERN LITERATURE: 17TH C. POETRY & PROSE (3)**

A course focusing on various genres of English literature from the early modern period. Topics vary and have recently included "Love, Sex and Death" and "The Culture of Love". URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 328 MILTON (3)**

A course on the major poems and prose of John Milton. Graduate/Undergraduate version: ENGL 528. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 329 SURVEY OF BRITISH WOMEN WRITERS FROM 1400-1900 (3)**

A survey of major British early writers. Poems, memoirs, plays, and novels by significant women, and their film adaptations. Cross-listed with SWGS 349. Instructor(s): Chance.

**ENGL 330 ORIGINS OF THE ENGLISH NOVEL (3)**

A course that focuses on the most important literary innovation of the 18th-century: the birth of the novel. We will examine the modern social and cultural forces crucial to and inextricable from this watershed development: the emergence of liberalism, conservatism, feminism, class, secular culture, the sex/gender system, individualism, and the separation of public and private spheres. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 331 TOPICS IN 18TH CENTURY BRITISH LITERATURE (3)**

A variable topics course that covers the major themes, forms, authors, and genres in 18th-century British literature. Topics may include studies in the early novel tradition; literature's connection to Enlightenment innovations in philosophy, politics, social structure, religion, and gender relations. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 332 LITERATURE OF THE ENGLISH ENLIGHTENMENT (3)**

A course that examines a representative range of British prose and poetry from 1660-1790, the period known as the Enlightenment. This was a volatile age of plots, revolution, philosophical and scientific innovation, and literary transformation. Our readings will cover poems of several genres, short prose narratives, essays and philosophical treatises URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 333 18TH CENTURY BRITISH FICTION (3)**

A course that explores the emergence and consolidation of the English novel and its dynamic relationship to many other 18th-century legacies: the modern individual, capitalism, civil society, the middle class, democracy, and colonialism. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 334 REASON AND FAITH: PHILOSOPHY OF THE ENLIGHTENMENT (3)**

A course that studies the core texts from the European Enlightenment traditions (British, French, and German). Our goal will be to investigate the Enlightenment doctrines concerning the nature of reason and rationality, and the varying engagements—from conciliatory to antagonistic—of the defenders of reason with faith and organized religions. Cross-listed with PHIL 322. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 336 TOPICS IN BRITISH OR IRISH LITERATURE (3)**

A variable topics course focusing on themes, movements, genres across several periods of British literature. Topics might include gothic, nationalism, regional literatures, Irish literature. Repeatable for Credit. URL: [english.rice.edu](http://english.rice.edu).

**ENGL 337 SURVEY OF EARLY 19TH CENTURY BRITISH FICTION (3)**

A course that examines authors and texts that significantly represent the cultural, historical, and literary issues of early 19th-Century Britain. Writers studied might include Edgeworth, Scott, Austen, Bronte, M. Shelley, and others. Limited enrollment.

**ENGL 338 SURVEY OF BRITISH ROMANTICISM (3)**

A multi-genre course on the Romantic period. This course will explore the excesses, extremes, and diversities of British Romanticism across a variety of media: plays, tales, confessions, novels, and satires (including illustrations, paintings, and visual spectacles). URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 339 SURVEY OF BRITISH ROMANTIC POETRY (3)**

A course that focuses on the poets commonly associated with British Romanticism - Blake, Shelley, Coleridge, Wordsworth, Byron, and Keats - while also contextualizing these poets in relation to the sentimental, gothic, and equally impassioned writings of the writers collected in the anthology *British Women Poets of the Romantic Era*. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 341 VICTORIAN LITERATURE AND CULTURE (3)**

A multi-genre course that explores the array of creative works that examines the Victorian period through poetry, non-fiction prose, fiction, art and material culture. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 342 SURVEY OF VICTORIAN FICTION (3)**

A survey of the many genres of the nineteenth-century novel. This course will try to come to terms with some of the insistent questions posed by and through the fiction of the period. Cross-listed with SWGS 372. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 346 20TH CENTURY BRITISH LITERATURE (3)**

A course that surveys the British novel from Kipling to Rushdie, focusing on the highlights of high modernism, the shift in the center of gravity from England itself to the colonies, and the narrative necessities that arise from different cultures and politics. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 348 SURVEY OF BRITISH POETRY: 1500-PRESENT (3)**

A survey of the British poets of 20th-century. The course will focus on modernism and the reactions to it, minority dialects, and postcolonial issues. Poets might include W.B. Yeats, W.H. Auden, Philip Larkin, Ted Hughes, Seamus Heaney, and Derek Walcott. Limited enrollment. URL: [english.rice.edu](http://english.rice.edu).

**ENGL 349 EUROFICTION: CERVANTES TO 1900 (3)**

An examination of the various roots of the European novel in Cervantes, Potocki, and Lafayette, its growth through Romantic writers like Pushkin and Stendahl, and its great finales in Manzoni, Tolstoy, and Flaubert. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 350 SURVEY OF EUROPEAN FICTION: 20TH CENTURY (3)**

A survey of political and formal developments in French, German, Russian, and Eastern European novels by writers such as Proust, Hasek, Pasternak, Hrabal, and Boll. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 355 MODERN SHORT STORY: TOWARDS AN ETHICS OF FICTION (3)**

A study of great works of American and European short fiction of the 19th and 20th centuries, with special attention to the ethical dimensions that this and all fiction articulates. Selected critical essays will complement readings from Melville, Haubert, Mann, Maupassant, Gogol, Wilde, Chekhov, Gilman, Kafka, O'Connor, Carver and Garcia-Marquez. Cross-listed with FREN 355. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 357 ORIGINS OF THE POSTMODERN (3)**

An examination of diverse cultural manifestations of the "postmodern" through the last half of the twentieth century. Popular music, novels, plays, film, art, and fairy-tales may be discussed. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 360 AMERICAN LITERATURE, BEFORE 1860 (3)**

A course that focuses careful attention on complete reading on a number of the most significant traditionally valued texts of the "American Renaissance." URL: [www.english.rice.edu](http://www.english.rice.edu).



**ENGL 361 AMERICAN LITERATURE 1860-1910 (3)**

A survey of the literature of the major authors of the period that might include Mark Twain, Emily Dickinson, Stephen Crane, Henry James, and others. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 362 SURVEY OF AMERICAN FICTION 1910-1950 (3)**

A survey of the fiction of the first half of the 20th century, one of the great periods of social turmoil and intense artistic experimentation. Authors may include Chopin, Hemingway, Fitzgerald, Toomer, Faulkner, Hurston, Barnes. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 363 AMERICAN FICTION 1950-PRESENT (3)**

The course will include an examination of the narrative experiments and trends of the period. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 364 AMERICAN POETRY 1900-1960 (3)**

A survey of representative American poets of the period. These may include Gertrude Stein, Amy Lowell, Robert Frost, Wallace Stevens, William Carlos Williams, Ezra Pound, Marianne Moore, T.S. Eliot. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 365 AMERICAN POETRY 1960-PRESENT (3)**

A survey of contemporary U.S. poetry: Poets studied may include Elizabeth Bishop, Robert Hayden, Randall Jarell, John Berryman, Robert Lowell, Gwendolyn Brooks, Denise Levertov, James Merrill, John Ashbury, Philip Levine, Anne Sexton, and others. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 366 TOPICS IN AMERICAN LITERATURE (3)**

A variable topics course focusing on themes, movements, or genres across several periods of American literature. Topics have included immigration, modernism, and post-nationalism. Cross-listed with SWGS 366. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 368 LITERATURE AND THE ENVIRONMENT (3)**

A course that asks the questions: How does literature express or shape environmental values? In this class, we will read American fiction and nonfiction exploring the relationship between human and nonhuman nature. Cross-listed with ENST 368. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 369 LITERATURE AND CULTURE OF THE AMERICAN WEST (3)**

An examination of the American literary West through the historical context of the U.S. in the 20th century, especially in light of post modernity, the civil rights movement, Hollywood, and global politics. Cross-listed with SWGS 329. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 370 SURVEY OF AFRICAN AMERICAN LITERATURE (3)**

A course that traces, through various genres and themes, African American literary history from the late eighteenth century to the present. Attention is given to theories and critiques of African American literature and culture. Cross-listed with SWGS 370. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 371 SURVEY OF CHICANO/A LITERATURE (3)**

A mixed-genre course focusing on the Chicano movement, the Chicano renaissance, and alternative literary and mythic traditions associated with them. Cross-listed with SWGS 354. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 373 SURVEY OF AMERICAN FILM AND CULTURE (4)**

A course that explores the history of cinema in the U.S. from its origins to the present day. Cross-listed with HART 380. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 376 POSTCOLONIAL STUDIES (3)**

A course that interrogates the history, politics, and/or cultural productions from regions once colonized by European nations. Emphasis may vary from theory and culture to literature and history. Repeatable for Credit. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 377 ART AND LITERATURE (3)**

An exploration of how artworks in various media become meaningful at the level of detail. This work will entail learning how to look, think, and feel at the same time. Key authors and artists may include Vermeer (painting), Hitchcock (film), Hammett (detective fiction). URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 378 LITERATURE OF THE AMERICAS (3)**

A mixed-genre variable topics course that examines literatures in English from North and South America, including the Caribbean. The focus of the course may vary from a survey of a specific geographical region or a group of writers, to a theme that incorporates more than one geographical region or national literature. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 379 INTRODUCTION TO THIRD WORLD LITERATURE (3)**

A course that primarily surveys fiction, poetry, drama, film, (in English) from postcolonial contexts, especially those of Africa, the Caribbean, and the Indian subcontinent. Authors discussed may include Rushdie, Narayan, Roy, Wolcott, Ngugi, Coetzee, and Achebe. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 380 ANGLOPHONE LITERATURES (3)**

A course that focuses on literatures in English that emerge in the wake of European colonialism, except those from the United States. Writers might include those from Africa, Australia, Canada, India, or the Caribbean. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 381 TWENTIETH CENTURY WOMEN WRITERS (3)**

A variable topics course that focuses on women writers from various traditions. Writers might come from Great Britain, the U.S., or elsewhere in translation. Topics have included "sex, gender and modernism", "race and ethnicity" and "African writers of the diaspora". Cross-listed with SWGS 327. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 382 FEMINIST LITERARY THEORY (3)**

An introduction to the core concepts and writings of the field. Cross-listed with SWGS 480. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 385 FILM STUDIES (3 TO 4)**

A variable topics course that may focus on such areas as film genres, national cinemas, world cinema, directors or other thematically organized topics. Cross-listed with HART 383. Repeatable for Credit. URL: <http://english.rice.edu>.

**ENGL 387 CULTURAL STUDIES (3 OR 4)**

A variable topics course that may focus on one or more theorists, on a genre or theme, or on debates within the field of cultural studies. Recent topics have included film, mass culture, Marx, and contemporary ethnic studies. Not limited in period, scope, or geography. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 388 MEDIA STUDIES (3 TO 4)**

A variable topics course that addresses interdisciplinary approaches to studying the relationships between film, photography, television, and digital technologies such as the internet and computer-generated imaging. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 389 GENERATION X IN LITERATURE AND CULTURE (3)**

An interdisciplinary survey of Generation X in literature, music, film, and politics. Cross-listed with SWGS 389. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 390 INTRODUCTION TO THEATRE (3)**

A survey of the art and theory of the theatre through an examination of dramatic literature from the Greeks through the modern era. The course will also explore the craft of the theatre as it is practiced today. Cross-listed with THEA 303. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 392 CONTEMPORARY POETRY (3)**

An in-depth analysis of contemporary poetry and poetics, from a variety of national traditions that raises questions about tradition and innovation, the personal and the political, aesthetics, technique, and experience. Readings will focus on the rich variety of work written in English between the last decades of the twentieth century and the present. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 394 STRUCTURE OF ENGLISH LANGUAGE (3)**

Introduction to modern English grammar, phonology, and semantics. Cross-listed with LING 394. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 396 LITERARY GENRES (3)**

A variable topics course that offers an in-depth look at a particular literary genre or subgenre over a range of historical periods. Topics may include detective fiction, romance, the novel, magical realism, the lyric, or melodrama. Repeatable for Credit.

**ENGL 397 TOPICS IN LITERATURE (3)**

A variable topics course varying from year to year. Recent topics have included "Electronic Literature", "Freaks in U.S. Culture", and "The American Seen Through British Eyes". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 401 ADVANCED CREATIVE WRITING: FICTION (3)**

A course conducted mostly as a workshop. It will also include some assigned writing exercises and weekly reading of published short stories to deepen students' understanding of narrative technique. Prerequisite(s): ENGL 301 or permission of instructor. Repeatable for Credit. URL: [www.ruf.rice.edu/~jcronin/301/indx.html](http://www.ruf.rice.edu/~jcronin/301/indx.html). Instructor(s): Cronin.

**ENGL 402 WRITING LONGER FICTION: NARRATIVE DESIGN (3)**

A course for advanced fiction writers who wish to expand their knowledge of narrative design and work in longer forms. Students will write a proposal for a longer project at the start of the semester and complete no fewer than sixty pages (a novel excerpt, a complete novella, 2-3 linked stories) by the end.

**ENGL 404 ADVANCED CREATIVE WRITING: POETRY (3)**

An in-depth study of contemporary poetry, this course emphasizes the careful analysis of books by six to eight contemporary poets, the reading of selected essays on poetic technique, and the writing of poems with a view toward finding a personal voice. Pre-requisite(s): ENGL 304 or permission of instructor. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 405 ADVANCED CREATIVE WRITING: PERSONAL ESSAY (3)**

An advanced reading and writing workshop for writers who have some familiarity with the nonfiction genre. Published works will be read as blueprints for the construction of student work. Pre-requisite(s): ENGL 305. Repeatable for Credit. Limited enrollment. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 420 16TH CENTURY BRITISH STUDIS (3)**

A variable topics course designed to build on student knowledge of sixteenth-century literature and culture gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

- ENGL 422 18TH CENTURY BRITISH STUDIES (3)**  
A variable topics course designed to build on student knowledge of eighteenth-century literature and/or culture gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 423 19TH CENTURY BRITISH STUDIES (3)**  
A variable topics course designed to build on student knowledge of nineteenth-century literature and/or culture gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 424 20TH CENTURY BRITISH STUDIES (3)**  
A variable topics course designed to build on student knowledge of twentieth-century literature and/or culture gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 441 VICTORIAN STUDIES (3)**  
A variable topics course designed to build on student knowledge of Victorian literature and/or culture gained earlier in the curriculum. Recent topics have included the family, "The Pre-Raphaelites", "Around 1900" and the "Long Victorian Novel". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 443 AUSTEN ONLY (3)**  
An in-depth exploration of Jane Austen as author and icon. Material will include all her fiction as well as portions of her letters and biography. Recent film and television adaptations of her novels will also be critically examined. Cross-listed with SWGS 405. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 461 19TH-CENTURY AMERICAN STUDIES (3)**  
A variable topics course designed to build on student knowledge of twentieth-century literature and/or culture gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 462 20TH-21ST CENTURY AMERICAN LITERATURE AND CULTURE (3)**  
A variable topics course designed to build on student knowledge of twentieth and twenty-first century U.S. literature and/or culture gained earlier in the curriculum. Recent topics have included social justice, and contemporary fiction. Cross-listed with SWGS 462. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 466 STUDIES IN AMERICAN LITERATURE (3)**  
Aspecial topics course in American literature and culture that transcends historical periods. Recent topics have included systems theory, and American modernism and animality. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 470 STUDIES IN AFRICAN AMERICAN LITERATURE (3)**  
A variable topics course designed to build on student knowledge of African American literature gained earlier in the curriculum. Recent topics include black women writers. Cross-listed with SWGS 453. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 471 STUDIES IN CHICANO/A LITERATURE (3)**  
A variable topics course designed to build on student knowledge of chicano/a literature and culture gained earlier in the curriculum. Past topics have included the Chicano/a novel, and Transitions and Translations Chicano/a Autobiography. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 472 NATIVE AMERICAN LITERATURE (3)**  
An examination of the literature of the Native American Renaissance, from N. Scott Momaday's groundbreaking Pulitzer Prize-winning novel, *House Made of Dawn* (1968), to the recent works of some emerging writers. Although our focus will be on the contemporary novel, we will also explore American Indian autobiography and other works of nonfiction. Our literary analysis will be supplemented by an awareness of the cultural and political movements important to American Indian peoples in the late 20th century. To what extent are Native texts both innovative forms of artistic expression within a literary tradition and instruments of social change? How might Native American works be read as "resistance" literature? In exploring such questions, the class will address the issues of sovereignty, land claims, activism, and identity. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 475 MODERN DRAMA ON FILM AND IN PERFORMANCE (3)**  
A course that focuses on drama not only as a text but also as performance. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Huston.
- ENGL 481 STUDIES IN FEMINIST LITERARY THEORY (3)**  
A variable topics course designed to build on student knowledge of modern literature gained earlier in the curriculum. Cross-listed with SWGS 407. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 485 STUDIES IN MODERN LITERATURE (3)**  
A variable topics course designed to build on student knowledge of modern literature gained earlier in the curriculum. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 487 GLOBAL FICTIONS (3)**  
An examination of narrative fictions that represent various attempts to grasp the global--as an idea, a cognitive map, a pattern of movement, a series of events, a montage of images, etc. URL: [www.english.rice.edu](http://www.english.rice.edu).
- ENGL 488 MEDIA STUDIES (4)**  
A variable topics course designed to build on student knowledge of media studies gained earlier in the curriculum. Repeatable for Credit. URL: <http://www.english.rice.edu>.

**ENGL 489 STUDIES IN FILM (3 OR 4)**

A variable topics course designed to build on student knowledge of film studies gained earlier in the curriculum. Cross-listed with HART 486. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 490 STUDIES IN MAJOR BRITISH AUTHORS (3)**

A variable topics course, which offers the opportunity for in-depth investigation of one or more major British authors, not possible in the broader survey formats. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 491 STUDIES IN MAJOR AMERICAN AUTHORS (3)**

A variable topics course, which offers the opportunity for in-depth investigation of one or more major American authors not possible in the broader survey formats. Recent authors have included James, Wharton, Poe, and Hawthorne. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 493 DIRECTED READING (1 TO 6)**

A variable-credit course designed for students who want to pursue intensive semester-long study of a particular topic not included in the curriculum. Students must identify and receive the approval of an English department faculty member. Once a professor and student agree to work together, they must devise a syllabus for the course, which must be approved by the department chair. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 495 SENIOR THESIS (3)**

An opportunity for advanced English majors to pursue a substantive research project in conjunction with a faculty advisor. Permission of faculty members required prior to enrollment. Department permission required. Repeatable for Credit. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 498 QUEER THEORY (3)**

An examination of key issues in queer theory that links those issues to other major literary and cultural theories of the past quarter century. As such, the course will also serve as an introduction to psychoanalytic theory, post-culturalism, deconstruction, postcolonial theory, film studies and recent work on the relationship between science and literature. Cross-listed with SWGS 430. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 499 LITERARY THEORY (3)**

Designed for undergraduates who have taken ENGL 300 or its equivalent and for graduate students who want to reinforce their theoretical knowledge. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 509 MASTER'S THESIS (3)**

URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 510 PEDAGOGY (2)**

For third-year students preparing to teach their own classes in the fourth year. This two-semester course will help students put together syllabi and other teaching materials, address various pedagogical issues and problems, formulate their teaching philosophies and provide classroom assistance in their independent teaching. Offered Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 511 PEDAGOGY (1)**

Continuation of ENGL 510. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 514 MIDDLE ENGLISH LITERATURE AND SUBJECTIVITY (3)**

A survey of middle English lyrics, romances, dream visions, debate poems, mystery and morality plays, and other philosophical and biographical treatises from 1250-1500. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Chance.

**ENGL 516 CHAUCER AND THE SUBVERSIVE OTHER (3)**

An exploration of exemplary treatments of alterity and difference in Chaucer. See course webpage for additional information. URL: [ruf.rice.edu/~jchance/ch.htm](http://ruf.rice.edu/~jchance/ch.htm). Instructor(s): Chance.

**ENGL 517 MEDIEVAL WOMEN WRITERS (3)**

An examination of the most significant medieval European women authors from the tenth through the seventeenth centuries, from the Byzantine Empire to France, Germany, Italy, England, Austria, Belgium, Bohemia, and Spain. See course web page for additional information. Cross-listed with SWGS 517. URL: [www.ruf.rice.edu/~jchance/medwoman.html](http://www.ruf.rice.edu/~jchance/medwoman.html). Instructor(s): Chance.

**ENGL 518 MEDIEVAL STUDIES (3)**

A special topics course in medieval European comparative literature. Past topics have included "The Medieval Dream Vision and Visionary Work". Repeatable for Credit. Instructor(s): Chance.

**ENGL 519 16TH CENTURY BRITISH LITERATURE (3)**

A variable topics course. Past topics have included Personal Voice: Renaissance Lyric and Autobiography, Renaissance Genders and Renaissance Sexualities; and Spenser. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 520 SHAKESPEARE AND DIFFERENCE (3)**

Please consult the English department website for additional information. Cross-listed with SWGS 520. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 521 SHAKESPEARE (3)**

A variable topics course. Please consult the English department website for additional information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 522 SHAKESPEARE AND THEORY (3)**

A variable topics course. Please consult the English department website for additional information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 523 EARLY MODERN DRAMA (3)**

A variable topics course. Please consult the English department website for additional information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 526 17TH CENTURY POETRY AND PROSE (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics include Revolution, Apocalypse and the Self. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 528 MILTON (3)**

Graduate/Undergraduate version: ENGL 328. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 532 18TH CENTURY BRITISH STUDIES (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics include Enlightenment Institutions, Origins of British Novel, Eighteenth-century Emergences, and Libertinism. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 534 18TH CENTURY BRITISH FICTION (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics include History of "The Novel, Part I" and "Origins and Displacements". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 537 EARLY 19TH CENTURY STUDIES (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included "The Serialization of the Novel". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 539 BRITISH ROMANTICS (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included Gothic Romanticism. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 541 VICTORIAN STUDIES (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included "Material Constructions, or What Things Have to Do With Us", and "On or About 1860". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 542 VICTORIAN FICTION (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included "The Victorian Marriage Plot", "The History of the Novel, Part II"; and "Victorian and Modern Sexualities". Cross-listed with SWGS 542. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 543 VICTORIAN POETRY AND PROSE (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included "The Long Victorian Poem". Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 546 20TH CENTURY BRITISH LITERATURE (3)**

A variable topics course. Please consult the English department website for additional course information. Cross-listed with SWGS 546. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 560 19TH CENTURY AMERICAN LITERATURE (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Dickinson and Crane; Hawthorne and Stowe; Male Subjectivities; Howells and Wharton; 19th-century Women Writers; Slavery and the Sentiment Novel; Liberalism; and Agency, Class and Anxiety in 19th-century American Literature and Criticism. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 562 MODERN AMERICAN FICTION (3)**

A variable topics course. Please consult the English department website for additional course information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 563 20TH CENTURY AMERICAN LITERATURE AND CULTURAL STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included U.S. Race and Ethnicity; (Trans) Formations of Race and Nation; Edith Wharton the Uses of Literature; and Late 20th-century American Literature and Culture. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 564 FAULKNER AND CONTEMPORARY THEORY (3)**

An intensive examination of four or five of Faulkner's major novels in the context of a broad range of twentieth-century interpretive strategies. The class will consider issues of narrative form, social context, gender, race, and modern and postmodern aesthetics. Consult the English department website for additional information. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 570 AFRICAN AMERICAN STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 572 CHICANO/A STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Narrative Theory and Chicano/a Ethnography. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 575 FILM AND THEORY (3)**

A variable topics course. Please consult the English department website for additional information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 580 GENRE STUDIES (3)**

An in-depth look at a particular literary genre or subgenre over a range of historical periods. Examples might include romance, the novel, the lyric, or melodrama. Recent topics have included The Romance. Repeatable for Credit. URL: [english.rice.edu](http://english.rice.edu).

**ENGL 581 CULTURAL STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Contemporary Issues in U.S. Culture and Studies in Sexuality: Thinking Sex Under Neo-Liberalism. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 582 FEMINIST LITERARY THEORY (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Sexualities. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 585 POSTCOLONIALISM AND AFTER (3)**

A course that serves both as an introduction to postcolonial theory and as a reevaluation of its political and ethical ends vis-à-vis recent debates around globalization and cosmopolitanism. For additional course information, please consult the English department website. Cross-listed with SWGS 585. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 588 MEDIA STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Representing Reality: Cinema, Television and Digital Technologies and The Body in Visual Culture. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 589 FILM STUDIES (3)**

A variable topics course. Please consult the English department website for additional course information. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 591 STUDIES IN LITERATURE AND OTHER DISCIPLINES (3)**

A variable topics course. Please consult the English department website for additional information. Recent topics have included Visual Cultures 1550-1800 and Problems of Close Reading in Literature and Film. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 592 STUDIES IN MODERNISM (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included What Was Modernism; and Joyce and Modernism. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 594 STUDIES IN CONTEMPORARY LITERATURE AND CULTURE (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Global English; Globalization and its Discontents; and Critical Regionalisms. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 596 STUDIES IN MAJOR AMERICAN AUTHORS (3)**

A variable topics course. Please consult the English department website for additional course information. Recent topics have included Emerson and Post-humanism. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 597 ANGLOPHONE FICTION (3)**

A variable topics course. Please consult the English dept website for additional course information. Recent topics have included Narrative and Cultural Differences. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 599 STUDIES IN LITERARY THEORY (3)**

A variable topics course. Please consult the English dept website for additional course information. Recent topics have included Pragmatism and Postmodernity; Systems Theory; Post-Structuralism and Postmodernity; and Where We've Been: Reflecting on the Academy. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 600 PROFESSIONAL METHODOLOGY (3)**

A required course for first-year graduate students that identifies and explores important issues and debates in recent literary and cultural theory. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 601 FALL TEACHING PRACTICUM (3)**

Open only to those graduate students serving as teaching assistants for courses in English or the humanities. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 602 SPRING TEACHING PRACTICUM (3)**

Open only to those graduate students serving as teaching assistants for courses in English or the humanities. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 603 FALL TEACHING OF LITERATURE AND COMPOSITION (3)**

Open only to graduate students teaching courses in the fall semester. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 604 SPRING TEACHING OF LITERATURE AND COMPOSITION (3)**

Open only to those graduate students teaching courses in the spring semester. Offered Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 605 THIRD-YEAR WRITING WORKSHOP (3)**

A workshop required of third-year students designed to help transform seminar papers into works of publishable quality. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 621 FALL DIRECTED READING (3)**

A course designed for students who want to pursue intensive semester-long study of a particular topic not included in the curriculum. Students must identify and receive the approval of an English department faculty member. Once a professor and student agree to work together, they must devise a syllabus for the course, which must be approved by the department chair. Repeatable for Credit. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 622 SPRING DIRECTED READING (3)**

A course designed for students who want to pursue intensive semester-long study of a particular topic not included in the curriculum. Students must identify and receive the approval of an English department faculty member. Once a professor and student agree to work together, they must devise a syllabus for the course, which must be approved by the department. Repeatable for Credit. Offered Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 703 FALL RESEARCH LEADING TO CANDIDACY (1 TO 9)**

Repeatable for Credit. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 704 SPRING RESEARCH LEADING TO CANDIDACY (1 TO 15)**

Repeatable for Credit. Offered Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENGL 800 PHD RESEARCH AND THESIS (1 TO 9)**

To be taken after a student has been admitted to candidacy. Repeatable for Credit. Offered Fall & Spring. URL: [www.english.rice.edu](http://www.english.rice.edu).

**ENST (ENVIRONMENT STUDIES)****School of Natural Sciences/Environment Studies****ENST 101 THE SUSTAINABLE ENVIRONMENT: THE LITERATURE OF PLACE (3)**

This course is intended as an introduction to environmental studies and will have a humanistic focus this semester on "The Literature of Place," primarily nonfiction prose and personal essays which describe the writer's connection with a particular place and the accompanying interaction of humans and the natural environment in that place and more generally. Must be in one of the following Classification(s): Freshman, Junior, Sophomore, Senior. Limited enrollment. Not offered this academic year.

**ENST 102 EVOLUTION OF THE EARTH (3)**

History of the Earth. Earth's systems over the past 4.6 billion years. Topics include evolution of life, continents, ocean basins and climate. Cross-listed with ESCI 102. Offered Spring. Instructor(s): Dugan; Masiello.

**ENST 113 ENVIRONMENTAL CRISIS SEMINAR (1)**

Seminar topics may vary. Cross-listed with ESCI 113. Offered Fall. Instructor(s): Dickens; Dugan; Masiello.

**ENST 114 NATURAL DISASTER SEMINAR (1)**

Hurricanes have devastated the United States over the last two hurricane seasons. We will investigate the science behind hurricanes and the impacts of hurricanes on humans. We will learn what controls hurricanes and uncertainty in prediction. We also will look at historical and modern human reactions and responses to major events. Cross-listed with ESCI 114. Offered Spring.

**ENST 281 ENGINEERING SOLUTIONS FOR SUSTAINABLE COMMUNITIES (3)**

Students will work in teams to develop sustainable solutions for energy or environmental problems affecting our Houston and Rice communities. Emphasis will be placed on the integration of engineering fundamentals with societal issues, environmental and safety considerations, sustainability and professional communications. Prerequisites: introductory engineering courses or permission of instructor. Cross-listed with CHBE 281. Instructor permission required. Limited enrollment. URL: [www.ruf.rice.edu/~che/undergraduate/CHBE\\_281](http://www.ruf.rice.edu/~che/undergraduate/CHBE_281). Instructor(s): Zygourakis; Kyriacos; Johnson; Richard.

**ENST 301 INTRODUCTION TO THE ENVIRONMENT: ENVIRONMENTAL HISTORY AND ENVIRONMENTAL LITERATURE (3)**

This course is intended as an introduction to environmental studies from all divisions of the campus. The course focuses on attitudes and values relating to the environment as represented in environmental history and environmental literature. Limited enrollment. Offered Fall & Spring.

**ENST 302 ENVIRONMENTAL ISSUES: RICE INTO THE FUTURE (3)**

This course addresses science, technology, and policy elements of environmental issues. Students use the campus and local community as a laboratory in which to do projects to reduce environmental impacts, enhance sustainability, or resolve environmental problems. Limited enrollment. Offered Spring. Instructor(s): Johnson.

**ENST 307 ENERGY AND THE ENVIRONMENT (3)**

This course explores the physical principles of energy use and its impacts on Earth's environment and climate. Topics will include energy mechanics, climate change, and the environmental impacts and future prospects of various fossil fuel and alternative energy sources. Offered Spring. Instructor(s): Cohan.

**ENST 312 ENVIRONMENTAL BATTLES IN THE 21ST CENTURY: HOUSTON AS MICROCOSM (3)**

This course will examine Houston (and neighboring areas) as a vivid case study in a broad array of environmental issues that engage policymakers, business leaders, scientists and other researchers, environmentalists, and citizens, not just in Houston but also across the United States and in other nations. There will be a particularly strong focus on air pollution, given Houston's well-known air quality problems and the especially complicated challenges they present. As with other topics covered in the course, air quality will be addressed in a multi-faceted manner, with discussion of its scientific, political, economic, sociological and historical dimensions. Offered Spring. Instructor(s): Dawson.

**ENST 313 SUSTAINABLE DESIGN (3)**

This course will explore sustainable design from initial sustainable facility concepts and team organizations, to enlisting community support and process assessment. The course will develop into details about sustainable design, lessons learned, processes and outcomes. Cross-listed with ARCH 313. Limited enrollment. Offered Fall. Instructor(s): Taylor.

**ENST 314 ENVIRONMENTAL HEALTH (3)**

This course will provide an overview of environmental health issues including an introduction to key epidemiological methods used to study environmental health. The course includes guest lectures from area medical schools and critical reading of studies addressing key environmental health issues. Prerequisite(s): BIOS 201 and BIOS 202 or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Hamilton.

**ENST 323 CONSERVATION BIOLOGY (3)**

The course is designed to give students a broad overview of conservation biology. Lecture and discussions will focus on conservation issues such as biodiversity, extinction, management, sustained yield, invasive species and preserve design. Cross-linked with BIOS 323. Cross-listed with BIOS 323. Instructor permission required. URL: [www.owlnet.rice.edu/~bios323](http://www.owlnet.rice.edu/~bios323). Instructor(s): Siemann.

**ENST 331 ENVIRONMENTAL POLITICS AND POLICY (3)**

The course considers the major issues in the increasingly important public policy area of the environment. It emphasizes the American experience, but also considers certain international aspects of these issues. Limited enrollment. Instructor(s): Mortensen

**ENST 340 GLOBAL BIOGEOCHEMICAL CYCLES (3)**

This course introduces students to the coupled nature of the biosphere, atmosphere and hydrosphere using as focal points elemental cycles such as those of carbon and nitrogen. Cross-listed with BIOS 340, ESCI 340. Limited enrollment. Offered Fall. Instructor(s): Masiello.

**ENST 350 ENVIRONMENTAL INTERNSHIP (1 TO 6)**

Provides enrollment credit for approved internships with environmental organizations or agencies. Students must seek approval prior to beginning the internship. Weekly progress reports and a final paper are required. Instructor permission required. Offered Fall & Spring.

**ENST 367 ENVIRONMENTAL SOCIOLOGY (3)**

Applications of research and theory in the social sciences to an understanding of the attitudes and behaviors that contribute both to environmental problems and to their remediation; examination of the interactions between population pressures and human appetites, technological developments and ecological constraints as they combine to shape the human prospect. Cross-listed with SOCI 367. Limited enrollment. Offered Fall. Instructor(s): Klineberg.

**ENST 368 LITERATURE AND THE ENVIRONMENT (3)**

How does literature express or shape environmental values? In this class, we will read American fiction and nonfiction exploring the relationship between human and nonhuman nature. Cross-listed with ENGL 368. Limited enrollment. Instructor(s): Slappey.

**ENST 400 INDEPENDENT STUDY (3 TO 9)**

Instructor permission required. Offered Fall & Spring.

**ENST 401 COMMON PROPERTY RESOURCES (3)**

Common Property Resources (CPRs), such as fisheries, aquifers, and the internet, appear in many guises and pose a fundamental problem for governing. Exploration of theoretical underpinnings of CPRs, their growing literature, and the political and economic institutions mediating CPR dilemmas. Included is an original research project in conjunction with the instructor. Limited enrollment. Instructor(s): Wilson.



**ENST 406 INTRODUCTION TO ENVIRONMENTAL LAW (3)**

Legal techniques by societies to plan and regulate the use of environmental resources. Cross-listed with CEVE 406. Instructor(s): Blackburn.

**ENST 425 ORGANIC GEOCHEMISTRY (3)**

This course covers the organic geochemistry of the natural environment. Topics include: production, transport, decomposition, and storage of organic matter in the marine and terrestrial environments, use of isotopes to track biogeochemical processes and natural and perturbed carbon cycle issues, including past and recent climate shifts. Cross-listed with CHEM 425, ESCI 425. Offered alternate years. Instructor(s): Masiello.

**ENST 437 ENERGY ECONOMICS (3)**

Discussion of key aspects in the supply and demand of energy. Topics include optimal extraction of depletable resources, transportation, storage, end-use and efficiency, and the relationship between economic activity, energy, and the environment. Cross-listed with ECON 437.

**ENST 441 COMMON PROPERTY RESOURCES (3)**

Common Property Resources (CPRs), such as fisheries, aquifers, and the Internet, appear in many guises and pose a fundamental problem for governing. Exploration of theoretical underpinnings for CPRs, their growing literature, and the political and economic institutions mediating CPR dilemmas. Included is an original research project in conjunction with the instructor. Cross-listed with POLI 441. Limited enrollment. Instructor(s): Wilson.

**ENST 480 ENVIRONMENTAL AND ENERGY ECONOMICS (3)**

The economic theories of externalities and common property resources are used to analyze environmental problems. Regulation, taxes and subsidies, transferable pollution rights and legal solutions to environmental problems are evaluated. Environmental and other aspects of alternative energy sources are considered and the pricing of depletable energy resources is analyzed. Cross-listed with ECON 480. Instructor(s): Mieszkowski.

**ENST 490 SPECIAL STUDY & RESEARCH (1 TO 12)**

Open to environmental science or engineering majors with permission of instructor. Written report required. Cross-listed with CEVE 490. Instructor permission required.

**ESCI (EARTH SCIENCE)****School of Natural Sciences/Earth Science****ESCI 101 THE EARTH (3)**

Study of the nature of the Earth and its processes. Recommended co-requisite(s): ESCI 105. Offered Fall & Spring. Instructor(s): Lenard; Gordon; Morgan; Luttge.

**ESCI 102 EVOLUTION OF THE EARTH (3)**

Study of Earth's systems over the past 4.6 billion years. Topics include evolution of life, continents, ocean basins and climate. Cross-listed with ENST 102. Recommended co-requisite(s): ESCI 105. Offered Spring. Instructor(s): Dugan; Masiello.

**ESCI 103 FIELD TRIPS FOR THE EARTH (1)**

Three evening lectures of two hours each; one weekend long field trip. Limited enrollment. Offered Fall & Spring. Instructor(s): Droxler.

**ESCI 105 INTRODUCTORY LABORATORY FOR EARTH SCIENCE (1)**

Exercises on rocks, minerals, stratigraphy, paleontology, mapping and plate tectonics. This lab is recommended before taking advanced courses in Earth science. Normally taken with ESCI 101, 102, or 108. Recommended co-requisite(s): ESCI 101, 102, 107, 108, 109, 113 or 114. Offered Fall & Spring. Instructor(s): Zelt.

**ESCI 107 OCEANS AND GLOBAL CHANGE (3)**

Overview of the impact of the ocean and ocean evolution on the Earth's climate. Includes geological, physical, chemical, and biological aspects of change. Limited enrollment. Offered Fall. Instructor(s): Droxler.

**ESCI 108 CRISES OF THE EARTH (3)**

Geological and environmental crises have affected Earth throughout history. Included are meteorite impacts, global extinctions, volcanic eruptions, earthquakes, tsunamis, effect of humans on environment, as well as an overview of historical perspectives, scientific background, and development of these processes, the development of predictive scenarios, and society's adaptations to such hazards. Offered Summer. Instructor(s): Sawyer.

**ESCI 109 OCEANOGRAPHY (3)**

Introduction to the oceans, with an emphasis on how the physics, chemistry, geology, and biology of the oceans are linked. Offered Spring. Instructor(s): Dickens.

**ESCI 110 ENERGY, THE ENVIRONMENT, AND SOCIETY (3)**

Undergraduate seminar on current issues in energy used by industrial society, energy resources and their impact on the environment. Offered on demand. Instructor(s): Levander.

**ESCI 113 ENVIRONMENTAL CRISIS SEMINAR (1)**

Discussion of environmental crises. Topics vary annually. Cross-listed with ENST 113. Offered Fall. Instructor(s): Dugan.

**ESCI 114 NATURAL DISASTER SEMINAR (1)**

Discussion of natural disasters. Topics vary annually. Cross-listed with ENST 114. Offered Spring. Instructor(s): Dugan.

**ESCI 203 INTRODUCTION TO BIOGEOCHEMISTRY (3)**

The interaction between (micro) organisms, minerals, rocks, and aqueous solutions is an important new field of research that requires an interdisciplinary approach between (micro) biology, organic chemistry, and geochemistry. The course provides an introduction and insight into this exciting new field and puts an emphasis on quantitative strategies. Offered on demand or every other Spring. Instructor(s): Luttge.

**ESCI 214 THE PLANETS (3)**

The physical, chemical, and geological development of the solar system from 4.6 billion years ago until today. All planets, their major satellites, comets, and asteroids will be discussed. Limited enrollment. Offered Spring. Instructor(s): McGovern.

**ESCI 307 ENERGY AND THE ENVIRONMENT (3)**

This course explores the physical principles of energy use and its impact on Earth's environment and climate. Topics will include energy mechanics, climate change, and the environmental impacts and future prospects of various fossil fuel and alternative energy sources. Offered Spring. Instructor(s): Cohan.

**ESCI 321 EARTH SYSTEM EVOLUTION AND CYCLES (4)**

This course introduces the systems and processes that shape Earth's surface including weathering, sediment transport, ocean and atmosphere circulation, accumulation of sedimentary material and organisms, including man. A particular emphasis is placed on how biogeochemical cycles and key interactions link and change systems and processes over space and time. Recommended prerequisite(s): MATH 101, 102, PHYS 101 or 111, CHEM 121 or 151. Offered Fall. Instructor(s): Anderson; Dickens.

**ESCI 322 EARTH CHEMISTRY AND MATERIALS (4)**

This course introduces rock-forming processes related to the chemical and physical differentiation of the solid Earth into its main reservoirs: continental crust, oceanic crust, mantle, and core. Beginning with the bulk Earth and an overview of the chemical and petrologic properties of the rocks that make up each of these reservoirs. The basic principles of igneous, metamorphic and sedimentary petrology will be presented in the context of the rock cycle, plate tectonics, as well as the origin of economically and societally important ore deposits. A laboratory and field trip, where students will see petrologic principles applied, will be required. Recommended prerequisite(s): MATH 101 and 102, CHEM 121 or 151. Offered Spring. Instructor(s): Lee.

**ESCI 323 EARTH STRUCTURE AND DEFORMATION (4)**

Introduction to the mechanics and deformation of the Earth's crust and lithosphere, emphasizing rock strength and rheology, earthquakes and faulting, brittle, and ductile deformation mechanisms and processes, and an introduction to tectonic systems. Lab will develop skills for recognition, interpretation, and analysis of deformation structures and processes on maps, cross-sections and seismograms. Course equivalency: ESCI 333. Pre-requisite(s): MATH 101 and MATH 102 and (PHYS 101 or PHYS 111). Offered Fall. Instructor(s): Morgan; Gordon.

**ESCI 324 EARTH'S INTERIOR (4)**

Formation of Earth and solar system, Earth differentiation and geochronology. Structural seismology and the composition of Earth's interior. Density, Earth's gravity, and the geoid. Heat flow and Earth energetics. Earth's core and magnetic field. Mantle convection and plate tectonics. Oceanic and continental crust. Pre-requisite(s): MATH 101 and MATH 102 and (PHYS 101 or PHYS 111) and (PHYS 102 or PHYS 112). Offered Spring. Instructor(s): Niu; Sawyer.

**ESCI 333 EARTH STRUCTURE AND DEFORMATION WITHOUT LAB (3)**

Same as ESCI 323 without a lab. Course equivalency: ESCI 323. May not be enrolled in any of the following Major(s): Earth Science. Pre-requisite(s): MATH 101 and (PHYS 101 or PHYS 111). Offered Fall. Instructor(s): Morgan; Gordon.

**ESCI 334 GEOLOGICAL AND GEOPHYSICAL TECHNIQUES (3)**

An introduction to basic methods of description, recording, and interpretation of geologic and geophysical features in the field, including rock and outcrop description, map and cross-section construction, and data acquisition and analysis. A required seven day field excursion will take place during Spring Break. Recommended prerequisite(s): ESCI 322 and 323. Offered Spring. Instructor(s): Morgan; Lee.

**ESCI 340 GLOBAL BIOGEOCHEMICAL CYCLES (3)**

This course introduces students to the coupled nature of the biosphere, atmosphere and hydrosphere using as focal points elemental cycles such as those of carbon and nitrogen. Cross-listed with BIOS 340, ENST 340. Limited enrollment. Offered Fall. Instructor(s): Masiello.

**ESCI 390 GEOLOGY FIELD CAMP (4 TO 6)**

Field course typically involving geologic mapping in one or more of sedimentary, metamorphic, igneous rocks and structures. Not offered by Rice University. Students must take an approved field camp from another university and transfer credit to Rice University. Pre-requisite(s): ESCI 334.

- ESCI 391 EARTH SCIENCE FIELD EXPERIENCE (4 TO 6)**  
Comprises participating in an earth science expedition or research experience, follow-up analysis of some aspect of the data acquired, and a written report. Must be approved in advance by one of the department undergraduate advisors.
- ESCI 403 SEMINAR: DEPARTMENT RESEARCH (1)**  
Seminar: Introduction to current research in Earth science. Each member of the department participates by describing his or her research and some of the techniques involved. Repeatable for Credit. Offered Fall.
- ESCI 404 SEMINAR: DEPARTMENT RESEARCH (1)**  
Seminar: Introduction to current research in Earth science. Each member of the department participates by describing his or her research and some of the techniques involved. Repeatable for Credit. Offered Spring.
- ESCI 405 SEMINAR: CURRENT RESEARCH IN EARTH SCIENCE (1)**  
A series of lectures on current research in various areas of Earth science. Repeatable for Credit. Offered Fall.
- ESCI 406 SEMINAR: CURRENT RESEARCH IN EARTH SCIENCE (1)**  
A series of lectures on current research in various areas of Earth science. Repeatable for Credit. Offered Spring.
- ESCI 412 ADVANCED PETROLOGY (3)**  
Evaluation of the evolution of igneous rocks in the Earth's crust and mantle. Topics will include phase equilibria, experimental studies, and geochemistry. Labs will stress thin section petrography. Prerequisite(s): ESCI 322. Repeatable for Credit. Offered Spring. Instructor(s): Lee.
- ESCI 415 ECONOMIC GEOLOGY-PETROLEUM (3)**  
A study of the geology of petroleum: origin, migration, and accumulation will be studied. Government regulation and industry economics will be examined. Offered Fall. Instructor(s): Riese.
- ESCI 416 ECONOMIC GEOLOGY MINERAL DEPOSITS (3)**  
An overview of metallic and nonmetallic mineral deposits, theories of their origin, and classification. The impact of government regulation, economics, production practices, and exploration will be considered. Offered Spring. Instructor(s): Riese.
- ESCI 417 PETROLEUM INDUSTRY ECONOMICS AND MANAGEMENT (3)**  
Topics covered include resource size determination; geologic risk analysis; establishing minimum economic thresholds; economic chance factors; the concepts of present worth, investment efficiency, rates of return. Price forecasting, cost inflation are discussed. Recommended prerequisite(s): ESCI 415. Offered Spring. Instructor(s): Riese.
- ESCI 418 QUANTITATIVE HYDROGEOLOGY (3)**  
Advanced course that will provide a quantitative overview of groundwater hydrology. Emphasis will be placed on mastering concepts in fluid mechanics and applying these concepts to water supply, environmental, and geological problems. Cross-listed with CEVE 418. Offered Fall. Instructor(s): Dugan.
- ESCI 420 MODERN EXPLORATION TECHNOLOGY (3)**  
Modern petroleum exploration techniques using geology, geophysics, and information technology methods. As new techniques emerge, the course will change to insure that the course material mirrors the exploration industry. Pre-requisite(s): ESCI 442. Corequisite(s): ESCI 444. Offered Spring. Instructor(s): Danbom.
- ESCI 421 PALEOCEANOGRAPHY (3)**  
The evolution of the ocean, climate and the global carbon cycle over the last 100 million years as recorded by the biology, chemistry and composition of deep-sea sediment. Pre-requisite(s): ESCI 321. Recommended prerequisite(s): ESCI 109. Offered alternate years. Instructor(s): Dickens; Droxler.
- ESCI 423 ANTARCTIC MARINE GEOLOGY (3)**  
The study of marine geologic principles and processes using examples from the Southern Oceans. Recommended prerequisite(s): ESCI 321, and ESCI 323. Instructor(s): Anderson.
- ESCI 424 EARTH SCIENCE AND THE ENVIRONMENT (3)**  
Interrelations between humans and the geologic environment. This course explores theories and problems of chemical hazards in the environment; topics, e.g., groundwater pollution, soils, CO<sub>2</sub> - sequestration, waste deposits. Instructor(s): Luttge.
- ESCI 425 ORGANIC GEOCHEMISTRY (3)**  
This course covers the organic geochemistry of the natural environment. Topics include: production, transport, decomposition, and storage of organic matter in the marine and terrestrial environments, use of isotopes to track biogeochemical processes and natural and perturbed carbon cycle issues, including past and recent climate shifts. Cross-listed with CHEM 425, ENST 425. Offered alternate years. Instructor(s): Masiello.
- ESCI 427 SEQUENCE STRATIGRAPHY (3)**  
This course will introduce students to the concepts of sequence stratigraphy and the power behind this correlation technique. The course is divided between clastic sequence stratigraphy using cores, well-logs, and outcrop examples and seismic sequence stratigraphy. Instructor(s): Abreu.

**ESCI 428      GEOLOGIC INTERPRETATION OF REFLECTION SEISMIC DATA (4)**

Practical application of the reflection seismic method used in the tectonic analysis of deformed belts and sedimentary basins. The course material includes case studies from around the world, with emphasis on the integration of seismic reflection data with other surface and subsurface geological/geophysical information in a regional context. Instructor(s): Tari.

**ESCI 430      TRACE-ELEMENT AND ISOTOPE GEOCHEMISTRY FOR EARTH AND ENVIRONMENTAL SCIENCE (4)**

Introduction to the principles of trace-element and isotope geochemistry and their applications to high and low temperature processes in the earth. Topics to be covered are trace-element partitioning, basic quantum physics, radiogenic isotopic systems and stable isotope fractionation. Recommended prerequisite(s): ESCI 322. Offered Fall. Instructor(s): Lee.

**ESCI 432      MARINE GEOLOGY SYSTEMS (3)**

This course examines areas of the seafloor recently targeted by large-scale science projects, such as the ocean drilling program. The purpose is to understand current ocean geoscience problems, the research being conducted to address these problems, and preliminary results. Offered alternate years. Instructor(s): Dickens.

**ESCI 440      GEOPHYSICAL DATA ANALYSIS: DIGITAL SIGNAL PROCESSING (3)**

Data sampling, aliasing, discrete Fourier transform, digital filter design techniques, z-transform, and discrete Hilbert transform are introduced. Deconvolution, velocity filters, polarization filter, stacking, beam forming and migration techniques will be taught together with their application in geophysical studies. Pre-requisite(s): MATH 101 and MATH 102. URL: [terra.rice.edu/departments/faculty/niu/ESCI440](http://terra.rice.edu/departments/faculty/niu/ESCI440). Instructor(s): Niu.

**ESCI 441      GEOPHYSICAL DATA ANALYSIS: INVERSE THEORY (3)**

Review of linear algebra and probability. Data fitting, model parameter estimation, inverse theory, linear and nonlinear methods, and global optimization. Pre-requisite(s): MATH 211. Offered Spring. Instructor(s): Zelt.

**ESCI 442      EXPLORATION GEOPHYSICS I (4)**

Study of the principles and procedures involved in geophysical exploration. Includes acquisition, processing, and interpretation of seismic ground-penetrating radar, gravity, magnetic, and electrical data. Pre-requisite(s): MATH 101 and MATH 102 and (PHYS 101 or PHYS 111) and (PHYS 102 or PHYS 112). Offered Fall. Instructor(s): Zelt.

**ESCI 444      EXPLORATION GEOPHYSICS II (3)**

Experience with processing reflection seismic data. Includes seismic data organization, velocity analysis, stacking, filtering, deconvolution, migration, and display, using the Center for Computational Geophysics facility's ProMax seismic processing system. Pre-requisite(s): ESCI 442. Offered Spring. Instructor(s): Danbom.

**ESCI 450      REMOTE SENSING (3)**

Introduction to electromagnetic remote sensing of the earth and other planets using passive and active methods. The course includes a computer lab component involving processing and interpretation of remote sensing imagery, and an individual project. Cross-listed with CEVE 450. Offered Spring. Instructor(s): Sawyer.

**ESCI 451      ANALYSIS OF ENVIRONMENTAL DATA (3)**

Introduction to data display, statistical methods, system simulation, and geostatistics for environmental scientists. The course will emphasize the application of these techniques to real and simulated environmental problems. The lab will involve extensive computer use and the completion of a major individual project on a topic selected by the student. Cross-listed with CEVE 451. Offered Fall. Instructor(s): Jones.

**ESCI 454      GEOGRAPHIC INFORMATION SCIENCE (3)**

Introduction to geographic information systems (GIS) technology, mapping sciences, and spatial analysis. The course will include extensive computer use and the completion of a major individual project on a topic selected by the student. Cross-listed with CEVE 453. Offered Fall. Instructor(s): Sawyer.

**ESCI 458      THERMODYNAMICS/KINETICS FOR EARTH SCIENTISTS (3)**

Thermodynamics and kinetics for the special needs of Earth scientists covering the basic concepts with respect to geochemical applications, e.g., equilibrium - nonequilibrium concepts, steady state, delta G dependence of reactions, rate models, etc. Cross-listed with CHEM 458. Offered Fall. Instructor(s): Luttgé.

**ESCI 460      GEOLOGICAL AND GEOPHYSICAL FLUID DYNAMICS (3)**

Advanced course in the foundations of fluid mechanics and its application to Earth science. Aspects of continuum mechanics, heat and mass transfer, and the rheologic behavior of materials will be covered in developing the fundamental laws that describe fluid motion. Applications include atmospheric dynamics, mantle and lithospheric dynamics, and hydrogeology. Pre-requisite(s): MATH 211 and MATH 212. Instructor(s): Lenardic.

**ESCI 461      SEISMOLOGY I (3)**

Principles of elastic wave propagation, the determination of Earth structure, and the understanding of earthquake physics. Cross-listed with CAAM 441. Pre-requisite(s): ESCI 442. Offered Fall. Instructor(s): Zelt; Levander; Niu.

**ESCI 462 TECTONOPHYSICS (3)**

Applications of continuum physics to the deformation, flexure, heat transfer, and gravity field of the lithosphere. Prerequisite(s): (MATH 102 or MATH 112) and (PHYS 102 and PHYS 112 or PHYS 126). Recommended prerequisite(s): MATH 212. Instructor(s): Gordon.

**ESCI 463 ADVANCED STRUCTURAL GEOLOGY I (4)**

Mechanics and deformation of rocks in the brittle regime, i.e., within Earth's shallow crust, with emphasis on large and small scale deformation structures, their origins, and their tectonic settings. Prerequisite(s): ESCI 323. Offered Spring. Instructor(s): Morgan.

**ESCI 464 GLOBAL TECTONICS (3)**

Geometrical aspects of plate tectonics, the 3 traditional types of plate boundaries, instantaneous plate motions, earthquakes and faulting, space geodesy, geomagnetic reversals, paleo-magnetic poles, hotspots, "absolute" plate motion, true polar wander, driving forces, diffuse plate boundaries, plate nonrigidity, and rheology of the lithosphere. Offered Spring. Instructor(s): Gordon.

**ESCI 466 ADVANCED STRUCTURAL GEOLOGY II (4)**

Mechanics and deformation of rocks in the ductile regime, i.e., within Earth's deep crust, and upper mantle. Prerequisite(s): ESCI 323. Offered Fall.

**ESCI 467 GEOMECHANICS (3)**

An examination of deformation and failure processes within the Earth's shallow crust, with a focus on rock and sediment mechanics, and associated fluid processes. Emphasis will be on geologic applications, including sediment consolidation, slope stability, fault mechanics, and earthquake nucleation and rupture. Offered Fall. Instructor(s): Morgan; Dugan.

**ESCI 481 UNDERGRADUATE RESEARCH IN EARTH SCIENCE****(1 TO 6)**

Advanced work adapted to the needs of the individual undergraduate student reading. Repeatable for Credit.

**ESCI 491 SPECIAL STUDIES FOR UNDERGRADUATES (1 TO 6)**

Work in Earth Science adapted to the needs of individual undergraduate research. Repeatable for Credit.

**ESCI 501 SPECIAL STUDIES FOR GRADUATE STUDENTS (1 TO 15)**

Advanced work in Earth science adapted to the needs of individual graduate students. Repeatable for Credit.

**ESCI 504 SILICICLASTIC DEPOSITIONAL SYSTEMS (3)**

Study of modern and ancient sedimentary environments with emphasis on field work. Depositional models examined in relation to climatic, oceanographic, and tectonic influences. Pre-requisite(s): ESCI 321. Offered Fall. Instructor(s): Anderson.

**ESCI 505 APPLIED SEDIMENTOLOGY I (3)**

Field investigation of sedimentary deposits of northwestern New Mexico to provide students in sedimentology with training in field methods, interpretation of sedimentary deposits, and facies mapping. Pre-requisite(s): ESCI 504. Repeatable for Credit. Instructor(s): Anderson.

**ESCI 506 CARBONATE DEPOSITIONAL SYSTEMS (3)**

Characterization of modern and ancient, shallow and deep sedimentary environments and facies. Includes examination of different depositional models in relation both to climate and to hydrographic and geographic settings, as well as three field trips. Pre-requisite(s): ESCI 321. Offered Spring. Instructor(s): Droxler.

**ESCI 507 APPLIED SEDIMENTOLOGY II (3)**

Advanced field studies in sedimentary geology. This course is intended to provide graduate students with experience working in sedimentary rocks by working on projects of their own design. Prerequisite(s): ESCI 505. Offered Fall. Instructor(s): Anderson.

**ESCI 508 SEMINAR: GLOBAL SEISMOLOGY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Niu.

**ESCI 509 SEMINAR: DEPARTMENT TYPE-LOCALE FIELD TRIPS****(3)**

Seminar topics may vary. Repeatable for Credit.

**ESCI 510 SEMINAR: ADVANCED SEISMOLOGY (3)**

Seminar topics may vary. Repeatable for Credit.

**ESCI 511 PUTTING EARTH SCIENCE INTO ACTION (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Henning.

**ESCI 512 SEMINAR: CARIBBEAN (1)**

Seminar topics may vary. Repeatable for Credit.

**ESCI 515 GEOPHYSICAL FIELD WORK FOR EDUCATORS (3)**

This course consists of 2 weeks of geophysical field work and is designated for in-service K-12 teachers. Instructor permission required. Repeatable for Credit. Limited enrollment. Instructor(s): Henning.

**ESCI 516 SEMINAR: TOPICS ON CARBONATES (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Droxler.

**ESCI 517 SEMINAR: SPECIAL TOPICS IN HIGH TEMPERATURE GEOCHEMISTRY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Lee.

**ESCI 518 DIMENSIONAL ANALYSIS IN EARTH SCIENCE (1)**

Seminar: Dimensional Analysis in Earth Science The basics of dimensional analysis and scaling analysis will be covered. The seminar will mainly apply these analysis tools to a range of earth science problems. Repeatable for Credit. Instructor(s): Lee; Lenardic.

**ESCI 519 SEMINAR: SEISMOLOGY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Levander.

**ESCI 520 SEMINAR: SEISMOLOGY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Levander.

**ESCI 521 SEMINAR: TECTONICS OF CONTINENTAL MARGINS (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Sawyer.

**ESCI 522 SEMINAR: ADVANCED TOPICS IN GEOFLUIDS, GEOTHERMICS, AND PLANETARY EVOLUTION (3)**

Seminar topics may vary. Instructor(s): Lenardic.

**ESCI 523 SEMINAR: SEISMIC MODELING AND INVERSE METHODS (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Zelt.

**ESCI 524 SEMINAR: ADVANCED TOPICS IN EARTH STRUCTURE AND DEFORMATION (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Morgan.

**ESCI 525 SEMINAR: VOLCANOTECTONICS (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Morgan.

**ESCI 526 SEMINAR: DEVELOPMENTS IN STRUCTURAL GEOLOGY (2)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Morgan.

**ESCI 527 PRINCIPLES AND PRACTICES OF PETROLEUM GEOCHEMISTRY IN EXPLORATION AND EXPLOITATION (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Bissada.

**ESCI 528 SEMINAR: ADVANCED TOPICS IN HYDROGEOLOGY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Dugan.

**ESCI 530 TEXAS PRAIRIES LAND USE & SOIL BIOGEOCHEMISTRY (1)**

This class will focus how land use changes on Texas prairie land affects regional carbon, nitrogen, and water cycling. This class will meet once per week and will include at least 2 field trips to the Katy Prairie Conservancy. Repeatable for Credit. Instructor(s): Masiello.

**ESCI 531 SEMINAR: ADVANCED GLOBAL TECTONICS (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Gordon.

**ESCI 532 SEMINAR: TOPICS IN SEDIMENTOLOGY (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Anderson.

**ESCI 535 ADVANCED TOPICS IN GEOCHEMISTRY (3)**

Seminar topics may vary. Cross-listed with CHEM 535. Instructor(s): Luttge.

**ESCI 536 SEMINAR: DEPARTMENT FIELD TRIP (2)**

Seminar topics vary depending on location of field trip. Instructor(s): Droxler.

**ESCI 542 SEISMOLOGY II (3)**

Review of elastodynamics. Calculation of synthetic seismograms using asymptotic and finite-difference methods, wave propagation in layered and random media. Seismic migration and inversion using finite-difference. Kirchoff, and frequency-wavenumber methods. Offered alternate years. Instructor(s): Levander; Symes; Zelt.

**ESCI 562 ADVANCED TOPICS IN GEOPHYSICS (3)**

Seminar topics may vary. Repeatable for Credit. Instructor(s): Levander.

**ESCI 800 THESIS RESEARCH (1 TO 15)**

Prerequisite(s): Students must pass the preliminary exam before taking this course. Repeatable for Credit.

## FREN (FRENCH STUDIES)

### School of Humanities/Center for Study of Languages

**FREN 101 ELEMENTARY FRENCH LANGUAGE AND CULTURE I (5)**  
Introductory French. Concentration on all four language skills. Supplemented by work in the Language Resource Center. Limited enrollment. URL: lang.rice.edu/French.

**FREN 102 ELEMENTARY FRENCH LANGUAGE AND CULTURE II (5)**  
Continuation of FREN 101. Pre-requisite(s): FREN 101, or placement test. Limited enrollment. URL: lang.rice.edu/French.

**FREN 127 IN THE MATRIX: ON HUMAN BONDAGE AND LIBERATION (3)**  
Using the film "The Matrix" as a point of reference, this course presents celebrated explorations of servitude and emancipation -- from religious mysticism to Marxism and artistic modernism. Texts by Lao Tzu, Farid ud-Din Attar, Plato, Freud, Marx, Baudelaire, J.S. Mill, Proust, de Beauvoir, Malcolm X, Marcuse, Baudrillard. Course taught in English. Cross-listed with FSEM 127. Limited enrollment. Not offered this academic year. Instructor(s): Wood.

**FREN 131 NO HAPPY ENDINGS: TRAGEDY IN LITERATURE AND FILM (3)**  
Tragedy stages the sufferings and fall of a hero. It excites pity and fear. Why, then, do we take pleasure in tragedy? This course explores the importance of tragedy in Western culture through a reading of plays by Sophocles, Shakespeare, Racine, and Ibsen. Films include works by Robinson and Schlöndorff. Cross-listed with CLAS 131, FSEM 131. Must be in one of the following Classification(s): Freshman. Not offered this academic year. Instructor(s): Shea.

**FREN 133 AMERICA THROUGH FRENCH EYES (3)**  
The United States has always been a source of fascination -- both attraction and repulsion --for the French. This course aims to understand American culture and identity as revealed by transatlantic encounters with the French. We will study French intellectuals' observations from Tocqueville to Simone de Beauvoir as well as images of America in French popular culture. Cross-listed with FSEM 133. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Fette.

**FREN 201 INTERMEDIATE FRENCH LANGUAGE AND CULTURE I (4)**  
Communication based course. Focuses on the functional use of the language through linguistic, sociocultural and situational contexts. Develops all four language skills (listening, speaking, reading, writing). Pre-requisite(s): FREN 102, or placement test. Limited enrollment. URL: lang.rice.edu/French.

**FREN 202 INTERMEDIATE FRENCH LANGUAGE AND CULTURE II (4)**  
Continuation of FREN 201. Pre-requisite(s): FREN 201, or placement test. Limited enrollment. URL: lang.rice.edu/French.

**FREN 221 CONTEMPORARY FRENCH SOCIETY (3)**  
This course aims to give students an understanding of French Civilization through exploration of the social, cultural, and political issues that define France today. Course taught in English. Not offered this academic year. Instructor(s): Fette.

**FREN 222 AP CREDIT IN FRENCH LANGUAGE (4)**  
This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**FREN 223 AP CREDIT IN FRENCH LANGUAGE (4)**  
This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**FREN 225 AP CREDIT IN INTERMEDIATE FRENCH (3)**  
This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**FREN 226 AP CREDIT IN INTERMEDIATE FRENCH (3)**  
This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**FREN 301 ADVANCED FRENCH FOR WRITTEN AND ORAL COMMUNICATION (3)**

Aimed at developing competence in oral and written expression, with the special emphasis on stylistic variations, lexical nuances, and complex grammatical structures. Drawing on literary and journalistic sources, students will practice different styles of writing. Besides working on an individual project, students will create a collaborative story of their own invention. Pre-requisite(s): FREN 202, or placement test. Limited enrollment. Offered Fall. URL: lang.rice.edu/French.

**FREN 303 CULTURE AND COMMUNICATION: PARIS (3)**

Overview of the history of Paris both as a city and a capital and as a cultural, intellectual, and economic center through a study of texts, music, and films. Equal emphasis will be placed on language skills and content. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Instructor(s): Nelson-Campbell.

**FREN 304 CULTURE AND COMMUNICATION: PROVINCES OF FRANCE (3)**

Overview of the amazing diversity in the history, languages, economic bases, traditions, and cultures of the original provinces in order to arrive at a better understanding of France as it exists today. Includes texts, music and films. Equal emphasis will be placed on language skills and content. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Instructor(s): Nelson-Campbell.

**FREN 306 DUMAS AND THE THREE MUSKETEERS IN CONTEMPORARY FRENCH CULTURE (3)**

More than one and a half centuries after its publication, Dumas' internationally acclaimed novel finds multiple reincarnations in contemporary French society. The novel will serve as a guide on a tour into French history and culture -past and present. The course will include texts, music, films, and writing workshops. Prerequisites: FREN 202 or placement exam or AP credit or permission of instructor. Department permission required.

**FREN 311 MAJOR LITERARY WORKS AND ARTIFACTS OF PRE-REVOLUTIONARY FRANCE (3)**

Study of French culture, literature, and artifacts from the Middle Ages until the Revolution. Course conducted entirely in French. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Offered Fall. Instructor(s): Shea.

**FREN 312 MAJOR LITERARY WORKS AND ARTIFACTS OF POST-REVOLUTIONARY FRANCE: THE ROMANTIC LEGACY (3)**

Fall Semester: French literature and cinema- from romanticism to postmodernity. The rise of capitalism, imperialism, globalization; romantic love and artistic ecstasy as attempts to deal with the "death of God"; can we distinguish "great works" from mere entertainment or "cultural constructions?" Spring Semester: Study of 19th- and 20th-century fiction through the special lens of Romantic imagination. Readings from Chateaubriand, Desbordes-Valmore, Claire de Duras, Musset, Hugo, Baudelaire, Flaubert, Proust, Prevert, and the new novelists. Emphasis on discussion and close textual analysis, all in French. Prerequisite(s): FREN 202, or placement test or permission of instructor. Offered Spring. Instructor(s): Harter.

**FREN 318 STRUCTURE OF FRENCH (3)**

The primary objective of this course is to present contemporary French as a dynamic linguistic system shaped by historical, cognitive and sociological developments. Beyond the specific consideration of French, this course is concerned with the historical, psychological, and sociological dimensions that enter into the description of any language. Cross-listed with LING 318. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Not offered this academic year.

**FREN 321 INTRODUCTION TO FRENCH SOCIETY AND CULTURE (3)**

This course provides grounding in social, political, cultural, and economic aspects of contemporary France. The course will focus on themes such as youth culture, Europeanization, immigration, and gender debates. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Offered Spring. Instructor(s): Fette.

**FREN 332 FRENCH PHONETICS (3)**

Contrastive analysis of the French sound system including key areas as diction and articulation of French speech with emphasis on class as well as laboratory practice. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Not offered this academic year.

**FREN 336 WRITING WORKSHOP (3)**

The course will focus on the practice of writing as a discursive discipline. It will also closely examine, from both a stylistic and rhetorical point of view, creative and critical prose by Barthes, Djebbar, Sarraute, and others. Required of majors. Open to non-majors if space is available. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Offered Spring. Instructor(s): Shea.

**FREN 340 EXOTICISM IN THE ENLIGHTENMENT (3)**

This course will focus on French representations of the Orient and the Pacific in the eighteenth century. Readings include novels, travel journals and essays by Montesquieu, Rousseau, Diderot, and Bougainville, among others. We will conclude the course by turning to the nineteenth century and the paintings of Gauguin and Delacroix. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Shea.



**FREN 355 MODERN SHORT STORY: TOWARDS AN ETHICS OF FICTION (3)**

Study of great works in American and European short fiction of the 19th centuries, with special attention to the ethical dimensions that this (and all) fiction articulates. Selected critical essays will complement readings from Melville, Flaubert, Mann, Maupassant, Gogol, Wilde, Chekhov, Gilman, Kafka, O'Connor, Carver, and Garcia-Marquez. Does not count toward French major. Cross-listed with ENGL 355. Offered Fall. Instructor(s): Harter.

**FREN 360 WOMEN, SEXUALITY, AND THE LITERARY (3)**

Introduction to women writers and to women as objects of representation in fiction and in poetry since the Revolution. Special attention to the body and to sexuality as these impinge both on writer and represented. Cross-listed with SWGS 412. Pre-requisite(s): FREN 301 or FREN 311 or FREN 312 or FREN 336, or placement test or permission of instructor. Offered Fall. Instructor(s): Harter.

**FREN 373 QUEBEC, P.Q., CANADA (3)**

A group project, the class will attempt to define Quebec's unique status through student-selected topics such as immigration, pluri-lingualism, national sovereignty, cultural production, and the like. The course will cover literature and visual texts (fine arts, cinema) as well as historical and political ones. It will also offer a practicum in French writing. Pre-requisite(s): FREN 202, or placement test or permission of instructor. Recommended prerequisite(s): FREN 301 or 312. Not offered this academic year. Instructor(s): Aresu.

**FREN 387 IMAGES OF CONTEMPORARY FRANCE (3)**

The course will deal with the sociopolitical and intellectual history of post-war France. We will cover the advent of the Fifth Republic, decolonization, May '68 and political dissent, modernization and the postmodern condition, and France and the construction of Europe. Texts by Borne, Edmiston, and Dumenil. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Goux.

**FREN 401 TRANSLATION (3)**

Exploration of the theory and practice of translation. Includes translation of modern texts from and into English. Recommended: AP credit or placement exam. Offered Spring. Instructor(s): Fette.

**FREN 403 SPECIAL TOPICS (1 TO 5)**

Topics may vary. Please consult with the department for additional information. Repeatable for Credit.

**FREN 404 BEGINNINGS OF THE LANGUAGE AND LITERATURE OF FRANCE (3)**

This course includes and external history of the French language, an examination of hagiographic literature and the *chanson de geste* in their cultural and artistic contexts, as well as bibliographic component to acquaint the students with library tools available for research emphasizing medieval resources but not excluding those for later periods. Student will acquire a reading knowledge of Old French. Course taught in French. Cross-listed with MDST 404. Recommended: Prerequisite(s): At least two upper-level French courses. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 407 FRENCH CINEMA: PARIS-HOLLYWOOD (3)**

Introduction to French cinema. We will study the development of French cinema, with particular attention to the relationship between French film and Hollywood. Films include works by Renoir, Bresson, Cluzot, Truffaut, Godard, Tati, Varda, Kieslowski. Offered Spring. Instructor(s): Shea.

**FREN 415 COURTLY LOVE IN MEDIEVAL FRANCE (3)**

Study of the Occitan and Old French poetry that served as the source of the kind of love that came to be called "Amour courtois" in the nineteenth century. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 416 LITERATURE AND CULTURE OF THE MIDDLE AGES: KING ARTHUR (3)**

Examination of the origins of the legend of King Arthur and reasons for its popularity, particularly in literature of the French Middle Ages but also in other medieval literatures of Western Europe. Includes discussion of the legend's influence in diverse areas even in modern times. Cross-listed with MDST 436. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 423 MODERN FRENCH PAINTERS AND THEIR WRITERS (3)**

Fascinated by painting, modern and contemporary writers have produced significant literary commentaries that reveal affinities with painters whose artistic "questioning" they shared. In this course, we will study some of the encounters between these painters and their writers. Among them: Picasso (commented by Apollinaire, Cocteau, Breton, Soller), Braque (commented by Ponge, Paulhan, Malraux, Saint John Perse), and others. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Goux.

**FREN 430 17TH CENTURY (3)**

Thematic approach to examining the main political, religious, philosophical, and literary discourses of the golden age of absolutism. Pre-requisite(s): FREN 311, or placement test or permission of instructor. Not offered this academic year.

**FREN 449 NATIONAL IDENTITY AND PUBLIC MEMORY IN FRENCH SOCIETY (3)**

This course identifies events, symbols, and shared experiences, which constitute collective French Memory, and examines how public memory has shaped national identity in contemporary France. Offered Spring. Instructor(s): Fette.

**FREN 450 TOPICS IN 19TH CENTURY LYRIC (3)**

Study of the poetry and prose poetry of the 19th century from the Romantic period to the Symbolist era, through such writers as Desbordes-Valmore, Lamartine, Musset, Vigny, Hugo, Nerval, Baudelaire, Verlaine, Rimbaud, and Mallarme. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Harter.

**FREN 453 IMMIGRATION AND CITIZENSHIP IN CONTEMPORARY FRANCE (3 TO 4)**

This course examines the impact of immigration on contemporary French society and analyzes debates over citizenship, integration, and multiculturalism. Students earn 3 credits for the course or 4 credits if participating in a supplementary 10-day study trip to France at the end of the semester in May. Scholarships available. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Fette.

**FREN 467 POSTMODERN BREAK IN FRENCH PHILOSOPHY (3)**

A study of the questioning of philosophical modernity (starting with Descartes and the Enlightenment philosophers) by structuralist and poststructuralist thinkers and theorists of the postmodern condition. Among contemporary authors studied will be Lacan, Derrida, Foucault, Lyotard, and others. Prerequisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Not offered this academic year. Instructor(s): Goux.

**FREN 473 HISTORY AND CULTURE OF MODERN QUEBEC (3)**

On the history and culture of Quebec from the 18th century to the present, the seminar also examines issues of language and cultural identity. It will include such figures as Hemon, Carrier, Godbout, Maillet, and Hebert (literature); Pellán, Riopelle, and Bordous (art); and Jutra and Arcand (cinema). Limited enrollment. Offered Fall. Instructor(s): Aresu.

**FREN 480 COCTEAU: FILMMAKER, NOVELIST, POET (3)**

Poet, novelist, playwright, essayist, painter, Jean Cocteau (1889-1963) a protean creator, was also the first French writer to become a famous film-maker. During his career, J. Cocteau was close to most of the avant-garde movements of this time: Cubism, Dadaism, Surrealism. The goal of this course is to discover the various aspects of this multi-faceted work, where cinema and poetry meet under the sign of Orpheus. Pre-requisite(s): FREN 311 or FREN 312, or placement test. Limited enrollment. Offered Spring. Instructor(s): Goux.

**FREN 482 DISCOURSES OF DISSIDENCE (3)**

Undergraduate version of FREN 582, with shorter reading list and senior level research paper. Graduate/Undergraduate version: FREN 582. Pre-requisite(s): FREN 311 and FREN 312, or placement test or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Aresu.

**FREN 490 UTOPIA AND THE FUTURE (3)**

This course will explore utopia and how historical future is anticipated in French literature and philosophy; study of the most important utopists (from Cyrano de Berderac to Fourier and Dejacque); the rise of new expectations and fears in a more technical and globalized world (from Jules Verne to the present). Includes sociological, religious and philosophical interpretations of utopia and of the anticipation of the future. Pre-requisite(s): FREN 311 or FREN 312 or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Goux.

**FREN 494 THE NOVEL IN FRENCH- 18TH CENTURY TO POST-COLONIALISM (3)**

Form and themes of the novel as problematic engagements with the evolution of art, capitalism, the family and gender, the sacred, subjectivity and imperialism. Authors include: the Marquis de Sade, Balzac, Flaubert, Proust, Colette, Sartre, Robbe-Grillet, Cheikh Hamidou Kane, Camara Laye. Prerequisite(s): FREN 311 or FREN 312. Not offered this academic year. Instructor(s): Wood.

**FREN 500 THESIS RESEARCH (M.A.) (1 TO 15)**

Repeatable for Credit. Not offered this academic year.

**FREN 503 SPECIAL TOPICS (3)**

Topics may vary. Please consult department for additional information. Repeatable for Credit. Not offered this academic year.

**FREN 504 BEGINNINGS OF THE LANGUAGE AND LITERATURE OF FRANCE (3)**

This course includes an external history of the French language, an examination of hagiographic literature and the *chanson de geste* in their cultural and artistic contexts, as well as a bibliographic component to acquaint the students with library tools available for research emphasizing medieval resources, but not excluding those for later periods. Students will acquire a reading knowledge of Old French. Course taught in French. Recommended: Prerequisite(s): At least two upper-level French courses. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 510 THE LITERARY AND HISTORICAL IMAGE OF THE MEDIEVAL WOMAN (3)**

Comparison and contrast of the presentation of the medieval woman in literature with extant evidence of historical women from contemporary documents and records. Graduate/Undergraduate version: MDST 411. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 515 COURTLY LOVE IN MEDIEVAL FRANCE (3)**

Study of the Occitan and Old French poetry that served as the source of the kind of love that came to be called "Amour courtois" in the nineteenth century. Not offered this academic year. Instructor(s): Nelson-Campbell.

**FREN 540 WHY SADE? (3)**

Why read Sade today? Has the myth of the divine Marquis run its course? Readings by Sade, Diderot, Rousseau, Laclos, Bataille, Blanchot, Klossowski, and Beauvoir. Films include Quills, Marat/Sade and L'Age d'or. Not offered this academic year. Instructor(s): Shea.

**FREN 541 FRENCH ENLIGHTENMENTS (3)**

What is Enlightenment? Does it define a period, an idea, a group of writers? Was there one Enlightenment or many? What is specific to the French Enlightenment? Readings include key eighteenth-century texts and major attempts to define Enlightenment (Casirer, Gay, Habermas, Roche, Gordon). Not offered this academic year. Instructor(s): Shea.

**FREN 549 NATIONAL IDENTITY AND PUBLIC MEMORY IN FRENCH SOCIETY (3)**

This course identifies events, symbols, and shared experiences, which constitute collective French memory, and examines how public memory has shaped national identity in contemporary France. Graduate students will write a 25-page research paper on topic of their choice related to themes of the course. Not offered this academic year. Instructor(s): Fette.

**FREN 550 FRANCE-AMERICA: IMAGE AND EXCHANGE (3)**

The course analyzes French and American culture and identity through transatlantic encounters. We study intellectual's observations of American life (Tocqueville, Beauvoir, Baudrillard) and images of America in French novels, comic strips, films. We also examine American gazes toward the French. The course introduces students to interdisciplinary study of intercultural exchange and representation. Offered Fall. Instructor(s): Fette.

**FREN 555 FROM NOSTALGIA TO HYSTERIA: BALZAC, STENDHAL, FLAUBERT, ZOLA (3)**

Study of 19th-century fiction through its discourses of displacement: its depiction of nostalgia and of "homelessness" in the first half of the century and of the crowd, the flaneur, and hysteria in the second. Readings in lyric, short fiction, the novel, and in critical theory. Not offered this academic year. Instructor(s): Harter.

**FREN 564 LITERATURE, ART AND PSYCHOANALYSIS (3)**

Study of selected works in literature and art through the lens of psychoanalysis, and of psychoanalysis through the lens of literary and visual art. Not offered this academic year. Instructor(s): Harter.

**FREN 565 SURREALIST AND AVANT-GARDE NARRATIVES (3)**

The avant-garde and the logic of capitalism. The post-romantic precursors and the rise of a sacred and transgressive Art (Baudelaire, Mallarme, Rimbaud, Lautreamont, de Nerval). Ecstasy beyond the constructed subject: Breton, Artaud, Bataille, Aragon. Not offered this academic year. Instructor(s): Wood.

**FREN 566 THE NARRATIVES AND THE OTHER ARTS (3)**

The seminar will focus on the aesthetic and ideological interplay between literature and the other arts. Figures and topics will include: neoclassical poetry and painting; Segalen, and Gauguin's Tahiti; Baudelaire's art criticism; Delacroix, Chasseriau, Fromentin, Djébar, and French Orientalism; Cocteau, or the poet as film-maker, Simon and the Baroque; Robbe-Grillet, Duras, and the cinema; Ben Jelloun and Giacometti. Not offered this academic year. Instructor(s): Aresu.

**FREN 567 THE POSTMODERN BREAK IN FRENCH PHILOSOPHY (3)**

Study of the questioning of philosophical modernity (starting with Descartes and the Enlightenment philosophers) by structuralist and poststructuralist thinkers and theorists of the postmodern condition and the post-history conjecture. Emphasis on the conflict between humanism and anti-humanism, including in its theological and aesthetical ramifications: Foucault, Lyotard, Levinas, Castoriadis, and others. Not offered this academic year. Instructor(s): Goux.

**FREN 568 FRENCH PHILOSOPHY (3)**

Survey of moral philosophy from Descartes to today, exploring the relationship between the individual and society, the problem of freedom and values, questions of universality, humanism, the important moments of the constitution and deconstitution of the subject. Includes philosophy of Descartes, Rousseau, Condorcet, Comte, Guyau, Durkheim, Fouillee, Bergson, Sartre, Foucault, and others. Not offered this academic year. Instructor(s): Goux.

**FREN 570 SPECIAL TOPICS: VERSIONS OF OEDIPUS (3)**

Through the myth, the tragedies, the complex, the Greek figure of king Oedipus has haunted our literary imagination, troubled our philosophical thought, and nourished our psychoanalytical investigation. This seminar explores this well-known figure in French modern playwrights who revisited the tragic character, as well as in the various philosophical and theoretical interpretations of the myth and its ramifications. Instructor(s): Goux.

**FREN 571 FRENCH PHILOSOPHERS AND IMAGES (3)**

Cinema, psychoanalysis, modern painting opened a new way of looking at images. This seminar, based on references to Bergson, Sartre, Merleau-Ponty, Foucault, Barthes, Lyotard, Derrida, Deleuze, Castoriadis, Dagognet, etc... will explore the philosophical and aesthetic problems related to the role and power of images and to the relationships between the visual and the textual, including through paintings and films. Limited enrollment. Not offered this academic year. Instructor(s): Goux.

**FREN 572 PROUST (3)**

Extensive close textual readings and broad-ranging meditations on the meaning of "A la recherche du temps perdu" in terms of the history of artistic modernism and social modernity. Taught alternately in French and English. Not offered this academic year. Instructor(s): Wood.

**FREN 574 ESTHETICS AND POLITICS OF FRANCOPHONE (3)**

The seminar focuses on various expressions of "francophone" as a both legitimated and contested construct of cultural and political identity. Encompassing a plurality of geo-cultural areas, topics range from "Legitimate defense" to negritude, post-colonialism, antil-leanity, creoleness, quebecitude, and trans-nationalism. Not offered this academic year. Instructor(s): Aresu.

**FREN 578 CONTEMPORARY FRENCH THOUGHT: TOWARD A SYMBOLIC ECONOMY (3)**

Exploration of the idea of a "symbolic economy" that transforms notions of production, exchange, and consumption in anthropology, semiotics, psychoanalysis, and literature. Includes Mauss and Levi-Strauss (on "exchange of goods, words, and women"), later developments of Bataille, Lacan, Baudrillard, Irigaray, and the theory and practice of "economic criticism" (e.g., Balzac, Zola, Gide). Not offered this academic year. Instructor(s): Goux.

**FREN 579 MARX, BATAILLE, BAUDRILLARD, POSTMODERNITY (3)**

Taught in English. Exploration of the shift from a Marxist political economy of class struggle, through Bataille's "general economy" (economic activity as a "cosmic phenomenon") to Baudrillard's "indetermination of the code" and "simulation" in postmodernity. Texts by Marx, Mauss, Bataille, Athusser, Ernest Mandel, and Baudrillard. Not offered this academic year. Instructor(s): Wood.

**FREN 580 GILLES DELEUZE (3)**

This course provides an advanced introduction to Deleuze's work, from the earliest writings to the final period. Emphasis: Deleuze's relation to the philosophical tradition, his differences from and similarities to other French "poststructuralists," and the uses to which his work has been put by others. Taught in English. Instructor(s): Wood.

**FREN 582 DISCOURSES OF DISSIDENCE (3)**

Seminar centers on dissidence as a concept and a practice, both ideological and esthetic. Covers a selection of figures, genres, media, and movements of "French" expression from Montaigne to present. Limited enrollment to 12. Open to seniors with approval from instructor. Also, open with texts in English to non majors. Graduate/Undergraduate version: FREN 482. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Wood.

**FREN 583 SOCIOPOLITICAL INTERPRETATION OF LITERATURE (3)**

Analysis and interpretation of several major literary texts from the beginning of the 19th century to the contemporary period, from a sociological and political view. Vigny, Balza, Zola, Gide, Mauriac, Malraux, Robbe-Grillet, Sollers. Theoretical texts by Mme de Stael, Tocqueville, Goldman, Sartre, Bourdieu. Repeatable for Credit. Offered Spring. Instructor(s): Goux.

**FREN 584 AESTHETIC THEORIES OF MODERNISM AND POSTMODERNISM (3)**

Exploration of such artistic and literary movements as Cubism, Dada, Surrealism, "Refus Global," "Lettrisme," "Situationnisme," "Oulipo," "Tel Quel," and "Les Perpendiculaires." How does one define the "avant-gardes?" Offered Spring. Instructor(s): Goux.

**FREN 585 NOVEL FROM BELLE EPOQUE TO 1950 (3)**

Survey of the evolution of the novel and the vicissitudes of the modern subject and identity. Includes Proust, Gide, Malraux, Drieu la Rochelle, de Beauvoir, Sartre, Genet, Camus, and Sarraute. Not offered this academic year. Instructor(s): Wood.

**FREN 587 20TH CENTURY NOVEL IN FRENCH (3)**

This course will explore the construction of the modern self in a variety of French and Francophone novels of the twentieth century. Topics include relationship between the self and narrative form; the role of memory; violence and representation; and the construction of gender, sexuality, nationality and race. Not offered this academic year.

**FREN 588 CONSCIOUSNESS, CONSTRUCTIONISM, THE SUBJECT AND THE SOUL (3)**

Taught in English. Is the subject a "construction"? Is consciousness a neurological event? Philosophy, religion and aesthetics in the face of cultural critique, cognitive science and post structuralism. (Mostly) short readings from Parmenides, Plato, Aristotle, Descartes, Hume, Kant, Nietzsche, Husserl, Heidegger, Sartre, Bataille, Lacan, Foucault, Derrida, cognitive science, philosophy of mind. Limited enrollment. Not offered this academic year. Instructor(s): Wood.

**FREN 589 FRENCH THEORY FROM SAUSSURE TO IRIGARAY, PART I (3)**  
Background in Freud, Marx, Saussure; then Levi-Strauss Benveniste, Althusser, Sartre, de Beauvoir, Lacan, Bataille, Fanon, Barthes, Foucault, Derrida, Baudrillard, Irigaray, Lyotard, Deleuze. Taught over 2 semesters, in English. Offered Fall. Instructor(s): Wood.

**FREN 590 FRENCH THEORY: FROM SAUSSURE TO IRIGARAY, PART II (3)**  
Background in Freud, Marx, Saussure, then Levi-Strauss, Benveniste, Althusser, Sartre, de Beauvoir, Lacan Bataille, Fanon, Barthes, Foucault, Derrida, Baudrillard, Irigaray, Lyotard, Deleuze. Taught over 2 semesters, in English. Requirements: FREN 589 Part I is desirable but not indispensable. Offered Fall. Instructor(s): Wood.

**FREN 600 INDEPENDENT STUDY (1 TO 15)**  
Repeatable for Credit. Offered Fall & Spring.

**FREN 700 SUMMER GRADUATE RESEARCH (1 TO 12)**  
Repeatable for Credit.

**FREN 800 THESIS RESEARCH PH.D. (1 TO 15)**  
Repeatable for Credit. Offered Fall & Spring.

## FSEM (FRESHMAN SEMINAR)

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### School of Humanities/Humanities Division

#### **FSEM 101 FRESHMAN SEMINAR: SOCRATES: THE MAN AND HIS PHILOSOPHY (3)**

This discussion-style seminar will consider how Socrates practiced philosophy; how Plato represented Socrates and Socratic philosophy in writing, and what effect Socrates had on Athens and his fellow Athenians. Readings will consist mainly of Plato's Socratic dialogues, with emphasis on the Apology and Gorgias. In addition to papers, each participant will make one presentation and lead one discussion. Cross-listed with CLAS 101. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Yunis.

#### **FSEM 105 LANGUAGE, GENDER AND SEXUALITY (3)**

This course examines the role that gender, biological sex, and sexuality play in the language varieties that people use. We will see that although all cultures have specified gender roles, and all cultures mark gender through language varieties, those differences are not, I promise, what you think they are. Cross-listed with LING 105. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Niedzielski.

#### **FSEM 110 LITERATURE AND DEMOCRACY (3)**

Course examines how writers respond to the developments and problems of democratic societies. Topics include: civil disobedience and just dissent; the civil war and the extension of the franchise; cruel and unusual punishment exercised by governments; and the relationship between privacy and individuality. Requirements: two essays and one class presentation. Cross-listed with HUMA 110. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Wihl.

#### **FSEM 111 MUSICAL LIVES (3)**

Musical biography tends to follow stereotypical patterns that depict composers as heroes who rebel against authority and live on the margins of society. This seminar will focus on the life stories and music of selected 18th and 19th century composers. No musical background necessary. Cross-listed with MUSI 111. Must be in one of the following Classification(s): Freshman. Instructor(s): Ferris.

#### **FSEM 112 GREAT LITERATURE IN GREAT MUSIC (3)**

A study of six famous literary works, from classical civilization to expressionism, and their incarnation in famous musical compositions. Authors include Vergil, Shakespeare, Beaumarchais, Pushkin, Goethe, and Buchner; paired pieces include operas by Berlioz, Verdi, Mozart, Tchaikovsky, Gounod, and Berg. No technical or reading knowledge of music is required. Cross-listed with MUSI 112. Must be in one of the following Classification(s): Freshman. Instructor(s): Citron.

#### **FSEM 121 FROM KAFKA TO THE HOLOCAUST: DISCOURSE IN ALIENATION (3)**

The beginnings of modernity have to be seen in the context of the sociopolitical and intellectual upheavals at the end of the 19th century. Whereas extreme reactionism eventually led to fascism, progressive literature advocated artistic experimentation as manifested in a discourse of alienation (expressionism, dada, Kafka). Holocaust literature reflects the ultimate clash between progressiveness and reactionism. The primary readings will be from Wedekind, Trakl, Kaiser, Hesse, Remarque, Brecht, Celan, Werfel. Taught in English. Cross-listed with GERM 121. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Weissenberger.

**FSEM 122 HISTORY THROUGH GERMAN CINEMA (3)**

The course presents an overview of German history via contemporary German feature films from World War I, through the Weimar and Nazi periods, the postwar years as a Divided Germany into East and West and finally a look at the new generation in Post-unification Germany. Taught in English. All films are subtitled in English. Cross-listed with GERM 122. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Wood.

**FSEM 123 THROUGH TIME AND SPACE: EUROPEAN TRAVEL****STORIES (3)**

A travel story stands at the beginning of European Literature: Homer's *Odyssey*. Since ancient times, literary travel accounts of all sorts, to all destinations, by all means and undertaken with a wide range of different purposes have kept Europeans on the move. First attracted by the exotic and the unknown in the far distance, the interest moved ever closer to the self, and the exploration of the human mind became the most exotic and intriguing journey. Readings include Homer, Swift, Voltaire, Goethe, Heine, Twain, and Verne. Taught in English. Cross-listed with GERM 123. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Steiner.

**FSEM 124 LAW, MORALITY, AND SOCIETY (3)**

A historical introduction to central themes of legal and political thought in the Western tradition from Immanuel Kant to John Rawls, this freshman seminar provides an overview of trends and controversies in modern political thought and society. Topics discussed include "civil rights", "morality", "liberalism", "natural law", "political theology", and "freedom". Taught in English. Cross-listed with GERM 124. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Emden.

**FSEM 125 BETWEEN RESISTANCE AND COLLABORATION: INDIVIDUALS RESPONDING TO NATIONAL SOCIALISM (3)**

Focus on individuals' behavior in Nazi Germany/Austria. Issues of ideology and ethics as Germans and Austrians faced them between 1933-1945. Reflection on values such as courage, civil disobedience, and human rights in today's global society. Taught in English. Cross-listed with GERM 125. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Kecht.

**FSEM 126 THE LEGEND OF KING ARTHUR IN THE MIDDLE AGES (3)**

In the 1100s, people began writing down stories of Arthur, Guinevere, Merlin, and the Knights of the round table using sophisticated techniques of literary composition. Today, these stories count among the great writings of Europe. This course examines the spectrum of medieval stories and histories of Arthur that arose in England, France, and Germany from the beginning to the age of printing, plus some recent revivals. Cross-listed with GERM 126, MDST 126. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Westphal.

**FSEM 127 IN THE MATRIX: ON HUMAN BONDAGE AND LIBERATION (3)**

Using the film "The Matrix" as a point of reference, this course presents celebrated explorations of servitude and emancipation -- from religious mysticism to Marxism and artistic modernism. Texts by Lao Tzu, Farid ud-Din Attar, Plato, Freud, Marx, Baudelaire, J.S. Mill, Proust, de Beauvoir, Malcolm X, Marcuse, Baudrillard. Course taught in English. Cross-listed with FREN 127. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Wood.

**FSEM 128 THE CULTURE OF WAR: VIOLENCE, CONFLICT AND REPRESENTATION (3)**

Focusing on the experience and representation of war in German and European literature, theory, and visual arts. Covers the period from 17th-20th century. Special emphasis on the First World War. Not for the faint-hearted, topics included: destruction, ruins, refugees, massacres, terrorism, victims, spaces of battle, the logic of war. Taught in English. Cross-listed with GERM 128. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Emden.

**FSEM 129 LITERARY LOVE AFFAIRS, LOVE AND PASSION IN EUROPEAN LITERATURE (3)**

Love-stories are usually about a young man who seeks the ideal girl, finally gets her, and becomes as good a Philistine as others. Students examine this philosophical wisdom by reading stories and theoretical texts about love and passion by European authors from the time of Shakespeare to the present. Cross-listed with GERM 129. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Steiner.

**FSEM 130 WOMEN AND NATIONAL SOCIALISM (3)**

Introduction to the Nazi idea of "womanhood" and the actual roles women played during National Socialism. Female perpetrators, Mitläufer, a multiplicity of victims, and to resistance fighters. The course will be taught in English. Cross-listed with GERM 130, SWGS 130. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Kecht.

**FSEM 131 NO HAPPY ENDINGS: TRAGEDY IN LITERATURE AND FILM (3)**

Tragedy stages the sufferings and fall of a hero. It excites pity and fear. Why, then, do we take pleasure in tragedy? This course explores the importance of tragedy in Western culture through a reading of plays by Sophocles, Shakespeare, Racine, and Ibsen. Films include works by Robinson and Schlöndorff. Cross-listed with CLAS 131, FREN 131. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Shea.

**FSEM 133 AMERICA THROUGH FRENCH EYES (3)**

The United States has always been a source of fascination -- both attraction and revulsion -- for the French. This course aims to understand American culture and identity as revealed by transatlantic encounters with the French. We will study French intellectuals' observations from Tocqueville to Simone de Beauvoir as well as images of America in French popular culture. Cross-listed with FREN 133. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Fette.

**FSEM 144 THE ARAB-ISRAELI CONFLICT (3)**

Seminar traces the history and politics of the Arab-Israeli conflict, delving into both Palestinian and Israeli understandings of the past and present using books, documentaries, and films. The course seeks to understand how and at what costs Israeli and Palestinian nationalism's have been constructed and analyzes U.S. involvement in the conflict. Cross-listed with HIST 144. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

**FSEM 150 LATIN AMERICAN SHORT FICTION (EMPHASIS ON BORGES AND CORTAZAR) (3)**

Readings of classic works of short fiction by modern Latin American masters, with special emphasis on the stories of Jorge Luis Borges and Julio Cortazar. Close reading, interpretive essays. Taught in English. Open to first-year students only. Cross-listed with SPAN 150. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Kauffman.

**FSEM 151 FRESHMAN SEMINAR: THE HERO AND HIS COMPANION FROM GILGAMESH TO SAM SPADE (3)**

How does presentation of heroic action illustrate the basic values of society? Historical sources including ancient texts, modern mystery stories, and two "western" movies, show the development of a style of community service linking heroism with alienation. The extent to which women participate will be traced. Cross-listed with HIST 151. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Maas.

**FSEM 152 THE HISPANIC ESSAY (3)**

Readings in English from major modern Spanish and Latin-American essayists, including Miguel de Unamuno, Jose Ortega y Gasset, Maria Zambrano, Jose Marti, Jose Enrique Rodo, Alfonso Reyes, Victoria Ocampo, Gabriela Mistral, Jorge Luis Borges, and Octavio Paz, et al. Close reading and appreciation of essays will be the focus of discussion, presentations, and short interpretive papers. Taught in English. Open to first-year students only. Cross-listed with SPAN 152. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Kauffman.

**FSEM 153 DON QUIXOTE (IN ENGLISH) (3)**

The class will involve close reading and interpretation of Cervantes's immortal novel, "Don Quixote de la Mancha," voted "the best book of all time." Cross-listed with SPAN 153. Limited enrollment. Instructor(s): Castaneda.

**FSEM 160 FRESHMAN SEMINAR: THOMAS JEFFERSON, THE AMERICAN REVOLUTION, AND THE USES OF THE PAST (3)**

Seminar will focus on three dimensions of Thomas Jefferson's life and legacy: first, what he said and did in the American Revolution; second, how he has been understood by historians; and third, how his words, ideas, and actions have been used by successive generations of Americans. Cross-listed with HIST 160. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Gruber.

**FSEM 161 THE USES OF THE PAST (3)**

Seminar analyzes how selected historical events are interpreted at different times and contexts. Sources include history books, novels, movies, court cases and political debates. Specific events studied will vary according to student interest from ancient times to the present. Cross-listed with HIST 161. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Quillen.

**FSEM 163 FRESHMAN SEMINAR: BROWN V. BOARD (3)**

A first year seminar examining the origins and legacies of the civil rights case that all but defined the parameters of modern American society and race relations. Where did the case come from? How was it argued and decided? What have been its consequences? Cross-listed with HIST 163. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Byrd.

**FSEM 164 WHO IS (NOT) A JEW? (3)**

Explore problems with identity--ethnic, political, spiritual--in the case of the other Jew. Consider themes of anti-semitism and philo-semitism, insider and outsider, tradition and innovation. Examine competing views purveyed through diverse media such as literature, film, art, and music. Selected texts from St. Paul, Shakespeare, Dickens, Marx, George Eliot, Freud, Chagall, Cynthia Ozick, Bob Dylan, and Woody Allen. Cross-listed with RELI 164. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Kaplan.

**FSEM 165 FRESHMAN SEMINAR: THE FRENCH REVOLUTION: HISTORIES AND LEGACIES (3)**

Freshman seminar will focus on the French Revolution and the era of Napoleon Bonaparte, 1789-1815. Lectures address three main topics: the history of the Revolution and its main actors; the diverging interpretations offered by historians; and the multiple legacies of the revolutionary period in the modern era. Cross-listed with HIST 165. May not be in any of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Cohen.

**FSEM 170 FRESHMAN SEMINAR: RELIGION AND VIOLENCE (3)**

Seminar explores the nexus of religion and violence as it appears in sacred traditions, as it played out historically, and as it occurs in the contemporary world. Discussions and readings include sociological, psychological, philosophical, and political approaches to religion itself, to violence in general, and particularly religious violence. Cross-listed with HIST 170, RELI 170. Must be in one of the following Classification(s): Freshman. Offered Spring. Instructor(s): Quillen; Carroll.

**FSEM 173 FRESHMAN SEMINAR: SOUTHERN REBELS (3)**

The "South" is often understood to be the most conservative region in the U.S. Seminar will use selected autobiographical texts by "southern rebels" to challenge that idea, and examine the tradition of dissent in the culture and history of the American South. Cross-listed with HIST 173. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Lichtenstein.

**FSEM 176 FRESHMAN SEMINAR: TERROR AND AFRICAN AMERICAN HISTORY (3)**

From the Murder of James Byrd. From the early 1880's to 1978, lynch mobs murdered nearly 5,000 African-Americans. Terror and black responses to it have shaped nearly every aspect of African American history. Seminar examines black society, politics, gender, and culture in the 20th century America against the backdrop of racial violence. Cross-listed with HIST 176. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Byrd.

**GERM (GERMAN)****School of Humanities/Center for Study of Languages****GERM 101 BEGINNING GERMAN I (5)**

The first in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Recommended prerequisite(s): No prior knowledge of German. Limited enrollment. URL: lang.rice.edu/German.

**GERM 102 BEGINNING GERMAN II (5)**

The second in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Pre-requisite(s): GERM 101, or placement test or permission of instructor. Limited enrollment. URL: lang.rice.edu/German.

**GERM 121 FROM KAFKA TO THE HOLOCAUST: DISCOURSE IN ALIENATION (3)**

Freshmen Seminar. The beginnings of modernity have to be seen in the context of the sociopolitical and intellectual upheavals at the end of the 19th century. Whereas extreme reactionism eventually led to fascism, progressive literature advocated artistic experimentation as manifested in a discourse of alienation (expressionism, dada, kafka). Holocaust literature reflects the ultimate clash between progressiveness and reactionism. The primary readings will be from Wedekind, Trakl, Kaiser, Kafka, Hesse, Remarque, Brecht, Celan, Werfel. Taught in English. Cross-listed with FSEM 121. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Weissenberger.

**GERM 122 HISTORY THROUGH GERMAN CINEMA (3)**

Freshmen Seminar. The course presents an overview of German history via contemporary German feature films from World War I, through the Weimar and Nazi periods, the postwar years as a Divided Germany, into East and West, and finally a look at the new generation in Post-unification Germany. Taught in English. All films are substituted in English. Cross-listed with FSEM 122. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Kecht.

**GERM 123 THROUGH TIME AND SPACE: EUROPEAN TRAVEL STORIES (3)**

Freshmen Seminar. A travel story stands at the beginning of European Literature: Homer's Odyssey. Since ancient times, literary travel accounts of all sorts, to all destinations, by all means and undertaken with a wide range of different purposes have kept Europeans on the move. First attracted by the exotic and the unknown in the far distance, the interest moved ever closer to the self, and the exploration of the human mind became the most exotic and intriguing journey. Readings include Homer, Swift, Voltaire, Goethe, Heine, Twain, and Verne. Taught in English. Cross-listed with FSEM 123. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Steiner.



**GERM 124 LAW, MORALITY, AND SOCIETY (3)**

Freshmen seminar. A historical introduction to central themes of legal and political thought in the Western tradition from Immanuel Kant to John Rawls, this freshman seminar provides an overview of trends and controversies in modern political thought and society. Topics discussed include "civil rights", "morality", liberalism, "natural law", "political theology", and "freedom". Taught in English. Cross-listed with FSEM 124. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Emden.

**GERM 125 BETWEEN RESISTANCE AND COLLABORATION: INDIVIDUALS RESPONDING TO NATIONAL SOCIALISM (3)**

Freshmen seminar. Focus on individual's behavior in Nazi Germany/Austria. Issues of ideology and ethics as Germans and Austrians faced them between 1933-1945. Reflection on values such as courage, civil disobedience, and human rights in today's global society. Taught in English. Cross-listed with FSEM 125. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Kecht.

**GERM 126 THE LEGEND OF KING ARTHUR IN THE MIDDLE AGES (3)**

Freshmen seminar. In the 1100s, people began writing down stories of Arthur, Guinevere, Merlin, and the Knights of the round table using sophisticated techniques of literary composition. Today, these stories count among the great writings of Europe. This course examines the spectrum of medieval stories and histories of Arthur that arose in England, France, and Germany from the beginning to the age of printing, plus some recent revivals. Taught in English. Cross-listed with FSEM 126, MDST 126. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Westphal.

**GERM 128 THE CULTURE OF WAR: VIOLENCE, CONFLICT AND REPRESENTATION (3)**

Freshmen Seminar. Focusing on the experience and representation of war in German and European literature, theory, and visual arts. Covers the period from 17th-20th century. Special emphasis on First World War. Not for the faint-hearted, topics include: destruction, ruins, refugees, massacres, terrorism, victims, spaces of battle, the logic of war. Taught in English. Cross-listed with FSEM 128. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Emden.

**GERM 129 LITERARY LOVE AFFAIRS: LOVE AND PASSION IN EUROPEAN LITERATURE (3)**

Freshmen Seminar. According to the German philosopher Hegel, love-stories are usually about a young man who seeks the ideal girl, finally gets her, and becomes as good a Philistine as others. The course invites students to examine this philosophical wisdom by reading select stories and theoretical texts about love and passion by European authors from the time of Shakespeare to the present. Taught in English. Cross-listed with FSEM 129. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Steiner.

**GERM 130 WOMEN AND NATIONAL SOCIALISM (3)**

Freshmen seminar. Introduction to the Nazi idea of "womanhood" and the actual roles women played during National Socialism. Female perpetrators, Mitlaufer, a multiplicity of victims, and to resistance fighters. The course will be taught in English. Cross-listed with FSEM 130, SWGS 130. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Kecht.

**GERM 201 INTERMEDIATE GERMAN I (4)**

The third in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Pre-requisite(s): GERM 102, or placement test or permission of instructor. Limited enrollment. URL: lang.rice.edu/German.

**GERM 202 INTERMEDIATE GERMAN II (4)**

The fourth in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Pre-requisite(s): GERM 201, or placement test or permission of instructor. Limited enrollment. URL: lang.rice.edu/German.

**GERM 222 AP CREDIT IN GERMAN LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**GERM 223 AP CREDIT IN GERMAN LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**GERM 301 ADVANCED GERMAN I (3)**

The fifth in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Pre-requisite(s): GERM 202, or placement test or permission of instructor. Limited enrollment. URL: lang.rice.edu/German.

**GERM 302 ADVANCED GERMAN II (3)**

The sixth in a series of courses, the principal objective of which is to engage students in purposeful communicative tasks designed to develop proficiency and literacy in the languages and cultures of Germany, Austria and Switzerland. Pre-requisite(s): GERM 301, or placement test or permission of instructor. Limited enrollment. URL: lang.rice.edu/German.

**GERM 303 COMPOSITION AND CONVERSATION I: LANGUAGE AND STYLE IN CULTURAL TEXTS (3)**

Discussion and composition based on a variety of reading materials (videos, current German newspapers, websites, short literary texts) and interactional contexts (e.g. partner works, reports, interviews, dialogues). Focus on cultural awareness and topics relating to contemporary German literature, culture, and politics, then and now. Special emphasis on developing writing skills and oral fluency. Taught in German. Pre-requisite(s): GERM 202 or permission of instructor. Offered Fall. Instructor(s): Dupree.

**GERM 304 COMPOSITION AND CONVERSATION II: LANGUAGE AND STYLE IN CULTURAL TEXTS (3)**

This course will work with cultural texts, on-line information and film materials in order to prepare for a deeper understanding of German literary and intellectual sources. We will assess language and styles of literary genres (prose, lyric, drama), nonfictional writings and philosophical materials. Student performance is aimed to move from paraphrasing summary to analytic commentary in oral presentation and written expression. Taught in German. Pre-requisite(s): GERM 303 or permission of instructor. Offered Spring. Instructor(s): Weissenberger.

**GERM 321 EUROPEAN WOMEN FILMMAKERS (3)**

Mapping German Culture. Filmmaking has celebrated its first hundred years. Women's contributions were significant and deserve to widen the film canon for all filmmakers. The course will concentrate on films by European women directors, taking into account aesthetic particularities, gender commitment, and post-feminist attempts. Importance will also be given to the contexts and conditions of women's film production. All films are subtitled in English. Taught in English. Cross-listed with HART 385, HUMA 321, SWGS 358. Limited enrollment. Not offered this academic year.

**GERM 322 MARX, FREUD, EINSTEIN: FOREBEARERS OF MODERNITY (3)**

Mapping German Culture. Like no others, these three thinkers of the 19th and 20th centuries have influenced the intellectual, historical, social and cultural development not only of Germany, but of the entire world. The course examines the works of these authors in the context of their own time as well as their continued importance in the present. Works by Brecht, Christa Wolf, Schnitzler, Kafka will also be considered. Taught in English. Cross-listed with HUMA 322. Not offered this academic year. Instructor(s): Weissenberger.

**GERM 323 WOMEN AND PERFORMANCE IN MODERN GERMAN LITERATURE AND CULTURE (3)**

Through close readings of a wide variety of literary texts as well as film and visual media, this course examines images of femininity in German literature and culture since the Enlightenment, while reassessing the significance of women as performers, writers and spectators. This course will be taught in English. Cross-listed with SWGS 343. Offered Spring. Instructor(s): Dupree.

**GERM 324 BERLIN: RESIDENCE, METROPOLIS, CAPITAL (3)**

Mapping German Culture. The course offers an introduction to German history, politics, and culture as mirrored in the history of the old and new German capital. Berlin has always been a city of contradictions: from imperial glamour to proletarian slums, from the Roaring Twenties to Hitler's seizure of power. Emerging from the ruins of WWI Berlin became both the capital of Socialism and the display window of the Free World. After the fall of the wall, Berlin is still looking for its role in the center of a reshaped Europe. Readings and discussions encompass fine arts and literature from the 18th century to the present, including film. Taught in English. Cross-listed with HUMA 324. Not offered this academic year. Instructor(s): Steiner.

**GERM 325 GERMAN NOBEL PRIZE LAUREATES (3)**

Mapping German Culture. The course will introduce the biography of Alfred Nobel and the reasons for establishing his famous Nobel Prize in his will of 1895. Most famous among German recipients were Thomas Mann (1929), Hermann Hesse (1946), Heinrich Boll (1972), and Gunter Grass (1999). Their novel work will be analyzed as an artistic reflection of their socio-critical thoughts on the history of Germany. Taught in English. Cross-listed with HUMA 325. Limited enrollment. Not offered this academic year.

**GERM 326 THE GERMAN FAIRY TALE: OLD AND NEW (3)**

Mapping German Culture. Discussion of several prototypes from the fairy-tale collection of the Brothers Grimm and the subsequent development of the "literary" fairy tale from Goethe and the Romantics to the 20th century. Taught in English. Cross-listed with HUMA 372. Limited enrollment. Offered Fall. Instructor(s): Weissenberger.

**GERM 327 GERMAN EXPRESSIONISM IN EUROPEAN CONTEXT: HISTORY, LITERATURE AND FINE ARTS (3)**

Mapping German Culture. The literature, fine arts and film of German Expressionism represent the most concentrated breakthrough of modernity. In addition to focusing on this accomplishment in its European context, the course will also discuss Nietzsche's influence, the movement's ambivalent reaction to WWI and its misappropriation by communism and national-socialism. Course taught in English. Offered Spring. Instructor(s): Weissenberger.

**GERM 328 GERMAN ADAPTATIONS: TEXT TO FILM (3)**

Mapping German Culture. Prominent novels of the 20th century will be studied for their possibilities or impossibilities of rendition from print medium to cinematic medium. From the myriad of adaptations we will concentrate on Thomas Mann: *Tod in Venedig*; Franz Kafka: *Das Schloss*; Klaus Mann: *Mephisto*; Gunter Grass: *Die Blechtrommel*; H. Boll: *Katharina Blum*; Jurek Becker: *Jacob der Lugner*. All films are subtitled in English. Course taught in English with a possible FLAC section. Cross-listed with HUMA 328. Limited enrollment. Not offered this academic year.

**GERM 329 LITERATURE OF THE HOLOCAUST AND EXILE (3)**

Mapping German Culture. Most of the authors from Germany and Austria, who were persecuted and fled into exile, used literature to search for meaning in life that apparently had been stripped of all meaning. Among these authors are the most distinguished writers of the time, i.e., Th. and H. Mann, Brecht, Benjamin, Werfel, Doblin, J. Roth, S. Zweig, N. Sachs, Celan, Auslander. Taught in English. Cross-listed with HUMA 329. Limited enrollment. Offered Fall. Instructor(s): Weissenberger.

**GERM 330 COURTSHIP, LOVE AND MARRIAGE IN THE AGE OF CHIVALRY (3)**

Mapping German Culture. The literature of the High Middle Ages is the first since antiquity to probe the hazards and potentials of romance between men and women, as well as single-sex friendship and love. This course will show how the literary ideal of love emerged in a society that was torn apart by war and rivalry. The poems and stories we will read belong to the treasures of medieval literature from the German lands. Taught in English. Cross-listed with HUMA 330, MDST 335, SWGS 330. Limited enrollment. Offered Fall. Instructor(s): Westphal.

**GERM 331 SOCIETY AND CRISIS: POLITICAL CULTURE IN THE WEIMAR REPUBLIC (3)**

Mapping German Culture. Born in political and social crisis, the Weimar Republic exemplifies the possibilities and limits of modern democracy. This seminar focuses on original documents of political thought, literature, the visual arts, society, and law to explore the political culture of Germany's first, ill-fated democracy. Taught in English. Cross-listed with HIST 431. Limited enrollment. Not offered this academic year. Instructor(s): Emden; Caldwell.

**GERM 332 TOPICS IN MODERN GERMAN HISTORY (3)**

Mapping German Culture. Seminar on selected topics in the history of modern Germany. Taught in English. Cross-listed with HIST 459. Limited enrollment. Offered Spring. Instructor(s): Caldwell.

**GERM 333 NIETZSCHE: PHILOSOPHY, POLITICS, HISTORY (3)**

Mapping German Culture. Situates Nietzsche's thought on language, history, and the body within its historical context, and examines the validity of his arguments in a world increasingly challenged by scientific knowledge. Focuses on Nietzsche's views on truth, genealogy, nihilism, morality, and science, which continue to be relevant for current debates within the humanities. Taught in English. Limited enrollment. Offered Spring. Instructor(s): Emden.

**GERM 334 NATION AND MEMORY (3)**

Mapping German Culture. Providing a critical review of modern concepts of nationhood and nationalism in the light of recent research on cultural memory, this course traces the history of political foundation myths in Germany and Europe since the eighteenth century. The course provides links between literature, visual culture, historical anthropology, and public policy. Taught in English. Limited enrollment. Not offered this academic year. Instructor(s): Emden.

**GERM 335 AMERICANIZATION AND ANTI-AMERICANISM (3)**

Mapping German Culture. Discussion about globalization, American hegemony, and the aftermath of September 11 has increased debates in the German-speaking countries regarding the export and acceptance of American culture and values. In this course, we will examine the German/Austrian encounter with American culture since 1945 and discuss relevant readings from the arts, history, and politics. Taught in English. Not offered this academic year. Instructor(s): Kecht.

**GERM 338 NEW GERMAN CINEMA (3)**

Mapping German Culture. From the 1960 to 2000, Germany has developed a very distinct auteur cinema with independent filmmakers such as Fassbinder, Herzog, Wenders, Adlon, Trotta, Sander, Brueckner, Doerrle, Garnier, Tykwer, and others. The first 20 years of German film were oriented on coming to terms with the fascist past; the second 20 years focused on more contemporary issues. Film critical readings and class discussion in English. All films are subtitled in English and will be assessed with podium technology. Taught in English. Cross-listed with HUMA 373, SWGS 361. Limited enrollment. Not offered this academic year.

**GERM 340 WALTER BENJAMIN: AESTHETICS, HISTORY AND POLITICS (3)**

Mapping German Culture. Benjamin has been celebrated as a revolutionary Marxist, a theologian of Jewish Messianism, and as an essayist and literary critic. The course offers an introduction to his writings by way situating them in the historical background of the Weimar Republic and the crises of European society on the eve of WWII. Taught in English. Cross-listed with HUMA 340. Not offered this academic year. Instructor(s): Steiner.

**GERM 343 MOTHERS AND DAUGHTERS IN FILM AND LITERATURE (3)**

Mapping German Culture. In the literary and cinematographic representation of mother-daughter relations one can trace cultural constructions of gender and social dynamics. We will examine a variety of topically relevant 20th and 21st century texts and films from the German-speaking countries as we discuss images of family, relationships, and identity. Offered Fall. Instructor(s): Kecht.

**GERM 344 GERMAN HISTORY, 1648-1890 (3)**

Survey of "Germanies" from the rise of absolutist state following the Thirty Years' War to the unification of Germany in 1871. Includes the development of the bureaucratic and military institutions of the modern state, changing conceptions of state and society, and the major social and economic changes of the period. Taught in English. Cross-listed with HIST 354. Offered Fall. Instructor(s): Caldwell.

**GERM 345 FROM DEMOCRACY TO DICTATORSHIP: GERMAN HISTORY, 1890-1945 (3)**

From 1890-1945, Germans experienced dramatic changes in their political environment. This lecture class will examine these changes, taking into account not only political history, but also attempts to come to terms with the challenges posed by organized capitalism, the rise and fall of socialism, the development of an interventionist state, cultural critique, and political culture, the Nazi social revolution, and the Holocaust. Taught in English. Cross-listed with HIST 355. Offered Spring. Instructor(s): Caldwell.

**GERM 351 INTELLECTUALS, ARTISTS, AND THE STATE (3)**

Focus on the multiple relationships 20th century artists/intellectuals have displayed towards the German/Austrian state in which they have lived and worked. Do artists/intellectuals carry public responsibility? Are artists/intellectuals supposed to act as a "public conscience"? Is art always political? Taught in German. Recommended prerequisite(s): Intermediate to high proficiency (speaking and writing); successful completion of GERM 303 (or equivalent). Not offered this academic year. Instructor(s): Kecht.

**GERM 352 GERMAN PLAY PRODUCTION (3)**

Students will apply/improve their German in preparation for a public play production; become familiar with literary and socio-historical context of the play; assume responsibility for various aspects of the production; demonstrate their performing abilities. Choice of a modern playwright from any of the German-speaking countries. All readings, assignments, and discussions in German. Recommended prerequisite(s): A minimum proficiency of intermediate-mid in speaking and writing; satisfactory completion of GERM 202 or equivalent; or permission of the instructor. Not offered this academic year. Instructor(s): Kecht.

**GERM 353 LITERATURE AND DEATH (3)**

The understanding of death and dying, and the culture of mourning, have undergone radical changes since the 17th century. This seminar will examine these changes from the perspective of literary anthropology in German literature and thought from the early modern to the postmodern period. Taught in German. Recommended: Prerequisite(s): Successful completion of German 303, or 304 or equivalent. Not offered this academic year. Instructor(s): Emden.

**GERM 355 CURRENT AFFAIRS IN THE MEDIA OF D, A, CH (3)**

This course focuses on the consistent advancement of German language proficiency by engaging with a variety of digitized materials (print, audio, visual) on the topic of current affairs in Germany, Austria, and Switzerland. Through systematic input students' receptive skills will be enhanced, and through classroom discussions and regular writing assignments active language production will be promoted. Intermediate-high proficiency or above is the outcome goal. Pre-requisite(s): GERM 303 or GERM 304. Not offered this academic year. Instructor(s): Kecht.

**GERM 401 FALL- INDEPENDENT WORK IN GERMAN LITERATURE (1 TO 3)**

Qualified students work on projects of their choice under the supervision of individual instructors with approval of the undergraduate advisor. Department permission required. Repeatable for Credit. Offered Fall.

**GERM 402 SPRING- INDEPENDENT WORK IN GERMAN LITERATURE (1 TO 3)**

Qualified students work on projects of their choice under the supervision of individual instructors with approval of the undergraduate advisor. Department permission required. Repeatable for Credit. Offered Spring.

**GERM 403 FALL HONORS THESIS (3 TO 6)**

Independent research projects by outstanding German majors leading to a substantial honors essay, undertaken in close cooperation with a departmental faculty member. Department permission required. Offered Fall.

**GERM 404 SPRING HONORS THESIS (3 TO 6)**

Independent research projects by outstanding German majors leading to a substantial honors essay, undertaken in close cooperation with a departmental faculty member. Department permission required. Offered Spring.

**GERM 409 TOPICS IN GERMANIC LITERATURE TO 1700 (3)**

Changing topics including the history of the Germanic languages in literary contexts; culture of medieval and early modern court and city; Viking epics; books and the Book (the Bible). Offered Summer. Instructor(s): Westphal.

**GERM 410 ADVANCED COMPOSITION AND CONVERSATION: LANGUAGE STYLE IN CULTURAL TEXTS (3)**

This course will work with sophisticated text to enable students to bring their proficiency in the various modalities of German to the advanced level. Offered Fall. Instructor(s): Steiner.

**GERM 411 ENLIGHTENMENT TO ROMANTICISM (1700-1850) (3)**

An introduction to the major social, political and cultural developments in the period between 1700-1850, which contributed to the emergence of modern German cultural identity within the European context. Covers wide range of theoretical and literary works by Kant, Lessing, Schiller, Goethe, Eichendorff, Hoffmann, Heine, and others. Taught in German. Offered Fall. Instructor(s): Emden.

**GERM 412 GERMAN REALISM TO MODERNISM (1850-PRESENT) (3)**

German history and culture during the late 19th and the 20th century have been rather turbulent: From Wilhelminian empire to Weimar democracy to Hitler fascism to socialist division to German reunification to entry into the European Union. All these political changes will be commented on by cultural reflections in textual and filmic forms. Literary texts will include Fontane, Mann, Kafka, Boll, Grass, Wolf and Maron. Taught in German. Limited enrollment. Offered Spring. Instructor(s): Kecht.

**GERM 425 VIENNA AND ITS PEOPLE (SPECIAL TOPICS SEMINAR) (3)**

In this course, we will look at the people of Vienna from the turn of the century to the present. Our readings, film viewings and discussions will introduce us to the Viennese as people of all classes and ethnic and national groups. Taught in German. Recommended prerequisite(s): Intermediate high proficiency (speaking and writing); successful completion of GERM 303 (or equivalent). Not offered this academic year. Instructor(s): Kecht.

**GREE (GREEK)****School of Humanities/Classical Studies****GREE 101 INTRODUCTION TO ANCIENT GREEK I (3)**

Introduction to ancient Greek, with emphasis on acquisition of reading skills. Offered Fall. Instructor(s): Mackie.

**GREE 102 ELEMENTARY GREEK II (3)**

Continuation of GREE 101. Offered Spring. Instructor(s): Widzisz.

**GREE 201 INTERMEDIATE GREEK I: PROSE (3)**

Review of forms and syntax. Readings from Plato. Offered Fall. Instructor(s): Yunis.

**GREE 202 INTERMEDIATE GREEK II: POETRY (3)**

Readings from Homer or Attic tragedy. Offered Spring. Instructor(s): Widzisz.

**GREE 301 ADVANCED GREEK (3)**

Further reading of ancient Greek texts with emphasis on the linguistic development of ancient Greek. Not offered this academic year.

**GREE 491 DIRECTED READING (3)**

Independent work for qualified juniors and seniors in genres or authors not presented in other courses. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Fall.

**GREE 492 DIRECTED READING (3)**

Independent work for qualified juniors and seniors in genres or authors not presented in other courses. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Spring.

**HART (HISTORY OF ART)****School of Humanities/Art History****HART 101 INTRODUCTION TO THE HISTORY OF WESTERN ART I: ANTIQUITY TO GOTHIC (3)**

A survey of painting, sculpture, and architecture from Antiquity to the 15th century. Cross-listed with MDST 111. Offered Fall. Instructor(s): Neagley; Quenemoen.

**HART 102 INTRODUCTION TO THE HISTORY OF WESTERN ART II: RENAISSANCE TO PRESENT (3)**

A survey of painting, sculpture, and architecture from the Renaissance through the 20th century. Offered Spring. Instructor(s): Costello; Manca.

**HART 103 INTRODUCTION TO THE HISTORY OF ASIAN ART (3)**

Survey of Asian art from the Neolithic period to the present.

**HART 104 CASE STUDIES IN ANCIENT AND MEDIEVAL ARCHITECTURE (3)**

This course offers an introduction to the history of Western art and architecture through weekly case studies of some of the most important public and private buildings in antiquity and the Middle Ages: from the Parthenon to a Roman house, Caernarvon Castle to Chartres Cathedral. Topics explored throughout the course include the construction of imperial authority, ritual and the formation of space, and the relationship between structure and design. Cross-listed with ARCH 104, MDST 104. Instructor(s): Neagley; Quenemoen.

**HART 105 KEY MONUMENTS AND ARTISTS OF WESTERN ART (3)**

An in-depth look at important moments in the history of European and American art, from the Renaissance to the 20th century. Rather than being a comprehensive survey, the course will focus on a limited number of works by leading artists in the fields of painting, sculpture, and architecture. Instructor(s): Manca.

**HART 128 INTRODUCTION TO AFRICAN ART HISTORY (3)**

This is an introductory course on African art from the 15th to 20th centuries, ranging from a study of archaeological objects to sculpture and masks from the colonial period and beyond. The course will meet at the Menil Collection: numbering close to 1000 objects, the de Menils' collection includes a range of masks and sculptures from West and Central Africa that allow for a first hand introduction to various cultures on the continent. Offered Spring. Instructor(s): Van Dyke.

**HART 207 FOURTEEN ARTWORKS AT THE MFAH (3)**

This course is designed to provide students with no previous background in art history with an introduction to the discipline through the "in situ" study of 14 works from the permanent collection of The Museum of Fine Arts, Houston. Some of the topics to be addressed include British aristocratic portraiture, French Impressionist painting, the aesthetic dialogues of Matisse and Picasso, the abstracted sculptures of Brancusi and Calder, and the site-specific installation of Turrell's light tunnel. Limited enrollment. Instructor(s): Brennan.

**HART 208 SPECIAL TOPICS IN MUSEUM STUDIES (1 TO 3)**

Special topics and new courses, not necessarily to be repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 209 INDEPENDENT STUDY IN MUSEUM STUDIES (1 TO 3)**

Independent study, reading, or special research in art history at the introductory level. Instructor permission required. Repeatable for Credit.

**HART 210 CASE STUDIES IN ROMAN ART (3)**

This course offers students with little or no background an introduction to Roman art through weekly case studies of some of the most important public and private works. Subjects to be addressed include patronage, visuality, narrative, and style within the changing contexts of republic and empire. Cross-listed with CLAS 214. Limited enrollment. Offered Fall. Instructor(s): Quenemoen.

**HART 215 ROME: CITY AND EMPIRE (3)**

An introduction to the history and topography of Rome from its origins to its collapse in Western Europe ca. 500 AD. Emphasis on the development of the city of Rome as the center of an evolving empire, seen through its monuments, buildings, art, and literature. Cross-listed with HIST 262. Not offered this academic year. Instructor(s): Quenemoen; Maas.

**HART 219 INDEPENDENT STUDY: ANCIENT ART (1 TO 4)**

Special topics, independent study, and new courses in ancient art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit. Instructor(s): Quenemoen.

**HART 220 ISTANBUL: LIFE OF AN IMPERIAL CITY (3)**

An introduction to the Ottoman capital and its monuments (15th century - 19th century). Major themes include the Byzantine legacy; imperial patronage; expressions of dynastic legitimacy, power and religion; ceremonial and imperial canon; the European influence; city's representations; leisure and public life. Limited enrollment. Offered Fall. Instructor(s): Hamadeh.

**HART 228 SPECIAL TOPICS IN CHRISTIAN, BYZANTINE AND ISLAMIC ART (1 TO 6)**

Special topics, independent study, and new courses in early Christian, Byzantine, and Islamic art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 229 INDEPENDENT STUDY IN CHRISTIAN, BYZANTINE, AND ISLAMIC ART (1 TO 6)**

Special topics, independent study, and new courses in early Christian, Byzantine, and Islamic art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 238 SPECIAL TOPICS IN MEDIEVAL ART (1 TO 6)**

Special topics, independent study, and new courses in Medieval art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit. Instructor(s): Neagley.

**HART 239 INDEPENDENT STUDY IN MEDIEVAL ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit. Instructor(s): Neagley.

**HART 240 ART IN CONTEXT: LATE MEDIEVAL AND RENAISSANCE CULTURE (3)**

This course will be concerned with the art, architecture, and history of the late Middle Ages and Renaissance. We will employ historical texts, literature, and illustrations of works of art, showing how historical documents and sources can illuminate the cultural context of art and architecture. Cross-listed with HUMA 108, MDST 108. Instructor(s): Neagley; Manca.

**HART 248 SPECIAL TOPICS IN RENAISSANCE AND BAROQUE ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 249 INDEPENDENT STUDY IN RENAISSANCE AND BAROQUE ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 258 SPECIAL TOPICS IN 19TH AND 20TH CENTURY ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 259 INDEPENDENT STUDY IN 19TH AND 20TH CENTURY ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 268 SPECIAL TOPICS IN AMERICAN ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 269 INDEPENDENT STUDY IN AMERICAN ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 278 SPECIAL TOPICS IN NON-WESTERN ART (1 TO 6)**

Special topics and new courses in non-Western art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 279 INDEPENDENT STUDY IN NON-WESTERN ART (1 TO 6)**

Independent study, reading, or special research in non-Western art. Instructor permission required. Repeatable for Credit.

**HART 285 INTRODUCTION TO FILM: FILM CRITICISM (4)**

This writing-intensive course will teach students to view films analytically and write film criticism. Each week, students will view a film, read some criticism of that film, and write their own view of the film. Screenings will be taken from important movements in world cinema history. Special emphasis on influential relationships between criticism and film styles. Cross-listed with ENGL 275. Repeatable for Credit. Limited enrollment. Instructor(s): Ostherr.

**HART 286 CLASSICAL AND CONTEMPORARY FILM THEORY (3)**

This course introduces the student to approaches to understanding and interpreting film as film. It traces the attempts to grasp the new medium in theoretical terms from its origins to the present day. Topics include: montage, mise-en-scene, the gaze, history, psychoanalysis, and feminism. Cross-listed with ENGL 286. Limited enrollment. Instructor(s): Dove.

**HART 288 SPECIAL TOPICS IN FILM AND MEDIA STUDIES (1 TO 6)**

Special topics and new course in film and media studies, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 289 INDEPENDENT STUDY IN FILM AND MEDIA STUDIES (1 TO 6)**

Independent study, reading, or special research in film and media studies. Instructor permission required. Repeatable for Credit.

**HART 298 SPECIAL TOPICS IN ART THEORY AND CRITICISM (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 299 INDEPENDENT STUDY IN ART THEORY AND CRITICISM (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 300 MUSEUM INTERN PROGRAM I (1 TO 6)**

The aim of this course is to provide select students a practicum in museum work accompanied by an introduction to a history of museums, including the varieties of museums, their role in society and significant issues in museums today. Instructor permission required. Instructor(s): Manca.

**HART 301 MUSEUM INTERN PROGRAM II (1 TO 6)**

The aim of this course is to provide select students a practicum in museum work accompanied by an introduction to a history of museums, including the varieties of museums, their role in society and significant issues in museums today. Instructor permission required. Instructor(s): Manca.

**HART 311 ART AND ARCHAEOLOGY OF THE ANCIENT NEAR EAST (3)**

An in-depth examination of the art and archaeology of ancient Mesopotamia, Syria, Anatolia and Persia. Beginning in The Neolithic period, we will examine the development of Near Eastern art and architecture through the study of ancient sites and their associated material culture. Cross-listed with ANTH 331.

**HART 312 GREEK ART AND ARCHITECTURE (3)**

This course will present the art and architecture of Greece, Asia Minor, and Southern Italy (Magna Graecia) from the Bronze Age through the Hellenistic period (ca 2000-30 B.C.). It will consider development of the classical orders in architecture, innovations with painting and sculpture, and the cultural and political significance of art in ancient Greek society. Cross-listed with GLAS 312. Instructor(s): Quenemoen.

**HART 315 ROMAN ART AND ARCHITECTURE (3)**

A chronological survey of Roman sculpture, painting, and architecture from its Etruscan beginnings to the late Empire. Art and architecture of Rome and the provinces considered within their larger social, political, and urban contexts. Particular attention given to patronage, the relation between Roman and Greek art, and Rome's position as an artistic center. Cross-listed with CLAS 315. Instructor(s): Quenemoen.

**HART 318 SPECIAL TOPICS IN ANCIENT ART (3)**

Two week course in Rome that introduces major monuments of the city. Focuses on both the history and function of these monuments in antiquity and explores how their meaning has evolved in the post-classical world. Cross-listed with CLAS 321. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Quenemoen, McGill.

**HART 320 THE AGE OF AUGUSTUS (3)**

This course will consider the period in Roman history between 31 BC and 14 AD, when the emperor Augustus restored stability to the Roman world, oversaw the expansion of the empire, and rebuilt Rome as a capital city. The Age of Augustus witnessed an unparalleled flowering in the literary arts and a revolution in art and architecture whose legacy persists to this day. We will examine in detail the political events and cultural life of this vital time, paying particular attention to the continuity between the late Republic and the Augustan period, Augustus' construction of his public identity, imperial and non-imperial patronage in poetry and the visual arts, and the role of literature, art, and architecture in the formation of Augustan ideology in Rome and in the provinces. The course offers a thorough picture of one of the most significant, yet in some ways most elusive, periods in history. Cross-listed with CLAS 320. Instructor(s): Quenemoen.

**HART 321 VISUAL CULTURE OF THE ISLAMIC WORLD I (3)**

An introduction to the arts of architecture of the Islamic world from the rise of Islam to the Mongol invasions. Explores the development of a visual tradition through its continuities, regional variations, exchanges, and inter-textualities. Examines key religious and secular institutions and art forms through their aesthetic and historical contexts. Cross-listed with ARCH 331. Instructor(s): Hamadeh.

**HART 322 VISUAL CULTURE OF THE ISLAMIC WORLD II (3)**

An introduction to the architecture, ceramics, textiles, and arts of the book of the Islamic world, from Egypt to India and Central Asia, beginning in the wake of the Mongol conquests and ending with the demise of the Ottoman empire. Focusing on court patronage and production, the course examines key buildings and objects through their aesthetic, cultural, religious, and political contexts. Methodological concerns of the field are addressed through an exploration of such themes as iconoclasm, word and image, and cross-cultural influences. Cross-listed with ARCH 332. Instructor(s): Hamadeh.

**HART 323 TEN MONUMENTS OF THE ISLAMIC WORLD (3)**

This seminar examines ten key religious and secular buildings of the Islamic world, including some of the most celebrated monuments such as the Taj Mahal, in India, and the Alhambra Palace, in Spain. It covers a wide geographical area that stretches from modern Turkey, Egypt, and Syria, to Iran and India. Each session will alternate lecture and discussion and will focus on one building, exploring it in depth in relation to its aesthetic, cultural, religious, and political contexts. We will examine the formation of a visual vocabulary, its continuities and variations, the complex layers of meanings embedded in these monuments, and will consider questions of patronage, imperial ideology, and cross-cultural encounters and influences. Cross-listed with ARCH 328. Instructor(s): Hamadeh.

**HART 325 WHAT IS ISLAMIC ART ? (3)**

This seminar is a critical examination of key themes and issues in Islamic art. Based on readings that focus on specific examples of artistic and architectural production of major landmarks from the 7th to the 18th centuries our discussions will evolve around such questions as: What is Islamic about Islamic art? How and where did art, religion, and politics intersect? To what extent were art and architecture informed by religious principles, practices, and rituals? Can we speak of a distinctive visual language across the Muslim world? We will also explore the role of myth in the construction of cultural heritage, the development of writing the art form of calligraphy, and questions of patronage and imperial ideology. We will revisit long-held assumptions about the nature of Islamic art as iconoclastic and aniconic, and about the nature and aspect of artistic exchange between the Muslim world and the Latin Christian West, Byzantium, and China. Cross-listed with ARCH 325. Instructor(s): Hamadeh.

**HART 327 ART AND EMPIRE: THE OTTOMAN WORLD (3)**

This course looks at the art and architecture of the Ottoman empire, the longest surviving Muslim empire, from its inception in 1453 until its demise in the 1920s. Based on in-depth studies of religious and secular monuments, objects, and paintings, it examines the roots of Ottoman visual culture, the formation of a canon style, relations with eastern and western artistic traditions, issues of power and identity in art, systems of patronage, concepts of westernization and Ottoman modernism. Limited enrollment. Offered Fall. Instructor(s): Hamdeh.

**HART 330 EARLY MEDIEVAL ART (3)**

Early Medieval Art from the 5th Century to the Romanesque period. This course begins with a study of the art and architecture of the Ostrogoths, Visigoths, Lombards, Celts, Anglo-Saxons, Franks, and Merovingians, and the transformation of the Roman World through new Germanic, Barbarian, and Christian forces. The second part of the course considers the cultural Renaissance of the Carolingian and Ottonian Periods under rulers such as Charlemagne and Otto III. The last third of the course focuses on themes of pilgrimage, relics, crusades and the emergence of new monumental tradition in art and architecture during the Romanesque Period. Cross-listed with MDST 330. Offered Fall. Instructor(s): Neagley.



**HART 331 GOTHIC ART AND ARCHITECTURE IN NORTHERN EUROPE, 1140-1300: THE AGE OF CATHEDRALS (3)**

Examination of the full array of sacred art and architecture produced in the early and high gothic periods in northern Europe. Includes cathedral architecture, sculpture, stained glass, manuscripts, and metalwork studies in relationship to the expansion of royal and Episcopal power. Cross-listed with MDST 331. Instructor(s): Neagley.

**HART 332 LATE GOTHIC ART AND ARCHITECTURE IN NORTHERN EUROPE, 1300-1500 (3)**

Examination of art and architecture produced in the late gothic period within three distinct settings--the court, the city, and the church. Includes private, public, and religious life as expressed in the objects, architecture, and decoration of the castle and palace, the house, the city hall and hospital, and the chapel and parish church. Cross-listed with MDST 332. Instructor(s): Neagley.

**HART 340 NORTHERN RENAISSANCE ART (3)**

Study of art in northern Europe from Jan van Eyck to Peter Bruegel. Instructor(s): Manca.

**HART 341 EARLY RENAISSANCE ART IN ITALY (3)**

Study of Italian art and architecture from Giotto to Botticelli, with emphasis on painting and sculpture in the 15th century. Instructor(s): Manca.

**HART 342 THE HIGH RENAISSANCE AND MANNERISM IN ITALY (3)**

Study of the High Renaissance, with emphasis on its leading masters (e.g., Leonardo, Raphael, Bramante, Michelangelo, and Titian). Includes a study of mannerism, the stylish art produced after the first quarter of the 16th century. Instructor(s): Manca.

**HART 343 MASTERS OF THE BAROQUE ERA (3)**

Study of the works of the greatest painters and sculptors in Europe during the Baroque period. Includes Rembrandt, Rubens, Caravaggio, Poussin, Claude, and Velazquez. Instructor(s): Manca.

**HART 345 ARCHITECTURE AND THE CITY I (3)**

This course provides a chronological survey of European architecture, urbanism, and landscape design from the Renaissance to the nineteenth century. Through focused attention to selected buildings, plans, designs, and theories, the course considers key works and their relationships to differing aesthetic, cultural, and political contexts. Cross-listed with ARCH 345.

**HART 350 FASCISM, TOTALITARIANISM AND RETURNS TO ORDER (3)**

This introductory seminar will examine the response by artists, architects, critics, and filmmakers to fascism, proto-fascism, and totalitarianism in Europe from 1905 to 1945. Particular attention will be paid to the differing ways in which authoritarianism becomes manifest in the specific cultural and historical conditions of France, Germany, Italy, the Soviet Union, and Spain, and the ways in which anti-modernist artistic production in turn responds to this specificity. Offered Fall. Instructor(s): Hughes.

**HART 351 NINETEENTH CENTURY ART IN EUROPE (3)**

Exploration of the major developments in painting and sculpture from late 18th century neoclassicism and romanticism through realism, impressionism, and post-impressionism. Include architecture, photography, and decorative arts.

**HART 352 TWENTIETH CENTURY ART IN EUROPE (3)**

Exploration of major developments in painting and sculpture from the 1880s to the 1940s. Includes impressionism and post-impressionism, expressionism, cubism, abstraction. Dada, and surrealism, with a brief consideration of architecture and photography.

**HART 353 ART AND ARCHITECTURE IN THE AGE OF REVOLUTIONS (1725-1875) (3)**

This course will consider the key artistic and architectural movements and styles in Europe from Rocco to Impressionism. We will also look at major theoretical development in those years in art, architecture, and city planning. Finally, we will take into account momentous political developments, especially revolution, and the threat of revolution, which affected and were in turn affected by, cultural production. Limited enrollment. Instructor(s): Costello.

**HART 354 AGE OF ROMANTICISM IN EUROPE (3)**

This course will consider the emergence and flourishing of Romanticism in the visual arts in Europe. We will consider artists from France, Germany and Britain, including Eugene Delacroix, J.M.W. Turner, John Constable and Caspar David Friedrich. We will combine study of paintings with readings of contemporaneous philosophers and writers, including Hegel and Byron. Limited enrollment. Offered Fall. Instructor(s): Costello.

**HART 356 ART IN THE VANGUARD: VISUAL CULTURE AND RADICAL POLITICS, 1800-2005 (3)**

This seminar will consider the relationship between visual culture, history and radical politics, looking closely at art as a means of political and ideological resistance and persuasion. Ranging from the 19th to the 21st century, we will consider various strategies of creating politically radical art, looking at the work of Daumier, Courbet, John Heartfield and others. We will also look at the impact of Marxism on art historians, critics and philosophers, including Benjamin, Adorno and Althusser. Finally, we will examine divergent governmental views of art, including the Nazi conception of "Degenerate Art", the fate of modern art in the Soviet Union and the influence of anti-communism on the visual culture of the United States. Limited enrollment. Offered Spring. Instructor(s): Costello.

**HART 357 CONSTABLE AND TURNER (3)**

This seminar will explore critical issues surrounding the careers of John Constable and J.M.W. Turner, arguably the greatest landscape painters of the early 19th century. We will look at both similarities and differences in the work of these two rivals, while considering their work in the context of great historical change in England. Offered Fall. Instructor(s): Costello.

**HART 358 IMPRESSIONISM AND POST-IMPRESSIONISM (3)**

This class will explore painting in France from approximately 1865 to 1900. Mixing lectures and classroom discussion, we will focus on individual artists including Claude Monet, Edgar Degas, Mary Cassatt, Georges Seurat, Vincent van Gogh, and Paul Cezanne. We will also consider and discuss a set of critical issues surrounding these painters, including the politics of gender and class within the changing urban setting of Paris. Offered Fall. Instructor(s): Costello.

**HART 359 ISSUES IN EARLY MODERNISM: FAUVISM TO EXPRESSIONISM (3)**

This course will explore painting, sculpture, and architecture in Europe, 1900-1925. We will consider mainstream European formalist modernism in movements like Fauvism and Cubism, considering critical issues around masters including Matisse, Picasso and Mondrian, as well as the continuing figurative tradition in the work of artists like Kirchner and Beckmann. Limited enrollment. Instructor(s): Costello.

**HART 360 AMERICAN ARCHITECTURE AND DECORATIVE ARTS BEFORE 1900 (3)**

Major topics will include the furniture styles of early America, the architecture of colonial cities, the life, thought, and architectural ideas of Thomas Jefferson, urban design and building projects in Washington, D.C., and other U.S. cities, and domestic life and interior design in 19th century America. Instructor(s): Manca.

**HART 362 LATE MODERN ART: 1945 - PRESENT (3)**

This course introduces the major developments, key figures and significant works of late Modernism. Covering a period from roughly 1945-Present, we will trace modernism's unfolding in the avant-garde practices of the 2nd half of the 20th century. Beginning with the shift from Paris to New York as the cultural center of the avant-garde, the rise of Abstract Expressionism & its divided legacies. Limited enrollment. Instructor(s): Hughes.

**HART 364 STUDIES IN AMERICAN ART FROM THE COLONIAL ERA TO THE ARMORY SHOW (3)**

This course will examine a range of topics in U.S. art from the colonial era to circa 1910. Some themes to be addressed include representations of landscapes and their relation to American culture nationalism; social realism vs. modernist abstract images; and representations of gendered subjectivity in American visual culture. Limited enrollment. Instructor(s): Brennan.

**HART 365 GENDER, SUBJECTIVITY, AND THE HISTORY OF PHOTOGRAPHY (3)**

This course will examine a range of subjects within the history, theory, and criticism of photography, including the relationship between commodification, eroticism, and the objectification of the body; and the intersecting issues of mechanical reproduction, authorship, and authenticity in modern and postmodern discourses. Cross-listed with SWGS 365. Limited enrollment. Instructor(s): Brennan.

**HART 366 STUDIES IN AMERICAN ART FROM THE 1920S TO THE 1960S (3)**

This course will examine a range of topics in American and European art from the 1920s to the 1960s. Our subjects will include the machine aesthetic, cultural nationalism, social realist and regionalist practice, the New York School, and Pop art. Intense methodological reading will accompany visual analysis. Limited enrollment. Instructor(s): Brennan.

**HART 367 STUDIES IN MODERN ART FROM THE 1960S TO THE PRESENT (3)**

This course will examine a range of topics in American and European art from the 1960s to the present. Our subjects will include Pop art, body and performance art, deconstruction, postmodernism, minimalism, and art in the digital age. Limited enrollment. Instructor(s): Brennan.

**HART 368 SUBJECTIVITY IN MODERN/POSTMODERN ART (3)**

Subjects of Desire: Subjectivity in Modern and Postmodern Art and Thought. This course examines the intellectual history of subjectivity and its various representations in modernist and postmodernist aesthetics. In particular, we will consider the intersection of subjectivity and desire by examining the ongoing project of human self-creation through aesthetics, ornament, framing devices, technological apparatuses, and other supplementary objects of desire. Cross-listed with SWGS 348. Limited enrollment. Instructor(s): Brennan.

**HART 369 SEMINAR ON BEAUTY AND FRAGMENTATION IN MODERN ART (3)**

This course will examine literal and symbolic representations of the human body in modern American and European art. Topics addressed will include conceptions of beauty versus subjective fragmentation; the performative nature of social identity; and art history's longstanding preoccupation with the sensuous equivalency of flesh and paint. Cross-listed with SWGS 369. Graduate/Undergraduate version: HART 569. Limited enrollment. Instructor(s): Brennan.

**HART 371 CHINESE PAINTING (3)**

This course examines Chinese painting from ancient times to the early twentieth century. Issues of examination include themes, styles, and functions of Chinese painting; the interrelationship between paintings and the intended viewers; regionalism; images and words; foreign elements in Chinese painting. Cross-listed with ASIA 371. Offered Spring. Instructor(s): Huang.

**HART 372 CHINESE ART AND VISUAL CULTURE (3)**

In this course, we will study how various artistic styles developed in historical, social and cultural contexts from the ancient period to the present day. Through the careful examination of architecture, calligraphy, painting, sculpture, ceramics, bronze, and film, students will gain a deeper understanding of Chinese art and visual culture. Cross-listed with ASIA 372. Offered Fall. Instructor(s): Huang.

**HART 373 METHODOLOGY SEMINAR: WORD AND IMAGE (3)**

Art history is the craft of putting images into words. This course explores the question of how words and images intersect in the visual arts. Readings of some key texts on the subject will be followed by a series of case studies concerning specific artistic genres and issues. Topics include: narrative in painting; the frame and the caption; character and face in portraiture; the word as image in calligraphy; and sound and image in film. Through its readings and cases, the course will provide students a focused introduction to art historical theories and methods. Not offered this academic year.

**HART 374 ART & RELIGION IN CHINA (3)**

This introductory course examines the complex relationship between art and religion in China (4th - 19th centuries). Through an analysis of painting, sculpture, cave temples, steles, manuscripts, talismans, illustrated prints, and primary sources, we will explore the visual, religious and cultural dimensions of Buddhism and Daoism, and the fluid nature of Chinese culture. Cross-listed with ASIA 374, RELI 374. Instructor(s): Huang.

**HART 375 LATIN AMERICAN ART: INDEPENDENCE TO THE PRESENT (3)**

This course studies the work of leading visual artists working in Latin America during the 19th and 20th centuries. The range and diversity of Latin American art will be emphasized and work in a variety of media will be explored, including mural painting, easel painting, architecture, prints, sculpture, photography, film, installations, and conceptual art. The work will be discussed in terms of contextual historical, political, social, and cultural developments. Not offered this academic year.

**HART 380 SURVEY OF AMERICAN FILM AND CULTURE (3)**

This course will cover the history of cinema in the U.S. from its origins to the present day. We will examine the development of narrative, the transition to synchronized sound, the classical Hollywood form and style (with detailed analysis of cinematography, editing, mise-en-scene, sound), the rise and fall of the Production Code, film genres and the star system, the emergence of television, the influence of postwar "art cinemas," the origins of the blockbuster, and the status of Hollywood as "global cinema." The relationship between film and culture will be explored through the economics of filmmaking, the role of regulatory institutions, and the controversies surrounding the notorious Birth of a Nation, McCarthyism and the Blacklist, and representations of sex and violence on film. Cross-listed with ENGL 373. Instructor(s): Ostherr.

**HART 381 GRAPHING, COUNTING, FILMING: REPRESENTATION IN SCIENCE AND ANTHROPOLOGY (3)**

Cinema originated in the inscription of physiology on film; this was quickly followed by biology and ethnology done by cinematography. This course examines the historical, critical and methodological relations between film as a medium or method of visual investigation and cinema as a site of cultural analysis. Cross-listed with ANTH 318. Instructor(s): Landecker.

**HART 382 MODALITIES OF CINEMA (3)**

In this course, we will survey the range of organizing principles in cinema - the differing and combative ways cinema arranges its images and sounds. We will look at classicism, modernism, postmodernism and many other modes. The films will range from early silent pictures, to experimental shorts, to commercial blockbusters. Limited enrollment. Instructor(s): Dove.

**HART 383 GLOBAL CINEMA (4)**

This course introduces students to cinema as a global enterprise. It explores the relationship between nations, identities, races, concepts, and genres. It inquires into the question of globalization as it relates to the motion picture audience, corporations, and the commerce of ideas. Cross-listed with ENGL 385. Instructor permission required. Instructor(s): Dove.

**HART 385 MAPPING GERMAN CULTURE: EUROPEAN WOMEN FILMMAKERS (3)**

Filmmaking has celebrated its first hundred years. Women's contributions were significant and deserve to widen the film canon for all filmgoers. This course will concentrate on films by European women directors, taking into account historical pioneering, cultural identities, aesthetics particularities, gender commitment, subject orientations and post-feminist attempts. Importance will also be given to the contexts and conditions of women's film production. All films subtitled in English. Taught in English with possible FLAC section. Cross-listed with GERM 321, HUMA 321, SWGS 358.

**HART 387 GLOBAL MEDIA STUDIES (3 OR 4)**  
Examines the relationship between globalization and mass-mediated images and sounds. Looks at global distribution of Hollywood entertainment from early twentieth century onward; reception of Hollywood cinema and television in different national contexts; production of alternative/oppositional film and television by indigenous populations. Case studies of Hollywood, Bollywood, and Hong Kong. Repeatable for Credit. Instructor(s): Ostherr.

**HART 390 THEORETICAL PERSPECTIVES ON THE VISUAL ARTS (3)**  
Exploration of overlapping themes central in the history of art, using texts from Plato to post-modernism. Includes the use of biography, style, connoisseurship, quality, the social basis of art, theories of change in the arts, psychology, iconography, and the modernist canon and post-modern challenges to that canon, as well as race, gender, class, authorship, and audience.

**HART 391 PRODUCING FEMINIST KNOWLEDGE: METHODOLOGY AND VISUAL CULTURE (3)**  
In this course, we will examine various methodologies used by feminist scholars in the Social Sciences and the Humanities. Particular attention will be devoted to the practical application of feminist methodologies in visual culture and the history of art, as well as to interdisciplinary feminist inquiries in science, ethnography, and epistemology. Cross-listed with SWGS 391. Limited enrollment. Instructor(s): Brennan; Shehabuddin.

**HART 392 CONCEPTUAL ART AND ARCHITECTURE (3)**  
The first part of the course will examine the conceptual art practices that began in the 1960s, including Bochner, Kosuth, art and language, LeWitt, Hacke, Kelly, and Smithson. The second part of the course will focus on the question of what constitutes a conceptual architecture by interrogating a series of potential practices including: Super Studio, Anchiram, Eisenman, Libesking, Shinohara, Hejduf, Tschumi, and others. Cross-listed with ARCH 384. Course equivalency: HART 492. Instructor(s): Last.

**HART 393 AESTHETICS AND HERMENEUTICS (3)**  
Sacred texts and the visual arts have contributed immeasurably to shaping individual and collective conceptions of the spiritual in modern and postmodern culture. This course will examine a range of aesthetic and hermeneutic traditions, including mystical texts, modernists' artworks and related museum exhibitions, in order to consider the ways in which the experiences of reading, writing, and viewing can serve as powerful acts of self-creation. Cross-listed with RELI 362. Limited enrollment. Offered Spring. Instructor(s): Brennan; Kripal.

**HART 395 SPECIAL PROBLEMS IN ART HISTORY (1 TO 6)**  
Special topics in art history. Independent study, reading, or special research in art history. Repeatable for Credit.

**HART 396 REPRESENTATION, HEALING, AND THE BODY (3)**  
In this course, we will examine literal and symbolic representations of the human body in order to explore the relations between the visuality of medicine, corporeality, subjectivity, and healing. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Brennan.

**HART 400 BAYOU BEND INTERNSHIP I (3)**  
Internship at Bayou Bend, the American Decorative Arts Center of the Museum of Fine Arts, Houston. Must be a Jameson Fellowship recipient to enroll. Instructor(s): Manca.

**HART 401 BAYOU BEND INTERNSHIP II (3)**  
Internship at Bayou Bend and The American Decorative Arts Center of the Museum of Fine Arts, Houston. Must be a Jameson Fellowship recipient to enroll. Instructor(s): Manca.

**HART 402 HONORS THESIS (3)**  
Honors thesis project in art history. Students must receive permission of the department faculty prior to enrolling. For additional information, please see Honors Program in the Rice University General Announcements. Instructor permission required. Offered Fall.

**HART 403 HONORS THESIS (3)**  
Honors thesis project in art history. Students must receive permission of the department faculty prior to enrolling. For additional information, please see Honors Program in the Rice University General Announcements. Instructor permission required. Offered Spring.

**HART 408 SPECIAL TOPICS IN MUSEUM STUDIES (1 TO 6)**  
Special topics and new courses in art history, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 409 INDEPENDENT STUDY IN MUSEUM STUDIES (1 TO 6)**  
Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 415 ART AND EMPIRE: ATHENS & ROME (3)**  
Seminar that examines the art and architecture of two of antiquity's greatest empires: Athens and Rome. Issues to be addressed include the formation of these cities as imperial capitals, the representation of the conquered, and the roles of Pericles and Augustus in forming imperial ideology. Offered Spring. Instructor(s): Quenemoen.

**HART 416 THE QUEST FOR ORIGINALITY IN CLASSICAL ART (3)**

Seminar examines how modern interests in originality and related desires for original artworks have shaped classical art history. Course considers differences between ancient and modern notions of originality; the degenerative view of Roman art based on the copying of Greek originals; how the modern quest to reconstruct lost originals has impacted the way we see antiquity today. Cross-listed with CLAS 416. Instructor(s): Quenemoen.

**HART 417 BURIED CITIES: THE ART AND ARCHITECTURE OF AKROTIRI, POMPEII, AND HERCULANEUM (3)**

An examination of classical antiquity's best preserved cities thanks to volcanic eruptions: the Bronze Age site of Akrotiri and the Roman towns of Pompeii and Herculaneum. Art and architecture will be examined within their larger social and urban contexts. Methodological and ethical issues surrounding the excavation and preservation of these sites will also be considered. Instructor(s): Quenemoen.

**HART 418 SPECIAL TOPICS IN ANCIENT ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 419 INDEPENDENT STUDY IN ANCIENT ART (1 TO 6)**

Independent study, reading, or special work in ancient art history. Instructor permission required. Repeatable for Credit.

**HART 420 ARTISTIC ENCOUNTERS: EUROPE AND THE ISLAMIC WORLD IN THE EARLY MODERN AND MODERN PERIODS (3)**

This seminar aims to assess the mutual impact of the visual cultures of Europe and the Islamic world through history. Focusing on 15th-19th-century material including architecture, painting, photography, textiles, and sartorial fashion, it examines channels of interaction, forms of influence, and modes of representation in aesthetic, cultural, philosophical, and political terms, and in light of concurrent theoretical debates. Limited enrollment. Instructor(s): Hamadeh.

**HART 422 THE MAKING OF THE ORIENT (3)**

The Making of the Orient in 18th-20th century Europe focuses on the construction of the image of the Orient in the age of European colonial expansion. Through critical analysis of texts, images, and cultural practices (painting, photography, architecture, city planning, music, fiction, and travel literature) and key theoretical works, this course examines issues of production and codification of knowledge, politics of representation, and identity construction in and beyond the colonial period. Cross-listed with ARCH 422. Limited enrollment. Instructor(s): Hamadeh.

**HART 428 SPECIAL TOPICS IN EARLY CHRISTIAN, BYZANTINE, AND ISLAMIC ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 429 INDEPENDENT STUDY IN EARLY CHRISTIAN, BYZANTINE, AND ISLAMIC ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 430 THE GOTHIC PORTAL (3)**

Seminar on the form and meaning of sculptural programs attached to French gothic cathedrals such as Chartres, Reims, and Amiens. Includes issues of iconography, style, and production, as well as more recent concerns of narrative, reception, and audience, all within the context of Medieval church doctrine and political and social life. Cross-listed with MDST 430. Instructor(s): Neagley.

**HART 431 ARCHITECTURE OF THE GOTHIC CATHEDRAL FROM THE MIDDLE AGES TO THE TWENTIETH CENTURY (3)**

This course will focus on one of the most important contributions to the history of western architecture--the Gothic cathedral. The course will approach the material from a number of different perspectives--the formal and technical development of Gothic architecture; the Medieval architect and the design of Gothic buildings, the social, economic, and political history of "big church" building in the Middle Ages; Gothic architecture as experience and metaphor; and the afterlife of the Gothic cathedral from Vasari to the National Cathedral in Washington, D.C. Cross-listed with MDST 431. Instructor(s): Neagley.

**HART 438 SPECIAL TOPICS IN MEDIEVAL ART (1 TO 6)**

Independent study, reading, or special research in Medieval art history. Instructor permission required. Repeatable for Credit.

**HART 439 INDEPENDENT STUDY: MEDIEVAL ART (1 TO 6)**

Independent study, reading, or special research in Medieval art. Cross-listed with MDST 439. Instructor permission required. Repeatable for Credit.

**HART 440 JAN VAN EYCK: PROBLEMS OF INTERPRETATION (3)**

Seminar and in-depth research on the art and historiography of the early Netherlandish painter Jan van Eyck. Cross-listed with MDST 440. Instructor(s): Neagley.

**HART 441 BOSCH AND BRUEGEL: A SEMINAR ON THE REPRESENTATION OF THE SACRED AND PROFANE (3)**

The obscene, the grotesque, the humorous, and the bizarre were frequently depicted alongside sacred religious scenes, in the margins of Medieval manuscripts, beneath the seats of church canons, or in the periphery of Gothic cathedral facade sculpture. This fantastic world, along with the personifications of the Seven Deadly Sins, was often imagined as the "other" in representations of race, class, and gender. By the sixteenth century, these images had migrated into the center of paintings, especially in the work of Hieronymus Bosch and Pieter Bruegel the Elder. This course will examine the juxtapositions and complex meanings of sacred and profane imagery within the context of late Medieval and post reformation religious and social life. Cross-listed with MDST 451. Instructor(s): Neagley.

**HART 444 LEONARDO AND MICHELANGELO (3)**

This course will offer a look at two of the greatest and most influential artists of all time. Students in this seminar will study the paintings, drawings, sculpture, and architecture of Leonardo and Michelangelo, as well as the philosophical and religious ideas found in their notebooks, letters, poetry, and other writings. There are no prerequisites for the course. Instructor(s): Manca.

**HART 448 SPECIAL TOPICS IN RENAISSANCE AND BAROQUE ART (1 TO 6)**

Special topics and new courses in Renaissance and Baroque art, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 449 INDEPENDENT STUDY IN RENAISSANCE AND BAROQUE ART (1 TO 6)**

Independent study, reading, or special research in Renaissance and Baroque art. Instructor permission required. Repeatable for Credit.

**HART 451 MODELS OF ABSTRACTION (3)**

This course will examine a range of different models of abstract painting and sculpture as they appear throughout the twentieth century. Looking closely at the historical contexts that gave rise to abstraction particular attention will be paid to how apparently similar forms of abstraction can denote very different kinds of meaning. Pre-requisite(s): HART 351.

**HART 452 MANET(S) AND MODERNISM(S) (3)**

This seminar considers the pivotal figure of Edouard Manet. Combining a study of paintings from throughout his career, with close readings of primary sources, we will assess the key aspects of his style and subject matter. We will also consider art historical to his work and relationship to modernity. Limited enrollment. Instructor(s): Costello.

**HART 453 CUBISM AND THE PROBLEM OF FORM (3)**

This seminar will examine the cultural, social, and artistic context that led to the development of Cubism. Particular attention will be paid to the problem of form and color in the period from 1907 to 1914, as well as the reception of Cubism during the post-world war I "return to order". In addition to the work of Pablo Picasso and Georges Braque, the work of the so-called "Salon Cubists" will be examined (Albert Gleizes, Jean Metzinger, Andre Lhote, Henri Le Fauconnier, et al.) along with the work of Henri Matisse, Fernand Leger, Marcel Duchamp, Robert Delaunay, Le Corbusier and Amadee Ozenfant. Limited enrollment. Offered Fall.

**HART 455 ARCHITECTURE AND SOCIETY I: EUROPEAN ARCHITECTURE AND ARCHITECTURAL THEORY (3)**

This seminar examines European architecture and architectural theory from Alberti to Semper. Through the detailed consideration of a number of key buildings and theoretical texts, it investigates relationships between theory, design, and themes such as origins, orders, proportion, structure, sensation, character, type, style, and surface. Cross-listed with ARCH 485.

**HART 458 SPECIAL TOPICS IN 19TH AND 20TH CENTURY ART (1 TO 6)**

Special topics and new courses in 19th and 20th century art. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 459 INDEPENDENT STUDY IN 19TH AND 20TH CENTURY ART (1 TO 6)**

Independent study, reading, or special research in modern Art History. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 468 SPECIAL TOPICS IN AMERICAN ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit. Instructor(s): Brennan.

**HART 469 INDEPENDENT STUDY IN AMERICAN ART (1 TO 6)**

Independent study, reading, or special research in American art. Instructor permission required. Repeatable for Credit. Instructor(s): Brennan.

**HART 478 SPECIAL TOPICS IN NON-WESTERN ART (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 479 INDEPENDENT STUDY IN NON-WESTERN ART (1 TO 6)**

Independent study, reading, or special research in non-Western art. Instructor permission required. Repeatable for Credit.

**HART 483 SEMINAR ON DOCUMENTARY AND ETHNOGRAPHIC FILM (4)**

Overview of the history of documentary and ethnographic cinema from a worldwide perspective. Includes both canonical and alternative films and film movements with emphasis on the shifting and overlapping boundaries of fiction and nonfiction genres. Cross-listed with ANTH 483. Limited enrollment.

**HART 485 GENDER AND HOLLYWOOD CINEMA IN THE 1950S (3)**

This course examines representations of gendered subjectivity in Hollywood cinema during the 1950s. Some of the topics to be addressed include the uneasy relationship between normative domesticity and heterosexual masculinity, issues of voyeurism, and eroticism, and the ongoing conflict between liberated individualism and social conformity in corporate culture and bourgeois society. Cross-listed with SWGS 485. Limited enrollment. Instructor(s): Brennan.

**HART 486 STUDIES IN FILM (3)**

Topics will vary from year to year. Cross-listed with ENGL 489. Limited enrollment. Instructor(s): Ostherr.

**HART 488 SPECIAL TOPICS IN FILM AND MEDIA STUDIES (1 TO 6)**

Special topics and new courses in film and media studies, not necessarily repeated. May be used in awarding transfer credit. Instructor permission required. Repeatable for Credit.

**HART 489 INDEPENDENT STUDY IN FILM AND MEDIA STUDIES (1 TO 6)**

Independent study, reading, or special research in film and media studies. Instructor permission required. Repeatable for Credit.

**HART 492 CONCEPTUAL ART AND ARCHITECTURE (3)**

The first part of the course will examine the conceptual art practices that began in the 1960s, including Bochner, Kosuth, art and language, LeWitt, Haacke, Kelly, and Smithson. The second part of the course will focus on the question of what constitutes a conceptual architecture by interrogating a series of potential practices including: Super Studio, Anchigram, Eisenman, Libeskind, Shinohara, Hejduf, Tschumi, and others. Course equivalency: HART 392.

**HART 498 SPECIAL TOPICS IN ART THEORY AND CRITICISM (1 TO 6)**

Independent study, reading, or special research in art history. Instructor permission required. Repeatable for Credit.

**HART 499 INDEPENDENT STUDY IN ART THEORY AND CRITICISM (1 TO 6)**

Independent study, reading, or special research in art history, theory, themes, and criticism. Instructor permission required. Repeatable for Credit.

**HART 500 INTERNSHIP PROGRAM I (1 TO 15)**

Graduate level course that will provide select students a practicum in museum work accompanied by an introduction to a history of museums, including varieties of museums, their role in society, and significant issues in museums today. Instructor permission required. Not offered this academic year.

**HART 501 INTERNSHIP PROGRAM II (1 TO 6)**

Graduate level course that will provide select students a practicum in museum work accompanied by an introduction to a history of museums, including the varieties of museums, their role in society, and significant issues in museums today. Instructor permission required. Not offered this academic year.

**HART 506 ARCHITECTURE AND THE CITY II (ENLIGHTENMENT THROUGH POSTMODERNITY) (3)**

Cross-listed with ARCH 646. Not offered this academic year.

**HART 569 SEMINAR ON BEAUTY AND FRAGMENTATION IN MODERN ART (3)**

Graduate/Undergraduate version: HART 369. Limited enrollment. Instructor(s): Brennan.

**HART 689 INDEPENDENT STUDY IN FILM AND MEDIA STUDIES (1 TO 15)**

Independent study, reading, or special research in film & media studies on the graduate level. Repeatable for Credit.

**HEAL (HEALTH SCIENCES)****School of Humanities/Kinesiology****HEAL 103 NUTRITION (3)**

Concepts underlying the science of nutrition: food composition, calories and needs for energy, special nutrients, and nutritional deficiencies. Limited enrollment. Offered Fall & Spring. Instructor(s): Anding.

**HEAL 119 INTRODUCTION TO HEALTH AND WELLNESS (3)**

Designed to help students develop a greater understanding and appreciation of health and well being, as it relates to themselves and others around them, and for students to apply health and wellness knowledge in their personal life to improve their health. Limited enrollment. Offered Fall. Instructor(s): Page.

**HEAL 132 MEDICAL TERMINOLOGY (1)**

This course introduces the student interested in medical and health professions to a large vocabulary of medical language, which develops skills in understanding and remembering new words. It describes word origins, basic terms in anatomy and terms pertaining to each body system as well as pharmacology and medical equipment, and many frequently used medical terms, abbreviations and symbols. Offered Spring. Instructor(s): Bordelon.

**HEAL 201 URBAN AND ENVIRONMENTAL SYSTEMS (4)**

The chemical, physical, and biological components of the environment as natural resources and the effects of pollution on their maintenance and utilization. Cross-listed with CEVE 201. Offered Fall. Instructor(s): Ward.

**HEAL 206 FIRST AID/EMERGENCY CARE CPR (1)**

American Red Cross certification program for emergency care procedures for illness, traumatic injuries, and cardiopulmonary resuscitation. Advanced permission of department required. Cross-listed with KINE 206. Limited enrollment. Offered Spring. Instructor(s): Harwood.

**HEAL 208 CHEMICAL ALTERATIONS OF BEHAVIOR (3)**

Examination of social, cultural psychological, physiological causes and effects of drug use and abuse. Individual, family, and community factors related to prevention and treatment will be addressed.

**HEAL 212 CONSUMER HEALTH AND THE MEDIA (3)**

Study of factual information and guidelines that enable consumers to act intelligently in selecting health products and services, with emphasis on the economic aspects of health. Offered Spring. Instructor(s): Iammarino.

**HEAL 222 PRINCIPLES OF PUBLIC AND COMMUNITY HEALTH (3)**

Principles of Public & Community Health examines aspects of the community that relate to health including health issues within community subgroups; identification and analysis of community health programs; organizational patterns and functions of voluntary and governmental health agencies and coordination of community health programs. Offered Fall. Instructor(s): Berg.

**HEAL 306 HUMAN SEXUALITY (3)**

Designed to explore the physiological, psychological, and sociological parameters of human sexuality, while providing accurate information and helping students develop healthy attitudes toward sexuality. Cross-listed with SWGS 306. Offered Spring. Instructor(s): Berg.

**HEAL 308 EMT: BASIC INTRODUCTION TO EMERGENCY CARE I (3)**

Emergency medical technician course designed to develop the knowledge and skills necessary to recognize the symptoms of various illnesses and injuries as well as the competency in the appropriate treatment for these conditions in the appropriate treatment for these conditions in the pre-hospital environment. Limited enrollment. Offered Spring. Instructor(s): Sunday.

**HEAL 310 EMT INTERMEDIATE: INTRODUCTION TO EMERGENCY CARE II (3)**

Designed to expand upon the EMT basic introductory course. Limited enrollment. Offered Fall. Instructor(s): Sunday.

**HEAL 313 FOUNDATIONS OF HEALTH PROMOTION AND EDUCATION (3)**

Foundations of Health Promotion/Health Education are designed to introduce students to the discipline of health education and the practice of health promotion. The course explores critical issues in the field of health promotion, accountability and professional preparation, professional ethics, credentialing and the changing technology in the field. Recommended for Health Science majors only. Offered Fall. Instructor(s): Iammarino.

**HEAL 350 UNDERSTANDING CANCER (3)**

Examination of cancer from a biological, psychological and sociological perspective with emphasis on cancer epidemiology, prevention, and early detection. Not offered this academic year.

**HEAL 360 VIOLENCE IN AMERICA: A PUBLIC HEALTH PERSPECTIVE (3)**

This course presents an overview of issues concerning violence using a public health perspective. Information will be presented and discussed concerning several domains pertinent to violence, including family violence, intimate partner violence, community violence, and workplace harassment. Not offered this academic year.

**HEAL 379 INTERNSHIP IN HEALTH SCIENCES (1 TO 3)**

Internship experience for upper-level health sciences majors only. Offered Fall & Spring. Instructor(s): Iammarino.

**HEAL 407 EPIDEMIOLOGY (3)**

Study of communicable, non-communicable, and behavioral diseases with emphasis on the disease process and basic epidemiologic methods. Must be in one of the following Classification(s): Junior, Senior. Limited enrollment. Offered Fall. Instructor(s): Iammarino.



**HEAL 410 PROGRAM DEVELOPMENT IN HEALTH EDUCATION (3)**

Content and methods in teaching health education; program materials and curriculum construction in secondary school health education programs. Required for Teaching Certification in Health. Not offered this academic year. Instructor(s): Iammarino.

**HEAL 422 THEORIES AND MODELS OF HEALTH BEHAVIOR (3)**

Theories & Models of Health Behavior is designed for the student interested in public and community health or health psychology. This course examines the current theories and models of health behavior and their application to the field of health promotion/education. Open only to junior and senior students. Pre-requisite(s): HEAL 222. Offered Spring. Instructor(s): Berg.

**HEAL 460 PLANNING AND EVALUATION OF HEALTH PROMOTION AND EDUCATION (3)**

Planning & Evaluation of Health Promotion provides the student with the technical skills for planning and evaluation of health promotion, health education, and disease prevention programs including collection and analysis of both qualitative and quantitative data. Offered Fall. Instructor(s): Berg.

**HEAL 485 SEMINAR ON INTERNATIONAL HEALTH PROBLEMS (3)**

This upper level seminar on International Health is designed to increase student's awareness of the multiple dimensions and complexities involved in understanding the health of people from diverse geographic, political, economic, and cultural backgrounds. The seminar will explore issues and concepts of delivery and acceptance of health care, traditional health belief customs and practices, policy, epidemiology and public health problems, demographic and environmental characteristics among selected worldwide populations. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Iammarino.

**HEAL 495 INDEPENDENT STUDIES (1 TO 3)**

Independent study or directed reading on an approved project under faculty supervision. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Fall. Instructor(s): Iammarino.

**HEAL 496 INDEPENDENT STUDY (1 TO 3)**

Independent study or directed reading on an approved project under faculty supervision. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Spring. Instructor(s): Iammarino.

**HEAL 498 SPECIAL TOPICS (1 TO 3)**

Topics vary from semester to semester. Repeatable for Credit. Offered Fall & Spring.

**HEAL 499 TEACHING PRACTICUM IN HEALTH SCIENCES (1 TO 3)**

Advanced teaching experience for upper level students who have demonstrated particular aptitude and interest in one area of kinesiology. Students will assist in conducting a course in which they have previously excelled. The student will learn techniques in course management, instruction, and evaluation. Department permission required. Recommended prerequisite(s): Junior or senior standing, declared major in Health Sciences, and at least an "A-" in the course serving as the practicum. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Iammarino.

**HEBR (HEBREW)****School of Humanities/Center for Study of Languages****HEBR 101 INTRODUCTION TO MODERN HEBREW LANGUAGE AND CULTURE I (5)**

Proficiency based course that employs a variety of instructional techniques including audio-visual materials and Internet based exercises in order to facilitate all communicative skills: listening-comprehension, speaking, reading and writing. Aspects of Israeli culture will be introduced. Recommended prerequisite(s): No prior knowledge of Hebrew. Offered Fall. URL: lang.rice.edu/tbaron.

**HEBR 102 INTRODUCTION TO MODERN HEBREW LANGUAGE & CULTURE II (5)**

Proficiency based course that employs a variety of instructional techniques including multimedia and Internet based exercises in order to enhance communicative skills. Emphasis will be put on students' presentations skills (written and verbal). Aspects of Israeli culture will be introduced. Pre-requisite(s): HEBR 101 or permission of instructor. Offered Spring. URL: lang.rice.edu/tbaron.

**HEBR 125 INTRODUCTION TO BIBLICAL HEBREW I (3)**

An introduction to Biblical Hebrew (two semesters) with emphasis on grammar and vocabulary. Offered Fall.

**HEBR 201 INTERMEDIATE MODERN HEBREW LANGUAGE AND CULTURE I (4)**

This course will continue to build up students' proficiency in understanding, speaking, reading and writing by using traditional methods of instruction and multimedia. Students will interact with authentic material from Israeli culture such as feature films. Emphasis will be put on self-expression in the language. Prerequisite(s): HEBR 102 or permission of instructor. URL: lang.rice.edu/tbaron.

**HEBR 202 INTERMEDIATE MODERN HEBREW LANGUAGE AND CULTURE II (4)**

It will to build up students' proficiency in understanding, speaking, reading and writing by using traditional methods of instruction and multimedia as well. Students will interact with authentic material from Israeli culture such as feature films. Emphasis will be put on self-expression in the language. Pre-requisite(s): HEBR 201 or permission of instructor. URL: [lang.rice.edu/tbaron](http://lang.rice.edu/tbaron).

**HEBR 398 INDEPENDENT STUDIES (3)**

Repeatable for Credit.

**HIND (HINDI)****School of Humanities/Center for Study of Languages****HIND 101 ELEMENTARY HINDI I (5)**

An in-depth introduction to modern Hindi. In an intellectually challenging environment, through a combination of graded texts, written assignments, audio-visual material and computer-based exercises, this course provides cultural insights and increases proficiency in understanding, speaking, reading and writing Hindi. Emphasis on spontaneous self-expression in the language. No prior background in Hindi assumed. Recommended prerequisite(s): No prior knowledge of Hindi assumed. Limited enrollment. URL: [www.ruf.rice.edu/~gshah/elem.html](http://www.ruf.rice.edu/~gshah/elem.html).

**HIND 102 ELEMENTARY HINDI II (5)**

In an intellectually challenging environment, through a combination of graded texts, written assignments, audio-visual material including contemporary Hindi films and songs, and computer based assignments, this course increases proficiency in understanding, speaking, reading, and writing Hindi. Emphasis is placed on spontaneous self-expression in the language. Pre-requisite(s): HIND 101 or permission of instructor. Limited enrollment. URL: [www.ruf.rice.edu/~gshah/elem.html](http://www.ruf.rice.edu/~gshah/elem.html).

**HIND 201 INTERMEDIATE HINDI (5)**

Through extensive use of cultural documents including films, radio broadcasts, and graded literary and non-literary texts, this course builds students' proficiency in Hindi. Provides space for meaningful interaction with authentic materials and their related cultures. Furthers the student's appreciation of cultural nuances. Emphasis is placed on spontaneous self-expression in Hindi. Pre-requisite(s): HIND 102 or permission of instructor. URL: [www.ruf.rice.edu/~gshah/inter.html](http://www.ruf.rice.edu/~gshah/inter.html).

**HIND 202 INTERMEDIATE/ADVANCED HINDI (5)**

Through use of cultural documents including films, radio broadcasts, and newspaper articles, this course builds students' proficiency in Hindi. Introduction of Hindi Literary traditions, provides space for meaningful interaction with authentic materials and furthers the student's appreciation of cultural nuances. Prepares students for further academic and nonacademic use of Hindi. Pre-requisite(s): HIND 201 or permission of instructor. Limited enrollment. URL: [www.ruf.rice.edu/~gshah/inter.html](http://www.ruf.rice.edu/~gshah/inter.html).

**HIND 335 SOUTH ASIAN LITERATURE, POETRY, AND POPULAR CULTURE I (3)**

Focus will vary each year depending on both, the needs and interests of the students in the class, as well as contemporary issues. Readings range from classical, to modern 20th century literature and poetry. Various art forms, including theater and film, will be thematically related to the readings. This course is taught in Hindi. Cross-listed with ASIA 331. Pre-requisite(s): HIND 202 or permission of instructor. URL: [www.ruf.rice.edu/~gshah/adv.html](http://www.ruf.rice.edu/~gshah/adv.html).

**HIND 336 SEMINAR IN SOUTH ASIAN LITERATURE, POETRY, AND POPULAR CULTURE II (3)**

HIND 336 consolidates and builds on the fifth semester Hindi course HIND 335. Continues to build student proficiency in understanding, speaking, writing and thinking in Hindi. Prepares the student for further academic and non-academic use of Hindi. Emphasis is placed on spontaneous self expression in the language. Pre-requisite(s): HIND 335 or permission of instructor. Limited enrollment. URL: [www.ruf.rice.edu/~gshah/adv.html](http://www.ruf.rice.edu/~gshah/adv.html).

**HIND 398 HINDI TEACHING PRACTICUM (1 TO 6)**

Students will work with instructor closely to acquire teaching skills in tutoring in Hindi. Instructor permission required. Repeatable for Credit.

**HIND 399 HINDI TEACHING PRACTICUM (1 TO 6)**

Students will work with instructor closely to acquire teaching skills in tutoring in Hindi. Instructor permission required. Repeatable for Credit.

**HIND 498 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Repeatable for Credit.

**HIND 499 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required.

# HIST (HISTORY)

## School of Humanities/History

### **HIST 101 MODERN EUROPE, 1450-1789 (3)**

Course provides an introduction to European history from 1500 to the French Revolution, tracing Europe's rise to world dominance via capitalism, the nation-state, science and technology, and a secular world view. It asks how conditions in the rest of the world allowed European imperialism and colonialism to triumph. Offered Fall.

### **HIST 102 MODERN EUROPE, 1789-PRESENT (3)**

Course provides an introduction to European history between the French Revolution and the collapse of the Soviet system in 1989-1990. The course examines industrialization, the development of the nation-state, World War One, Fascism and Communism, World War Two, European integration, decolonization and the Velvet Revolutions of 1989. Offered Spring. Instructor(s): Cohen; G. Daniel.

### **HIST 108 WORLD HISTORY SINCE 1492 (3)**

Class will explore the last 500 years of world history. The focus will be four long-term processes that have shaped the world today: struggles between Europeans and colonized peoples; forms of producing and exchanging goods; formation and spread of the modern state; and the development of 'bourgeois' ways of living. Offered Spring. Instructor(s): Ward.

### **HIST 117 AMERICA TO 1848 (3)**

Survey of North America from 1500 to the conclusion of the Mexican War. Offered Fall. Instructor(s): Goetz, Rebecca.

### **HIST 118 THE UNITED STATES, 1848 TO THE PRESENT (3)**

A continuation of HIST 117 (though 117 is not a prerequisite) surveying the social, political, cultural, and economic history of the United States from the end of the Mexican War to the present. Offered Spring.

### **HIST 144 FRESHMAN SEMINAR: THE ARAB-ISRAELI CONFLICT (3)**

Seminar traces the history and politics of the Arab-Israeli conflict, delving into both Palestinian and Israeli understandings of the past and present using books, documentaries, and films. The course seeks to understand how Israeli and Palestinian nationalisms have been constructed and analyzes U.S. involvement in the conflict. Cross-listed with FSEM 144. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

### **HIST 151 FRESHMAN SEMINAR: THE HERO AND HIS COMPANION FROM GILGAMESH TO SAM SPADE (3)**

How does presentation of heroic action illustrate the basic values of society? Historical sources including ancient texts, modern mystery stories, and two "western" movies, show the development of a style of community service linking heroism with alienation. The extent to which women participate will be traced. Cross-listed with FSEM 151. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Maas.

### **HIST 160 FRESHMAN SEMINAR: THOMAS JEFFERSON, THE AMERICAN REVOLUTION, AND THE USES OF THE PAST (3)**

Seminar will focus on three dimensions of Thomas Jefferson's life and legacy: first, what he said and did in the American Revolution; second, how he has been understood by historians; and third, how his words, ideas, and actions have been used by successive generations of Americans. Cross-listed with FSEM 160. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall. Instructor(s): Gruber.

### **HIST 161 FRESHMAN SEMINAR: THE USES OF THE PAST (3)**

Seminar analyzes how selected historical events are interpreted at different times and contexts. Sources include history books, novels, movies, court cases, and political debates. Specific events studied will vary according to student interest from ancient times to the present. Cross-listed with FSEM 161. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Quillen.

### **HIST 163 FRESHMAN SEMINAR: BROWN V. BOARD (3)**

A first year seminar examining the origins and legacies of the civil rights case that all but defined the parameters of modern American society and race relations. Where did the case come from? How was it argued and decided? What have been its consequences? Cross-listed with FSEM 163. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Byrd.

### **HIST 165 FRESHMAN SEMINAR: THE FRENCH REVOLUTION-HISTORIES AND LEGACIES (3)**

Freshman seminar will focus on the French Revolution and the era of Napoleon Bonaparte, 1789-1815. Lectures address three main topics: the history of the Revolution and its main actors; the diverging interpretations offered by historians; and the multiple legacies of the revolutionary period in the modern era. Cross-listed with FSEM 165. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Cohen.

**HIST 170 FRESHMAN SEMINAR: RELIGION AND VIOLENCE (3)**

Seminar explores the nexus of religion and violence as it appears in sacred traditions, as it played out historically, and as it occurs in the contemporary world. Discussions and readings include sociological, psychological, philosophical, and political approaches to religion itself, to violence in general, and particularly religious violence. Cross-listed with FSEM 170, RELI 170. Must be in one of the following Classification(s): Freshman, Sophomore. Limited enrollment. Not offered this academic year. Instructor(s): Quillen; Carroll.

**HIST 173 FRESHMAN SEMINAR: SOUTHERN REBELS (3)**

The "South" is often understood to be the most conservative region in the U.S. Seminar will use selected autobiographical texts by "southern rebels" to challenge that idea, and examine the tradition of dissent in the culture and history of the American South. Cross-listed with FSEM 173. Limited enrollment. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 176 FRESHMAN SEMINAR: TERROR AND AFRICAN AMERICAN HISTORY (3)**

From the 1880s to 1968, lynch mobs murdered nearly 5,000 African-Americans. Terror and black responses to it have shaped nearly every aspect of African American history. This seminar examines black society, politics, gender, and culture in 20th century America against the backdrop of racial violence. Cross-listed with FSEM 176. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Byrd.

**HIST 188 THE ATLANTIC WORLD: ORIGINS TO THE AGE OF REVOLUTION (3)**

Survey of social, political, economic, and intellectual ligatures, which bound the particular histories of Africa, Europe, and the Americas one to the other, till by the late 18th century the Atlantic basin, constituted a world unto itself. Course equivalency: HIST 388. Not offered this academic year. Instructor(s): Byrd.

**HIST 200 ANCIENT EMPIRES: ORIGINS OF WESTERN CIVILIZATIONS (3)**

Course explores development of imperial systems from the Bronze Age to Roman Empire with attention to subject peoples' participation in multi-ethnic states. Aspects of art, law, economics, religion, and literature of the Hittites, Assyrians, Persians, Greeks, and Romans examined with consideration given to strengths and weaknesses of contributions to the modern world. Offered Fall. Instructor(s): Maas.

**HIST 202 INTRODUCTION TO MEDIEVAL CIVILIZATION: THE EARLY MIDDLE AGES (3)**

Introduction to the European culture of the "Dark Ages," from the fall of Rome to the end of the Viking invasions. Includes the use of historical, literary, artistic, and archaeological sources to trace changes in European material, spiritual, and cultural life between 300 and 1000 AD. Cross-listed with MDST 202. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 203 INTRODUCTION TO MEDIEVAL CIVILIZATION: THE HIGH MIDDLE AGES (3)**

European culture from the year 1000 to the discovery of the Americas, which encompasses the Crusades, the "discovery of the individual", chivalry and chivalric literature, the Black Death, and the beginnings of the Age of Exploration. Cross-listed with MDST 203. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 206 INTRODUCTION TO ASIAN CIVILIZATIONS (3)**

Introduction to the great cultural traditions of Asia, past and present, with emphasis on evolving religious and philosophical traditions, artistic and literary achievements, and patterns of political, social, and economic change. Cross-listed with ASIA 211. Limited enrollment. Offered Fall. Instructor(s): Smith; Huang; Shehabuddin.

**HIST 211 AMERICAN THOUGHT AND SOCIETY, I (3)**

Survey of 17th and 18th century American history, with emphasis on intellectual and social developments underlying the surface of events. Course equivalency: HIST 311. Offered Fall. Instructor(s): Haskell.

**HIST 212 AMERICAN THOUGHT AND SOCIETY, II (3)**

Continuation of HIST 211. Survey of the 19th and early 20th century American cultural history, stressing developments underlying surface events. May take HIST 211 and HIST 212 separately. Course equivalency: HIST 312. Not offered this academic year. Instructor(s): Haskell.

**HIST 214 CARIBBEAN NATION BUILDING (3)**

Course will focus on the slow, steady process through which nation states emerged in the Caribbean from the 18th century to the present, as well as the difficulties they face amidst increasing globalization. Course equivalency: HIST 314. Not offered this academic year. Instructor(s): Cox.

**HIST 215 BLACKS IN THE AMERICAS (3)**

Comparative survey of black people in the Americas for 1619 to the present examines the Atlantic slave trade, the movement toward slave emancipation in various countries, and 19th century black self-help efforts. The course also concentrates on economic conditions for blacks at the turn of the 20th century. Course equivalency: HIST 315. Offered Spring. Instructor(s): Cox; Byrd.

**HIST 219 FORTUNE-TELLERS AND PHILOSOPHERS: THE ROLE OF DIVINATION IN CHINESE HISTORY (3)**

Course will examine the way fortune-telling beliefs and practices --use of "oracle bones", consultation of the "I-ching" (Book of Changes), physiognomy, spirit-writing, fengshui--have evolved over 3000 years in China. Focus will be how these practices have traveled to other countries; and exploring political, social and cultural significances. Course equivalency: HIST 319. Not offered this academic year. Instructor(s): Smith.

**HIST 220 CONTEMPORARY CHINA (3)**

Introductory course is designed to encourage creative ways of thinking about "Cultural China"- a broad-ranging concept that includes the People's Republic of China, the newly established Special Administrative Region (SAR) of Hong Kong, the Republic of China on Taiwan, and overseas Chinese communities throughout the world. Course equivalency: HIST 310. Not offered this academic year. Instructor(s): Smith; Lewis.

**HIST 223 EMPIRES AND COMMUNITIES IN THE MIDDLE AGES (3)**

Course will explore the political, social, and economic conceptions of the Byzantine and Holy Roman Empires. Examining the self-perceptions of the Empire; the role of Roman tradition and languages; notions of (geographical) borders and nations; different constitutions in political representation, administration, and economic organization. Cross-listed with MDST 223. Course equivalency: HIST 323. Offered Fall. Instructor(s): Haverkamp.

**HIST 225 EUROPE SINCE 1945 (3)**

Survey of the history of Europe from the end of World War II to 1989. The course focuses on the impact of the war on European societies as well as on decolonization, European unification, economic reconstruction and immigration and the rise and fall of communism in Eastern Europe. Offered Fall. Instructor(s): Cohen.

**HIST 227 COLONIAL LATIN AMERICA (3)**

Survey course of colonial Latin America focusing on construction of the self and "other" narrative strategies and rhetoric. Examination of narrative of conquest, travel and piracy in Latin America and the Caribbean in the 16th and 17th centuries. Not offered this academic year.

**HIST 228 MODERN LATIN AMERICA (3)**

Survey course examining the creation of modern Latin America. Concentrating on the struggles over land and labor, the creation of nation-states, and the conflicts within those states over issues of citizenship and social justice. The course will also address the contentious role the United States has played in the region. Limited enrollment. Not offered this academic year.

**HIST 231 AFRICA TO 1884 (3)**

Survey of the changing historiography of Africa. Includes the emergence of the Bantu; early Christianity and Islam; trans-Saharan trade; Medieval Sudanic empires; statelessness and state formation; Portugal in Africa; the slave trade; the Mfecane; the Sudanic jihads; long-distance trade; and African-European relations in the 19th century. Limited enrollment. Offered Fall. Instructor(s): Odhiambo.

**HIST 232 THE MAKING OF MODERN AFRICA (3)**

Survey of the transformation of Africa from the late 19th century to the present. Includes the partition of Africa and colonial states; economic and social changes in the 20th century; political developments; and Africa since independence. Limited enrollment. Offered Spring. Instructor(s): Odhiambo.

**HIST 233 HISTORY OF SCIENCE IN THE MODERN PERIOD (3)**

Main issues in the history of modern science from the 17th century to the present. Topics might include: the "Scientific Revolution," Newtonianism in the 18th century. Darwinism and evolution, the relativity and quantum revolutions in physics in the early 20th century; and recent developments in the life sciences like molecular biology. Offered Fall.

**HIST 235 THE WORLD AND THE WEST (3)**

Introduction to the last 500 years of world history, focusing on processes that define the modern period. Topics include industrialization, democratization, colonialism, and emergence of new forms of cultural production with exploration of how and why such processes have come to divide the modern world into "west" and a "non-west". Cross-listed with HUMA 235. Course equivalency: HIST 365. Not offered this academic year. Instructor(s): Quillen; Makdisi.

**HIST 237 NANOTECHNOLOGY: CONTENT AND CONTEXT (3)**

Nanotechnology is science and engineering resulting from manipulation of matter's most basic building blocks: atoms and molecules. Course is designed for humanities and science students desiring to explore content of nanotechnology (e.g., methods of visualization, experimentation, manufacture, and technical feasibility) with social context (issues of ethics, regulation, history, intellectual property, controversy). Cross-listed with ANTH 235, CHEM 235. Limited enrollment. Instructor(s): Kulinowski.

**HIST 241 U.S. WOMEN'S HISTORY: COLONIAL BEGINNINGS TO THE CIVIL WAR (3)**

Survey of American women's history examines the lives of elite, working, black, Indian, and white women, and traces changes in women's legal, political, and economic status from the mid-17th century through the Civil War. Topics include slavery, suffrage, sexuality, and feminism. Cross-listed with SWGS 234. Not offered this academic year. Instructor(s): Sneider.

**HIST 242 U.S. WOMEN'S HISTORY: CIVIL WAR TO THE PRESENT (3)**  
Survey of American women's history examines the lives of black, Asian American, Chicana, native American, and white women, and traces changes in women's legal, political, and economic status from the Civil War to the present. Topics include suffrage, anti-lynching, welfare, birth control, and the modern civil rights and feminist movements. Cross-listed with SWGS 235. Not offered this academic year. Instructor(s): Sneider.

**HIST 243 HISTORY WRITING SEMINAR: RELIGION IN AMERICAN LIFE, FROM THE FOUNDING TO FUNDAMENTALISM (3)**  
Intensive writing course will survey major developments in the first 150 years of the United States' religious history. Topics will include church-state debates; race and slavery; gender and religious practice; religion and warfare; science, Darwin, and natural theology; nativism and immigration; the origins of fundamentalism. Instructor(s): Harlow.

**HIST 244 WRITING HISTORY: JAPANESE AMERICANS IN WORLD WAR II (3)**  
Intensive writing course will examine the Japanese American experience of internment and military service during World War II. Using a variety of materials, including novels, oral histories, and popular media the class will investigate the relationship between public memory, museums, academic, and politics during the second half of the 20th century. Instructor(s): Salyers.

**HIST 246 CIVIL WAR AND RECONSTRUCTION (3)**  
Introduction to the American Civil War, 1861 - 1865. Topics will include the origins of sectional differences prior to the war; the effects and consequences of the war for various groups in the North and South; conflicts of the home front; and the Reconstruction era. Offered Fall.

**HIST 247 WRITING HISTORY: EUROPEAN ROMANTICISM, 1750 - 1850 (3)**  
Intensive writing course will be a comparative but chronological examination of the Romantic movements of Germany, Britain, and France from 1750 to 1850, stressing the "unity in multiplicity" of European Romanticism. Although literature will be the focus, the course will also incorporate the visual arts and music. Instructor(s): Foster.

**HIST 254 CULTURE AND SOCIETY IN POST-1945 GERMANY (3)**  
Course examines German politics and societies under Allied administration (West and East Germany 1949-1989) and the Federal Republic since 1990. Topics include democracy; post-1945 responses to Nazism; political economies; challenges of the "new social movements"; and national identity in context of European unification and global migration. Not offered this academic year. Instructor(s): Wildenthal.

**HIST 256 EUROPEAN POLITICS AND SOCIETY, 1890-1945 (3)**  
Examination of European history in the age of total war. Includes imperialism and the development of the welfare state, institutional responses to the demands of total warfare, the crisis of liberal constitutionalism, the Russian Revolution, and the rise of fascism. Not offered this academic year. Instructor(s): Caldwell.

**HIST 257 JEWS AND CHRISTIANS IN MEDIEVAL EUROPE (3)**  
Course will study relationships between Jewish and Christian communities within the context of Christian Europe. Topics will include settlement and demography; economics; legal status; hostility against Jews; family and the position of women; communal organizations; social diversity; and intellectual and spiritual achievements. Cross-listed with MDST 257. Course equivalency: HIST 357. Offered Spring. Instructor(s): Haverkamp.

**HIST 258 FOCUS EUROPE: POLICY DEBATES IN HISTORICAL PERSPECTIVE (3)**  
An introduction to the study of Europe through current policy debates on topics such as religious fundamentalism and the rights of cultural minorities; migration and immigration; and the prospects for the traditional welfare state in a global economy. Historical and cultural analysis will be brought to bear on these policy issues. Not offered this academic year. Instructor(s): Cohen; Westphal.

**HIST 262 ROME: CITY AND EMPIRE (3)**  
An introduction to the history of Rome from its origins to its collapse in western Europe ca 500 A.D. Emphasis is on the development of the city of Rome as the center of an evolving empire, seen through its monuments, buildings, art, and literature. Cross-listed with HART 215. Not offered this academic year. Instructor(s): Maas; Quenemoen.

**HIST 265 NORTH AMERICA IN THE AGE OF REVOLUTION, 1763-1789 (3)**  
An overview of the American Revolution from its beginning as a colonial protest to its transformation into a movement seeking independence from Britain. Also examines differences over the meaning and legacy of the Revolution in the new Republic, with consideration of its significance for the Atlantic World as well. Offered Spring. Instructor(s): Goetz

**HIST 268 BONDAGE IN THE MODERN WORLD (3)**  
Slavery has re-emerged as a global issue in the 21st century. This course will explore the origins of slavery, convict transportation, indentured servitude and other forms of forced migration from the 17th century onward with examination of the colonial and post-colonial contexts of the Americas, Africa, Asia and Australia. Not offered this academic year. Instructor(s): Ward.

- HIST 270 SOUTH AFRICA AND INDONESIA: EMPIRE TO NATION (3)**  
Survey examines the histories of modern South Africa and Indonesia from the earliest indigenous societies of the present. Focus on the role of the Dutch Indian Ocean Empire; South Africa under British rule; and the rise of nationalism and dramatic transitions to democracy in the 20th century. Not offered this academic year. Instructor(s): Ward.
- HIST 271 HISTORY OF SOUTH ASIA TO 1857 (3)**  
Historical survey of cultural, religious, economic and political systems of South Asia from ancient settlements in the Indus River valley, appearance of Aryan-Vedic society, development of world religious systems and global trade networks, rise of Islamic empire, British imperialism, opposition and alliance. Offered Fall.
- HIST 272 HISTORY OF SOUTH ASIA, 1857 TO PRESENT (3)**  
Study of South Asian independence, from development of political resistance to partition and its aftermath: the legacy of Ghandi and the Nehru dynasty, separatist movements in Sri Lanka and Kashmir, communism, literacy, gender, Islamic Pakistan vs. India's Saffron Wave, Bollywood and Bangalore, a nuclear South Asia. Offered Spring.
- HIST 274 JEWISH HISTORY, 1500-1948 (3)**  
History of the Jews' expulsion from Spain to the establishment of the state of Israel. Life in western and eastern Europe as well as in Islamic countries, seen from the perspective of settlement, assimilation, and the particularities of the Jewish historical experience. Course equivalency: HIST 374. Not offered this academic year. Instructor(s): Haverkamp.
- HIST 277 HISTORY OF THE OTTOMAN EMPIRE, 1453-1918 (3)**  
Course surveys the political, social, economic, and cultural history of the Ottoman Empire. Course equivalency: HIST 377. Not offered this academic year. Instructor(s): Makdisi.
- HIST 278 THE ARAB WORLD IN THE 20TH CENTURY, 1918 TO PRESENT (3)**  
Survey of the history and culture of the Arab world from World War I to the present. Topics include nationalism, colonialism, and Orientalism as understood and discussed in the contemporary Arab world through debates about Palestine, status of women, and rise of modern Islamic politics. Course equivalency: HIST 378. Offered Fall. Instructor(s): Makdisi.
- HIST 279 THE CARIBBEAN IN THE AGE OF REVOLUTION, 1770-1820 (3)**  
An examination and analysis of Caribbean societies as they sought to adjust to forces unleashed by the American and French Revolutions and amidst mounting antislavery sentiment in the western world. Course equivalency: HIST 379. Not offered this academic year. Instructor(s): Cox.
- HIST 281 THE MIDDLE EAST FROM THE PROPHET MUHAMMAD TO SULAYMAN THE MAGNIFICENT (3)**  
Introduction to the Middle East from the rise of Islam to the middle of the 16th century. Topics include conquests and classical Islamic states, Arabization, Jewish and Christian communities, impact of Turkic peoples, and the Ottoman Empire, with emphasis on social, cultural, and political trends, which shaped the region's history. Cross-listed with MDST 281. Offered Fall. Instructor(s): Sanders.
- HIST 283 WOMEN IN THE MODERN ISLAMIC WORLD (3)**  
Course introduces students to the history of women in the Islamic world. Topics include women and law, family relations, work, women as political actors in Islamic history, the harem as a social and political institution, women as property owners, veiling, and modern feminist movements throughout the Islamic world. Cross-listed with SWGS 283. Not offered this academic year. Instructor(s): Sanders.
- HIST 291 20TH CENTURY AMERICAN PRESIDENTS (3)**  
Course will study the American presidency and the evolving use of executive power from Theodore Roosevelt to Bill Clinton. It will analyze how presidents develop foreign and domestic policy, relate to congress and their cabinets, and lead the nation in wartime. Limited enrollment. Offered Fall.
- HIST 295 THE AMERICAN SOUTH (3)**  
Survey of the American South from development of Native American cultures to present. Topics include slavery and plantation economy; emergence of southern distinctiveness; Civil War and Reconstruction; political reform and the civil rights movement; rise of the Sunbelt, southern religion, music, and literature; and the future of southern regionalism. Course equivalency: HIST 395. Limited enrollment. Offered Spring. Instructor(s): Boles.
- HIST 300 INDEPENDENT STUDY (1 TO 4)**  
Independent study under the supervision of a history faculty member. Hours are variable. Department permission required. Repeatable for Credit. Offered Fall & Spring.
- HIST 302 TRADITIONAL CHINESE CULTURE (3)**  
An interpretive Introduction to the language, philosophy, religion, art, literature, and social customs of China. . An interpretive introduction to the language, philosophy, religion, art, literature, and social customs of China. Not offered this academic year. Instructor(s): Smith.

**HIST 307 IMPERIAL ROME FROM CAESAR TO DIOCLETIAN (3)**

Examination of how Rome acquired, maintained, and understood her empire. Includes the development of a political, social, and ideological system reaching from Scotland to Mesopotamia during the three centuries of Rome's greatest power. Offered Fall. Instructor(s): Maas.

**HIST 308 THE WORLD OF LATE ANTIQUITY (3)**

Study of the social, religious, and political history of the Roman world from Diocletian to the rise of Islam, with emphasis on the breaking of the unity of the Mediterranean world and the formation of Byzantine society in the Greek East. Cross-listed with MDST 308. Not offered this academic year. Instructor(s): Maas.

**HIST 309 BYZANTIUM AND THE SLAVS (3)**

This course is about the marvelous Byzantine Empire, its history and culture in relation to the Slavs. Cross-listed with SLAV 410. Limited enrollment.

**HIST 310 CONTEMPORARY CHINA (3)**

An enriched version of HIST 220. May not receive credit for both HIST 220 and 310. Course equivalency: HIST 220. Not offered this academic year. Instructor(s): Smith; Lewis.

**HIST 311 AMERICAN THOUGHT AND SOCIETY, I (3)**

Enriched version of HIST 211. Students may not receive credit for both HIST 211 and 311. Course equivalency: HIST 211. Offered Fall. Instructor(s): Haskell.

**HIST 312 AMERICAN THOUGHT AND SOCIETY, II (3)**

An enriched version of HIST 212. Students may not receive credit for both HIST 212 and 312. Course equivalency: HIST 212. Not offered this academic year. Instructor(s): Haskell.

**HIST 313 MODERN MEXICO (3)**

Lecture and discussion course examining the roots of the Mexican Revolution with the development of the coalitions of peasants, workers, and middle-class politicians that participated in the 1910-1917 revolution and the slow institutionalization that followed. Not offered this academic year.

**HIST 314 CARIBBEAN NATION BUILDING (3)**

Enriched version of HIST 214. May not receive credit for both HIST 214 and 314. Course equivalency: HIST 214. Not offered this academic year. Instructor(s): Cox.

**HIST 315 BLACKS IN THE AMERICAS (3)**

Enriched version of HIST 215. May not receive credit for both HIST 215 and 315. Course equivalency: HIST 215. Offered Spring. Instructor(s): Cox; Byrd.

**HIST 316 THE INVENTION OF PAGANISM IN THE ROMAN EMPIRE (3)**

Course examines the concept of "paganism" from the first through seventh centuries A.D. Includes examination of the mutually tolerant character of Roman religions, invention of the category, and Christian application to all polytheists of the empire and beyond. Not offered this academic year. Instructor(s): Maas; McGill.

**HIST 319 FORTUNE-TELLERS AND PHILOSOPHERS: THE ROLE OF DIVINATION IN CHINESE HISTORY (3)**

Enriched version of HIST 219. May not receive credit for both HIST 219 and 319. Course equivalency: HIST 219. Not offered this academic year. Instructor(s): Smith.

**HIST 320 IMPERIAL GARDENS: A CULTURAL COMPARATIVE (3)**

Course will examine the design and development of gardens (primarily those of the Islamic world -Al Andalus, the Middle East, Persia, Central and South Asia) and their use as political and religious metaphors, havens for meditation, stages of imperial performance and ritual, sites of social interaction, and affirmations of power and legitimacy. Offered Spring.

**HIST 323 EMPIRES AND COMMUNITIES IN THE MIDDLE AGES (3)**

Enriched version of HIST 223. May not receive credit for both HIST 223 and 323. Cross-listed with MDST 323. Course equivalency: HIST 223. Offered Fall. Instructor(s): Haverkamp.

**HIST 325 MEXICAN AMERICAN HISTORY (3)**

Lecture course will examine Mexican Americans in the context of their everyday lives to reconstruct their worldviews, values, and habits in order to evaluate their response to the changing economic, social, and political relations determined by the evolution of American capitalism. Not offered this academic year. Instructor(s): Pastrano

**HIST 326 MIGRANT LABOR IN AMERICA (3)**

Course examines the history of seasonal migratory workers since the end of the Civil War. Analyzes the transformation of the U.S. economy to study the roots of migrant labor in rural America. Not offered this academic year. Instructor(s): Pastrano.

**HIST 330 ORIGINS OF AFRO-AMERICA (3)**

Survey of major issues and events in the formation of modern Afro-America from the 15th to late 18th century. Not offered this academic year. Instructor(s): Byrd.



**HIST 331 CONSUMER CULTURE IN THE AMERICAS (3)**

Course will examine the emergence of consumer culture in the Americas (the United States and Latin America) from comparative and transnational perspectives beginning with the colonial period. Exploration between consumption and citizenship, consumer culture and gender norms, and consumer culture and the mass media. Offered Spring. Instructor(s): Serna.

**HIST 332 CHICANO ACTIVISM, 1930 - 1980 (3)**

Course examines the history of Chicano activism from 1930 to 1980. Topics include labor struggles and Mexican-American workers in the 1930's, civil rights politics in the 1940's and 1950's, student and farm-worker movement in the 1960's, and community empowerment in the 1970's. Offered Spring. Instructor(s): Pastrano

**HIST 334 AMERICAN RADICALISM AND DISSENT (3)**

Course will explore the political, cultural and intellectual history of radical social movements in the United States. Topics will include abolitionism, feminism, anarchism, socialism, communism, civil rights, black nationalism, gay rights, anti-war protest, and the 1960s New Left. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 335 CARIBBEAN HISTORY TO 1838 (3)**

Study of Caribbean history from the arrival of the Europeans to the abolition of slavery in the British West Indies in 1838, with emphasis on the social and economic history of the region. Includes the question of why slavery and the plantation system both emerged and fell. Offered Fall. Instructor(s): Cox.

**HIST 336 CARIBBEAN HISTORY 1838 TO PRESENT (3)**

Study of the social, economic, and political history of the Caribbean people from the abolition of slavery to the emergence of independent nations in the modern era. Not offered this academic year. Instructor(s): Cox.

**HIST 338 HUMANIST TRADITIONS AND ITS CRITICS (3)**

Exploration of aspects of Western humanist and anti-humanist traditions from the early modern period to the present, with emphasis on how writers within each tradition understood fundamental terms like human nature, self, community, morality, and freedom. Includes literary, theological, and philosophical texts, as well as contemporary critical theory. Not offered this academic year. Instructor(s): Quillen.

**HIST 341 PRE-MODERN CHINA (3)**

Survey of Chinese history from antiquity to c.1800, highlighting salient aspects of China's heritage. Not offered this academic year. Instructor(s): Smith.

**HIST 342 MODERN CHINA (3)**

Course focuses on China's revolutionary transformation in the 19th- and 20th centuries, from the Ch'ing dynasty to the People's Republic. Offered Spring.

**HIST 344 REFORMATION EUROPE (3)**

Survey of Western Europe in the 16th century, with emphasis on the interplay between politics and religion in the rise and consolidation of Protestantism and the Catholic revival. Offered Spring.

**HIST 345 RENAISSANCE EUROPE (3)**

Exploration of major cultural developments in Western Europe from the rise of Italian humanism in the 14th century to European conquest and expansion in the 16th century. Cross-listed with MDST 345. Offered Fall.

**HIST 347 U.S. LABOR HISTORY: 20TH CENTURY REPRESENTATIONS (3)**

Lecture/discussion course considers the last century of American labor history through a close analysis of journalism, fiction, and film. Topics will include: industrialization, immigration, gender, industrial unionism, race relations, syndicalist, socialist and communist organizing, agrarian labor, and de-industrialization. Offered Fall. Instructor(s): Pastrano, J.

**HIST 348 U.S. HISTORY: THE NEW DEAL AND W.W. II (3)**

Topics include political economy of the depression and development of a government response; growth of the labor movement; cultural and political ferment of the era; regionalism; and the wartime home experience of women, racial minorities, and the working class. Limited enrollment. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 349 WOMEN AND GENDER IN 19TH CENTURY EUROPE (3)**

Examination of the political and cultural discussions of the "woman question" in 19th century Europe. Includes the role of public and private legal rights in republicanism and the early feminist movement, gender equality in the context of socialist movements, and challenges to gender identity posed by cultural modernism. Cross-listed with SWGS 420. Not offered this academic year. Instructor(s): Wildenthal.

**HIST 350 AMERICA, 1900-1940 (3)**

Survey of major economic, social, and political developments in the United States from 1900 to 1940. Not offered this academic year. Instructor(s): Matusow.

**HIST 351 AMERICA SINCE 1945 (3)**

Survey of major economic, social and political developments in the United States since 1945. Limited enrollment. Offered Spring. Instructor(s): Matusow.

**HIST 352 HISTORY OF THE COLD WAR (3)**

Course will cover Russo-American relations from the end of World War II to the collapse of the Soviet Union in 1989 --profiling the major policymakers and world leaders and exploring not only the diplomatic and military operations but also the cultural landscape of the Cold War. Limited enrollment. Offered Fall.

**HIST 354 GERMAN HISTORY, 1648-1890 (3)**

Survey of the "Germanies" from the rise of the absolutist state following the 'Thirty Years' War to the unification of Germany in 1871. Includes development of modern bureaucratic and military institutions, changing conceptions of state and society, and the major social and economic changes of the period. Cross-listed with GERM 344. Offered Fall. Instructor(s): Caldwell.

**HIST 355 FROM DEMOCRACY TO DICTATORSHIP: GERMAN HISTORY 1890-1945 (3)**

Lecture class examines empire, democracy and dictatorship in Germany, 1890-1945. Includes political history, challenges of organized capitalism, the rise and fall of socialism, development of an interventionist state, cultural critique and political culture, the Nazi social revolution, and the Holocaust. Cross-listed with GERM 345. Offered Spring. Instructor(s): Caldwell.

**HIST 357 JEWS AND CHRISTIANS IN MEDIEVAL EUROPE (3)**

Enriched version of HIST 257. May not receive credit for both HIST 257 and 357. Cross-listed with MDST 357. Course equivalency: HIST 257. Offered Spring. Instructor(s): Haverkamp.

**HIST 358 EUROPEAN INTELLECTUAL HISTORY FROM AUGUSTINE TO DESCARTES (3)**

Course will survey key developments in Western thought (political theory, literature, philosophy, theology, and art) from the consolidation and institutionalization of Christian doctrine in the fourth and fifth centuries through the beginnings of the "Scientific Revolution" in the 17th century. Cross-listed with MDST 358. Not offered this academic year. Instructor(s): Quillen.

**HIST 359 HUMOR AND ENTERTAINMENT IN ISLAMIC SOCIETY (3)**

Course investigates humor and entertainment in Islamic societies from the early Islamic period to the 20th century. Reading and discussion of texts from the Arabic, Persian, and Turkish literary traditions, and analysis of genres and entertainment values. Cross-listed with RELI 358. Limited enrollment. Not offered this academic year. Instructor(s): Cook; Sanders.

**HIST 360 EMPIRE AND FILM (3)**

The British Empire will be explored through a wide range of films from Britain, America, India and China. These films offer a storehouse of images, styles and sentiments reflecting in many ways on "the imperial enterprise". In addition, readings. Recommended prerequisite(s): Some previous work in either history or film. Limited enrollment. Not offered this academic year. Instructor(s): Wiener.

**HIST 361 EARLY MODERN BRITAIN, 1485 - 1688 (3)**

Lecture course examines one of the most dynamic periods of British history. Topics include: the Tudor-Stuart monarchy; interaction between England, Ireland, and Scotland; Protestant Reformation and Puritanism; Shakespeare and the English Renaissance; the British Revolution; and British expansion in North America. Readings will focus on primary sources.

**HIST 362 BRITAIN FROM THE INDUSTRIAL REVOLUTION TO TONY BLAIR, 1815-PRESENT (3)**

Exploration of Britain's take-off into the Industrial Revolution, the flourishing of the Empire, and the adjustment to the end of the Empire and the diminishment of world political and economic stature from the First World War to Tony Blair's "New Britain." Includes the use of novels and films to examine these transformations. Offered Fall. Instructor(s): Wiener.

**HIST 365 THE WORLD AND THE WEST (3)**

Enriched version of HIST 235. Students may not receive credit for both HIST 235 and 365. Course equivalency: HIST 235. Not offered this academic year. Instructor(s): Quillen; Makdisi.

**HIST 367 AMERICA AND THE MIDDLE EAST (3)**

Exploration of American political, cultural, and religious involvement in the Middle East. Contents vary. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

**HIST 370 EUROPEAN INTELLECTUAL HISTORY: BACON TO HEGEL (3)**

Survey of major thinkers and intellectual movements from the scientific revolution to the French Revolution. Includes the use of primary and secondary sources to establish the main contours of philosophical, political, and cultural expression and to relate them to their historical context. Not offered this academic year. Instructor(s): Zammito.

**HIST 371 HISTORY OF MODERN FRANCE (3)**

Study of transformations in French society, culture, and politics before, during, and after the French Revolution. Taught in English. Offered Fall. Instructor(s): Cohen.

**HIST 374 JEWISH HISTORY, 1500-1948 (3)**

Enriched version of HIST 274. Students may not receive credit for both HIST 274 and 374. Course equivalency: HIST 274. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 376 NATURAL DISASTERS IN THE CARIBBEAN (3)**

Natural disasters have had a profound impact on the Caribbean. This course examines how hurricanes, earthquakes, and volcanic eruptions affected aspects of the region's economy, political system, and social structure from colonial times to the present. Also explores opportunities these disasters presented for strengthening local institutions and promoting development. Not offered this academic year. Instructor(s): Cox.

**HIST 377 HISTORY OF THE OTTOMAN EMPIRE, 1453-1918 (3)**

Enriched version of HIST 277. May not receive credit for both HIST 277 and 377. Course equivalency: HIST 277. Not offered this academic year. Instructor(s): Makdisi.

**HIST 378 THE ARAB WORLD IN THE 20TH CENTURY, 1918-PRESENT (3)**

Enriched version of HIST 278. May not receive credit for both HIST 278 and 378. Course equivalency: HIST 278. Offered Fall. Instructor(s): Makdisi.

**HIST 379 THE CARIBBEAN IN THE AGE OF REVOLUTION, 1770-1820 (3)**

An enriched version of HIST 279. Students may not receive credit for both HIST 279 and 379. Course equivalency: HIST 279. Not offered this academic year. Instructor(s): Cox.

**HIST 381 GOD, TIME AND HISTORY (3)**

How is the passage of time given meaning, and what roll -if any-is assigned to divinity in shaping the direction of events? Course explores various forms of recording and interpreting events, drawing from ancient Mesopotamia, Israel, and the Greco-Roman world -the cultures in which modern ideas of history began. Cross-listed with RELI 385. Not offered this academic year. Instructor(s): Maas; Henze.

**HIST 382 CLASSICAL ISLAMIC CULTURES (3)**

An introduction to the cultures and religions of the Islamic world from the 9th through the 14th centuries. Topics include Islamic law and theology, philosophy, ritual, Islamic science and medicine, classical Arabic literature, the impact of Arabo-Islamic culture on Jewish and Christian cultures of the Islamic world. Cross-listed with MDST 382. Not offered this academic year. Instructor(s): Sanders.

**HIST 386 RECENT U.S. FOREIGN POLICY (3)**

Course will examine American policy during the climactic years of the Cold War. Topics will include detente under Nixon and Carter, confrontation under Reagan, the "new thinking" of Gorbachev, regional conflicts, and the fall of the Soviet Union. Limited enrollment. Not offered this academic year. Instructor(s): Matusow.

**HIST 387 LIFE ON THE NILE (3)**

Egyptian society, culture, and religion from the 18th to 20th centuries. Course will use travel accounts, ethnographies, novels, historical chronicles, and movies, to examine the position of Egypt in the Ottoman and British Empires. Focus will be the long-term Egyptian cultural and social structures and their transformation in different political contexts. Offered Spring. Instructor(s): Sanders.

**HIST 388 THE ATLANTIC WORLD: ORIGINS TO THE AGE OF REVOLUTION (3)**

Enriched version of HIST 188. Students may not receive credit for both HIST 188 and 388. Course equivalency: HIST 188. Not offered this academic year. Instructor(s): Byrd.

**HIST 389 MIGRATIONS AND DIASPORAS IN THE INDIAN OCEAN WORLD (3)**

The Indian Ocean World presents an enormously varied arena of cultural exchange and interaction spanning coastal regions of Africa, the Middle East, South, and Southeast Asia and Australia. Course introduces the region by examining societies and empires shaped by voyages of exploration, religious pilgrimages, trading diasporas and forced migration. Cross-listed with ASIA 389. Not offered this academic year. Instructor(s): Ward.

**HIST 395 THE AMERICAN SOUTH (3)**

An enriched version of HIST 295. May not receive credit for both HIST 295 and 395. Course equivalency: HIST 295. Limited enrollment. Offered Spring. Instructor(s): Boles.

**HIST 398 TOPICS IN LEGAL HISTORY (3)**

Courses on selected topics in legal history. Contents vary. Cross-listed with SWGS 398. Limited enrollment. Not offered this academic year.

**HIST 403 HONORS THESIS (3)**

Restricted to students who have been admitted to the honors program; consent of the director of the honors program is required. Students must take both HIST 403 and 404 to gain credit. Instructor permission required. Offered Fall. Instructor(s): Maas.

**HIST 404 HONORS THESIS (3)**

Continuation of HIST 403, which is prerequisite for enrollment. Completion of this course is required to obtain credit for HIST 403. Pre-requisite(s): HIST 403. Offered Spring. Instructor(s): Maas.

**HIST 409 HISTORY OF EAST AFRICA (3)**

Seminar on East African cultures, societies, economies, and politics from earliest times to the present. Includes the peoples and languages of East Africa; migrations and settlement, state formation; long-distance trade and expansions in scale, imperialism and colonial conquest; colonial transformations of African societies; nationalism, and independence. Limited enrollment. Offered Fall. Instructor(s): Odhiambo.

**HIST 410 KENYA IN MODERN HISTORY (3)**

Study of Kenya's transformation from tribal societies to modern state. Topics include migrations and settlement; emergence of pre-colonial societies, underlying cultural unities, and pre-capitalist socioeconomic formations; British conquest; colonial state and economic changes; traditions of resistance and collaboration; invention of tribes; Mau Mau; de-colonization and constitutional changes; and the postcolonial state. Limited enrollment. Offered Spring. Instructor(s): Odhiambo.

**HIST 415 THE RISE AND FALL OF THE BRITISH EMPIRE (3)**

Seminar on how the largest empire in world history came into existence, the impact it had on people and states worldwide, and its decline and fall. Course work will consist of reading, viewing, and evaluating films, and preparing and summarizing in class a research paper on a topic of choice. Recommended prerequisite(s): Some background in either British history or one of the areas impacted by the British. Limited enrollment. Not offered this academic year. Instructor(s): Wiener.

**HIST 416 SEMINAR IN CONTEMPORARY AFRICAN AMERICAN HISTORY (3)**

A reading- and writing-intensive seminar focusing on selected issues in black culture, politics, and community in the United States since the climax of the Civil Rights movement. Contents vary. Limited enrollment. Offered Spring. Instructor(s): Byrd.

**HIST 418 SEMINAR TOPICS IN THE HISTORY OF SCIENCE AND TECHNOLOGY (3)**

Research seminar on selected topics in the history of science and technology. Contents vary. Topic for Spring 2008: Science, Technology and the Cold War. Repeatable for Credit. Limited enrollment. Offered Spring.

**HIST 420 MORALITY AND HISTORY (3)**

Exploration of the idea of morality as having a history and therefore being susceptible to change. Includes selected readings, drawn mainly from Anglo-American history and philosophy that range over a period of several centuries. Limited enrollment. Offered Fall. Instructor(s): Haskell.

**HIST 421 UNSTEADY STATE: DEVELOPMENT OF THE AMERICAN ADMINISTRATIVE STATE (3)**

Seminar examines the evolution of a national administrative state in the U.S. from the early national period to the era of deregulation and focuses on structural, cultural, and historical forces that influenced this development (e.g., constitutionalism, federalism/nationalism, liberalism/republicanism, rise of industrialization and managerial capitalism, economic regulation/social welfare). Limited enrollment. Offered Fall. Instructor(s): Zansitis.

**HIST 422 SEMINAR TOPICS IN THE HISTORY OF RICE UNIVERSITY (3)**

Research seminar on selected topics in the history of the university, with papers to be based on primary sources in the Woodson Research Center of Fondren Library and/or oral interviews. Topics will include academic departments and schools, student life, administrative evolution, community involvement, and Rice in a comparative context. Limited enrollment. Offered Fall. Instructor(s): Boles.

**HIST 426 COMPARATIVE SLAVERY AND RACE RELATIONS IN THE AMERICAS (3)**

Comparative analysis of slavery and race relations in the U.S., the Caribbean, and Latin America, chiefly to the late 19th century. Includes the relative harshness or mildness of the institution of slavery in various systems, opportunities for advancement for former slaves, and the resultant nature of race relations. Limited enrollment. Not offered this academic year. Instructor(s): Cox.

**HIST 427 HISTORY OF THE CIVIL RIGHTS MOVEMENT, 1954 TO THE PRESENT (3)**

Examination of the modern Civil Rights movement, with emphasis on the goals and strategies of major spokespersons and leaders, as well as the achievements of the campaign. Includes the extent of its success or failure and whether or not an "unfinished" agenda needs to be completed. Limited enrollment. Offered Fall. Instructor(s): Cox.

**HIST 431 POLITICS AND CULTURE IN WEIMAR GERMANY (3)**

Born in political and social crisis, the Weimar Republic exemplifies the possibilities and limits of modern democracy. This seminar focuses on original documents of political thought, literature, the visual arts, society, and law to explore the political culture of Germany's first, ill-fated democracy. Cross-listed with GERM 331. Limited enrollment. Not offered this academic year. Instructor(s): Caldwell; Emden.

**HIST 432 ISLAM IN SOUTH ASIA (3)**

Seminar on Islamic history, politics, and culture in the South Asian subcontinent. Topics will include emergence of Indian Muslim society; Muslim responses to colonialism and the movement for Pakistan; and the role of Islam in politics in contemporary India, Pakistan, and Bangladesh. Requires no prior knowledge of Islam or South Asia. Cross-listed with ASIA 432, SWGS 432. Not offered this academic year. Instructor(s): Shehabuddin.

**HIST 433 THE ARAB-ISRAELI CONFLICT (3)**

Seminar traces the history and politics of the Arab-Israeli conflict. Course seeks to understand how and at what costs Israeli and Palestinian nationalisms have been constructed in both Palestinian and Israeli understandings of the past and present using books, documentaries, and films. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

**HIST 434 ISLAM AND THE WEST (3)**

Seminar explores issues of contact and exploration between Western and Islamic worlds, from the Crusades to the modern era. Investigations will explore how identities are formed and reshaped through interaction with other cultures and how traditions "invented" by relationships between civilization and despotism, freedom and tyranny, religious tolerance and holy war. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

**HIST 435 COLONIALISM AND NATIONALISM IN THE MODERN MIDDLE EAST (3)**

Seminar focuses on colonialism and nationalism in the modern Middle East. Beginning with Napoleon's invasion of Egypt in 1798, the seminar delves into specific case studies of European and Middle Eastern encounters and their representations that span both the 19th and 20th centuries. Pre-requisite(s): HIST 278 or HIST 378 or HIST 281 or HIST 283 or HIST 387. Limited enrollment. Not offered this academic year. Instructor(s): Makdisi.

**HIST 436 AMERICA IN THE MIDDLE EAST (3)**

Seminar explores evolution of American involvement in the Middle East from missionary origins in the early 19th century to superpower hegemony in the 20th. Putting into perspective central issues such as the U.S. role in the Arab-Israeli conflict, the question of terrorism, and the U.S. invasion/occupation of Iraq in 2003. Pre-requisite(s): HIST 278 or HIST 378 or HIST 281 or HIST 283 or HIST 387. Limited enrollment. Offered Fall. Instructor(s): Makdisi.

**HIST 437 CHRISTIANS AND JEWS IN THE MEDIEVAL ISLAMIC WORLD (3)**

Examination of Christian and Jewish communities in the Islamic world from the rise of Islam to the Ottoman Empire. Topics include the "dhimmis" (protected peoples); social and economic life; communal organization; and interplay of religious laws and political authority. Discussions focus on modern historiography and Muslim communities under Christian rule. Cross-listed with MDST 385. Limited enrollment. Offered Spring. Instructor(s): Sanders.

**HIST 438 WOMEN, GENDER, AND SEXUALITY IN MEDIEVAL ISLAMIC SOCIETIES (3)**

Seminar examines the legal position and social realities of men and women in the Islamic world, with emphasis on how boundaries of gender have traditionally been drawn. Includes family and sexual ethics, the harem, polygyny, divorce, and eunuchs (who played an important role in the military and certain religious institutions). Cross-listed with MDST 438, SWGS 455. Limited enrollment. Not offered this academic year. Instructor(s): Sanders.

**HIST 439 COMPARATIVE SLAVERY FROM ANTIQUITY TO THE PRESENT: AFRICA, ASIA, AND EUROPE (3)**

Seminar introduces the debates on the history of slavery in human society. Examines case studies in Africa, Asia and Europe with comparative analyses of topics: slavery and the state; slavery and gender; slave trades; and slave resistance. Limited enrollment. Not offered this academic year. Instructor(s): Ward.

**HIST 440 THE FUTURE OF THE UNIVERSITY (3)**

Research seminar will examine and place in historical context current controversies over the future of the modern American research university. Students will prepare papers based on the archival records of Rice University and secondary literature on other universities. May not be in any of the following Classification(s): Freshman, Sophomore. Limited enrollment. Not offered this academic year. Instructor(s): Haskell.

**HIST 442 THE RENAISSANCE IN EUROPEAN HISTORY (3)**

Seminar examines major approaches to and interpretations of the European Renaissance (the period from about 1350-1600) and then analyzes the place that this era came to occupy in our understanding of "western civilization" and of European history generally. Graduate/Undergraduate version: HIST 542. Limited enrollment. Not offered this academic year. Instructor(s): Quillen.

**HIST 443 GENDER AND SOCIETY IN EARLY MODERN EUROPE (3)**

Exploration of the relationship between ideas about gender and the social, political, and legal institutions in Europe from c. 1350 to 1800. Includes the structure and role of the family; gender roles in religious institutions, and the regulation of sexuality. Cross-listed with SWGS 463. Not offered this academic year. Instructor(s): Quillen.

**HIST 445 JEWS IN IMAGE AND FILM (3)**

Seminar course will trace the perceptions of Jews and of certain themes in Jewish history from the Middle Ages to modern times. Focus will be placed on their representation in medieval and early modern images of Christian and Jewish art and on modern film. Limited enrollment. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 446 MEDIEVAL WOMEN (3)**

Many aspects of today's life for women go back to developments in Medieval times. Seminar explores the freedom and restrictions of women from different religions, queens and nobles, merchants to prostitutes, in families and monasteries. Participation may also include a trip to significant sights in Germany. Cross-listed with MDST 446. Limited enrollment. Offered Fall. Instructor(s): Haverkamp.

**HIST 447 THE AGE OF THE CRUSADES (3)**

Seminar will discuss characteristics of the Crusades against Muslim, Jews, pagans, Mongols, heretics, schismatics, and political enemies and explore to what extent the concepts of "holy war" and new expressions of religious beliefs impacted fundamentalism creating new possibilities for globalization in medieval Europe. Discussions will include primary and secondary sources. Cross-listed with MDST 447. Limited enrollment. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 449 CITY LIFE IN THE MIDDLE AGES (3)**

Medieval cities provided as many opportunities for political, economic, social and religious enterprises as their modern counterparts. Housing a variety of religious communities, these cultural centers differed profoundly across Europe and the Islamic world. This seminar will discuss these characteristics and explore them on a 10-day trip to Germany. Limited enrollment. Instructor(s): Haverkamp.

**HIST 452 COMPARATIVE HISTORY: THE U.S. AND SOUTH AFRICA (3)**

Seminar compares and contrasts the history of two modern societies based on the foundation of racial division and exploitation. Examination will include historical evolution of white racism in both nations; comparing systems of segregation and apartheid; and the history of the civil rights and anti-apartheid movements. Limited enrollment. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 453 DEFINING MARRIAGE: GENDER AND THE STATE IN U.S. HISTORY (3)**

Seminar will exam marriage as an institution and what it has meant at different times in U.S. history by considering its legal context, changing cultural meaning, and importance to political debates over issues such as immigration, emancipation, and religious freedom. Limited enrollment. Instructor(s): Kenny.

**HIST 455 HISTORY OF HUMAN RIGHTS (3)**

Seminar will explore the history of human rights through disciplines of anthropology and legal philosophy as well as historical case studies of individual states and human rights organizations. Students will undertake independent research on an issue, location, and period of their choosing. Limited enrollment. Offered Fall. Instructor(s): Wildenthal.

**HIST 459 TOPICS IN MODERN GERMAN HISTORY (3)**

Seminar on selected topics in the history of Germany. Contents vary. Cross-listed with GERM 332. Limited enrollment. Offered Spring. Instructor(s): Caldwell.

**HIST 460 ADVANCED SEMINAR IN ANCIENT HISTORY (3)**

Topic for Spring 2008 examines the causes and consequences of the collapse of Roman government in Western Europe during the 5th century AD. Through study of translated ancient sources and modern interpretations, seminar will consider the continuity of Roman culture and the formation of new Germanic kingdoms at the end of antiquity. Pre-requisite(s): HIST 201 and HIST 307 or permission of instructor. Limited enrollment. Not offered this academic year. Instructor(s): Maas.

**HIST 464 SEMINAR TOPICS IN U.S. HISTORY, 1945-1974 (3)**

Seminar requiring three short research papers. Limited enrollment. Offered Spring. Instructor(s): Matusow.

**HIST 465 FROM ROANOKE TO JAMESTOWN (3)**

English colonization of North America from 1580 to 1625. topics include English ideologies of colonization, Indian responses to the English invasion at Roanoke and in the Chesapeake, and the controversy over the 400th anniversary of the founding of Jamestown in 2007. Limited enrollment. Limited enrollment. Offered Fall. Instructor(s): Goetz.

**HIST 467 GENDER AND EMPIRE (3)**

Seminar examines role of women in U.S. imperial projects across the 19/20th centuries and the importance of gender and race to the history of "imperial democracy." Topics include continental expansion in the U.S. west, overseas mission in Hawai'i and Caribbean, and colonial projects in Puerto Rico and Philippines. Limited enrollment. Not offered this academic year. Instructor(s): Sneider.

**HIST 468 WOMEN AND THE WELFARE STATE: SEXUAL POLITICS AND AMERICAN POVERTY (3)**

Seminar in the history of women and welfare focuses on women's contributions to the growth of the welfare state and investigates how welfare has been shaped by understandings of gender, race, and class. Compares American programs to similar programs developed in other countries. Cross-listed with SWGS 468. Limited enrollment. Not offered this academic year. Instructor(s): Sneider.

**HIST 471 SEMINAR TOPICS IN MODERN FRENCH HISTORY (3)**

Research seminar on selected topics in modern French history. Contents vary. Limited enrollment. Not offered this academic year. Instructor(s): Cohen.

**HIST 473 SEMINAR TOPICS IN EUROPEAN INTELLECTUAL****HISTORY (3)**

Research seminar on selected topics in modern European intellectual history. Contents vary. Limited enrollment. Not offered this academic year. Instructor(s): Zammito.

**HIST 474 FRENCH INTELLECTUALS (3)**

Seminar investigates the history of a prominent French political figure: the "intellectual" born out the Dreyfus Affair (1895), whose prestige culminated in the post-1945 period before vanishing influence of Marxism after 1989. The course explores the world of French intellectuals and their role in the 20th Century. Limited enrollment. Not offered this academic year. Instructor(s): Cohen.

**HIST 475 INTELLECTUALS AND POLITICS IN THE 20TH CENTURY EUROPE (3)**

Seminar explores intellectuals in politics throughout the 20th Century, investigating the figure of the "committed intellectual" and its attraction to revolution, fascism, anti-colonialism, human rights and anti-globalization. Special emphasis given to Emile Zola, Rosa Luxemburg, Maxime Gorki, Jean Paul Sartre, Simone de Beauvoir, Susan Sontag, Vaclav Havel, and Edward Said. Limited enrollment. Offered Spring. Instructor(s): Cohen.

**HIST 476 NATION AND CULTURE IN MODERN MEXICO (3)**

Course looks at the formation of Mexican national identity in the 19th and 20th centuries. Focusing on texts that examine the relationship between culture and nation-building projects, the role of literary and artistic projects in movements for social change, and the connection between cultural and political history. Limited enrollment. Not offered this academic year. Instructor(s): Serna.

**HIST 484 SECURING AMERICA I, 1607-1865 (3)**

How did British North Americans and citizens of the new United States provide for their security from Jamestown to Appomattox? Undergraduate seminar will consider that question in its political, social, and military dimensions. Limited enrollment. Offered Spring. Instructor(s): Gruber.

**HIST 485 SECURING AMERICA II, 1865 - 2007 (3)**

Seminar that considers the political, social, economic, and military dimensions of providing for the security of the United States in the modern world. Limited enrollment. Limited enrollment. Not offered this academic year. Instructor(s): Gruber.

**HIST 486 SEX, LIES AND DEPOSITIONS: MICROHISTORIES OF VIRGINIA COUNTY COURT RECORDS (3)**

Court records are fascinating sources for understanding the ordinary and extraordinary experiences of early Virginians. Students will read 17th and early 18th century court records and write a research paper based on selected court cases, learning the historian's craft of researching and writing about the past. Limited enrollment. Not offered this academic year. Instructor(s): Goetz.

**HIST 488 TOPICS IN MEDIEVAL HISTORY (3)**

Research seminar on selected issues, subject or themes in medieval history. Cross-listed with MDST 488. Not offered this academic year. Instructor(s): Haverkamp.

**HIST 493 GREAT ISLAMIC EMPIRES OF THE EARLY MODERN AGE (3)**

The Ottoman, Safavid, Mughal and Uzbek Empires shared similar origins but each developed distinct imperial understandings of power and legitimacy, gender, religion, aesthetics. This seminar is a comparative and cross-regional study of early modern Islamic culture and society, its inspiration and legacy. Limited enrollment. Offered Fall.

**HIST 496 A TURBULENT TIME: THE WORLD OF THE HAITIAN REVOLUTION (3)**

An examination of the impact of the powerful forces unleashed by the Haitian Revolution on societies in the Caribbean, the U.S., and Latin America in the late 18th and early 19th centuries. Limited enrollment. Not offered this academic year. Instructor(s): Cox.

**HIST 498 PROJECTS IN AFRO-AMERICAN HISTORY (3)**

Seminar in which participants propose and execute a collaborative project in Afro-American history. Work will culminate with a substantive piece of public history (group publication, exhibit, broadcast, or electronic document, for example). For further information, or to suggest a possible project, contact the instructor. Repeatable for Credit. Limited enrollment. Not offered this academic year. Instructor(s): Byrd.

**HIST 499 CITY LIFE IN THE MIDDLE AGES (3)**

Medieval cities provided as many opportunities for political, economic, social and religious enterprises as their modern counterparts. Housing a variety of religious communities, these cultural center differed profoundly across Europe and the Islamic world. This seminar will discuss these characteristics and explore them on a 10-day trip to Germany. Limited enrollment. Offered Spring. Instructor(s): Haverkamp.

**HIST 509 DIRECTED READINGS (4)**

Graduate level, independent readings course. Topics vary. Repeatable for Credit. Offered Fall & Spring.

**HIST 510 DIRECTED READINGS (4)**

Graduate level, independent reading course. Topics vary. Repeatable for Credit. Offered Fall & Spring.

**HIST 534 CIVILIZING MISSIONS (4)**

The development of "civilizing missions" legitimized territorial and spiritual conquest and validated the suppression of subject customs, cultures, and religions. Course will explore the idea, which became an integral part of imperial, religious, and national ideologies. Readings include (in translation) modern historical, geographical, legal, ethnographic, religious, and literary texts. Not offered this academic year. Instructor(s): Makdisi.

**HIST 537 COMPARATIVE EMPIRES (4)**

Graduate seminar examines Roman and Ottoman notions of empire. European and Eastern historiography of empire in the 18 & 19th centuries, and imperial practice as it was conceived and carried out in both the Ottoman and British contexts (focusing primarily, but not exclusively, on Egypt and India). Not offered this academic year. Instructor(s): Sanders.

**HIST 541 HISTORY OF THE MODERN SOUTH (4)**

Seminar designed to introduce graduate students to historiographic background, sources, and methods for conducting primary research in post-1865 southern U.S. history. Topics will include, but not be limited to: labor, politics, and civil rights. Research paper required. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 542 THE RENAISSANCE IN EUROPEAN HISTORY (4)**

Graduate version of HIST 442. Students may not receive credit for both HIST 442 and HIST 542. Graduate/Undergraduate version: HIST 442. Not offered this academic year. Instructor(s): Quillen.

**HIST 543 TOPICS IN MODERN EUROPEAN HISTORY (4)**

Graduate research seminar on selected themes in modern European history. Contents vary. Repeatable for Credit. Not offered this academic year. Instructor(s): Caldwell.

**HIST 544 MAX WEBER (4)**

Graduate seminar, examines sociologist Max Weber in context. Focus on: Weber's methodology and notion of the "ideal type"; modernization theory; the typologies of religious and political understanding; political sociology; the crisis of German liberalism in Weber's own politics. Undergraduates admitted with permission of the instructor. Not offered this academic year. Instructor(s): Caldwell.

**HIST 545 WOMEN AND GENDER: EUROPE AND BEYOND (4)**

Graduate seminar exploring recent work in key areas of research on women and gender: nationalisms; the modern welfare state; and the challenges, which histories of working-class women have posed to definitions of politics, feminism, class, and family. Settings will include colonial Britain, India, Africa, Netherlands, Indonesia, France, and Germany. Cross-listed with SWGS 545. Not offered this academic year. Instructor(s): Wildenthal.

**HIST 546 KARL MARX IN CONTEXT (4)**

Graduate seminar focuses on reading key works of Marx in the context of post-idealist philosophy, German politics, European social thought, and industrialization. Undergraduates permitted with permission of instructor. Not offered this academic year. Instructor(s): Caldwell.

**HIST 550 MAIN ISSUES IN CARIBBEAN HISTORY (4)**

Examination of the major local and international forces and ideas that have shaped the course of the history of the Caribbean. Not offered this academic year. Instructor(s): Cox.

**HIST 551 U.S. WOMEN'S HISTORY (4)**

Graduate Seminar. Contents vary. Cross-listed with SWGS 551. Not offered this academic year. Instructor(s): Sneider.

**HIST 553 HUMAN RIGHTS (4)**

Graduate seminar will explore the history of human rights through disciplines of anthropology and legal philosophy as well as historical case studies of individual states and human rights organizations. Not offered this academic year. Instructor(s): Wildenthal.

**HIST 559 MIGRATION AND DISPLACEMENT IN MODERN EUROPEAN HISTORY (4)**

Seminar investigates the historiography of migration in European history, from the point of view of labor immigration, forced displacement and political exile. Exploration of how nation-states have invited, categorized, regulated and repelled various types of European migrants since the end of the 19th century. Not offered this academic year. Instructor(s): Cohen.

**HIST 560 AFRICAN AMERICAN STUDIES RESEARCH SEMINAR (4)**

Interdisciplinary graduate research seminar in African American studies. Contents vary. Cross-listed with RELI 552. Not offered this academic year. Instructor(s): Byrd; Cox; Pinn.

**HIST 561 GRADUATE TOPICS IN EUROPEAN INTELLECTUAL HISTORY (4)**

Graduate research seminar on selected themes in European intellectual history. Contents vary. Reading knowledge of French or German is not required, but definitely advantageous. Not offered this academic year.

**HIST 562 SHAPING OF THE POST-WAR ORDER, 1945-1955 (4)**

Seminar examines how a new "post-war order" emerged in the U.S. and Western Europe during the decade following WWII. Emphasis on international and domestic features: rise of international institutions, welfare states and planning, ethnic cleansing and population management, effects of the Marshall Plan and Americanization, European integration and race relations. Offered Spring. Instructor(s): Cohen.



**HIST 566 NORTH AMERICA, 1500-1800 (4)**

Overview of historical literature pertaining to British North America and the Atlantic World from 1500 to 1800. Related topics in Spanish and French North America also considered. Repeatable for Credit. Not offered this academic year. Instructor(s): Goetz.

**HIST 567 RACE IN EARLY AMERICA (4)**

Graduate research seminar focusing on the complicated and often perilous history of race as a concept in early North America. Not offered this academic year. Instructor(s): Goetz

**HIST 568 GRADUATE READING SEMINAR IN POST-1945 U.S.****HISTORY (4)**

Readings seminar for graduate students on post-1945 United States history. Contents vary. Repeatable for Credit. Offered Fall. Instructor(s): Matusow.

**HIST 569 RACE, LABOR, AND REGION IN AMERICAN HISTORY (4)**

Graduate seminar focusing on the struggle over jobs, equality, and civil rights in both the American South and the Southwest, from the 1880s to the 1960s. Readings will allow comparisons of Mexican-American, African-American and white working class experiences. Not offered this academic year. Instructor(s): Lichtenstein

**HIST 570 20TH CENTURY AMERICAN CONSERVATION MOVEMENT (4)**

Exploration of the American conservation movement from Pres. Theodore Roosevelt, Sierra Club founder John Muir, and Chief of the U.S. Forest Service Gifford Pinchot to naturalists John Burrough and John Perkins Marsh -focusing on their work in context of current issues in global warming, and wetlands restoration. Offered Fall.

**HIST 571 TOPICS IN MODERN FRENCH HISTORY (4)**

Readings seminar for graduate students in modern French history. Contents vary. Not offered this academic year. Instructor(s): Cohen.

**HIST 575 INTRODUCTION TO DOCTORAL STUDIES (4)**

Introduction to a range of methodological and theoretical approaches to historical research, as well as to important current debates about the nature of historical investigation and interpretation. Offered Fall. Instructor(s): Caldwell.

**HIST 576 TOPICS IN U.S. WOMEN'S HISTORY (4)**

Graduate seminar. Contents vary. Cross-listed with SWGS 576. Not offered this academic year. Instructor(s): Sneider.

**HIST 577 PEDAGOGY SEMINAR (2)**

For ABD students who intend to teach. Recommended prerequisite(s): ABD graduate status. Offered Fall. Instructor(s): Smith, R.

**HIST 578 GRADUATE TOPICS IN SOUTHERN HISTORY (4)**

Graduate reading seminar will entail in-depth examination of the historiography of particular issues in the history of the American South. Topics will vary. Not offered this academic year. Instructor(s): Lichtenstein.

**HIST 581 BRITISH AND IMPERIAL HISTORY, I (4)**

Reading seminar in British and Imperial History. Open to all graduate students. Required for graduate students in British history. Offered Spring. Instructor(s): Weiner.

**HIST 582 BRITISH AND IMPERIAL HISTORY, II (4)**

Continuation of HIST 581. Not offered this academic year. Instructor(s): Weiner.

**HIST 583 SOUTHERN HISTORY (4)**

Graduate seminar on religion and slavery in the Old South. Not offered this academic year. Instructor(s): Boles.

**HIST 584 THE EARLY SOUTH, 1600 -1800 (4)**

Graduate research seminar focusing on the southern portions of colonial British North America. Limited enrollment. Offered Spring. Instructor(s): Goetz.

**HIST 587 U.S. INTELLECTUAL/CULTURAL HISTORY (4)**

Graduate reading seminar in U.S. cultural and intellectual history. Contents vary. Not offered this academic year. Instructor(s): Haskell.

**HIST 589 HISTORIOGRAPHY OF MAU MAU (4)**

Graduate reading seminar on the historiography of Mau Mau. Not offered this academic year. Instructor(s): Odhiambo.

**HIST 590 INTRODUCTION TO WORLD HISTORY (4)**

Graduate reading seminar in world history. Offered Spring. Instructor(s): Ward.

**HIST 591 GRADUATE READING (1)**

Graduate reading in conjunction with another course. Repeatable for Credit. Offered Fall & Spring.

**HIST 595 THE AMERICAN SOUTH (4)**

Graduate reading seminar on major scholarly literature of southern history. Includes readings, discussions, and a major paper on historiographical topic decided in consultation with the instructor. Offered Fall. Instructor(s): Boles.

**HIST 599 ADVANCED MUSEUM STUDIES (4)**

Repeatable for credit. Offered as necessary. Repeatable for Credit.

**HIST 601 MASTER'S THESIS RESEARCH (4)**

Research for master's thesis. Must take both HIST 601 and 602 to receive credit. Not offered this academic year.

**HIST 602 MASTER'S THESIS RESEARCH (4)**

Continuation of HIST 601. Must complete both HIST 601 and 602 to receive credit. Not offered this academic year.

**HIST 800 PH.D. RESEARCH (9 TO 12)**

Research for doctoral dissertation. Repeatable for Credit. Offered Fall & Spring.

**HONS (HONORS PROGRAM)****No College Designated/Rice Undergraduate Scholar Program****HONS 470 RICE UNDERGRADUATE SCHOLARS PROGRAM (3)**

The RUSP program is designed for students in any department who may be considering graduate school and/or careers in research or scholarship. The course centers on individual research projects that are supervised by a faculty member, who is identified by the student. This faculty member meets regularly with the student and serves as a mentor. Modest funds are available to support costs of the research projects. Weekly class meetings feature presentations on topics related to research and scholarship. In addition, each student gives an oral presentation on his/her project's discipline. Enrollment by permission of course faculty, based on applications submitted in the previous Spring term. Instructor permission required. Offered Fall. URL: [www.owlnet.rice.edu/~hons470/](http://www.owlnet.rice.edu/~hons470/). Instructor(s): Johnson; Watkins; Wildenthal.

**HONS 471 RICE UNDERGRADUATE SCHOLARS PROGRAM (RUSP) (1 TO 6)**

Continuation of HONS 470. Credit variable (generally 3-6 hours, depending on the scope of the research project). Participants continue the research projects and interactions with faculty mentors. Weekly class meetings again feature presentations and discussion of research-related topics. At the end of the term, each student gives an oral presentation and submits a final paper in the style of a journal article in his/her research area. Instructor permission required. Offered Spring. URL: [www.owlnet.rice.edu/~hons470/](http://www.owlnet.rice.edu/~hons470/). Instructor(s): Johnson; Watkins; Wildenthal.

**HUMA (HUMANITIES)****School of Humanities/Humanities Division****HUMA 101 FROM ANCIENT GREECE TO MEDIEVAL ISLAM: INTRODUCTION TO WESTERN LITERATURE, HISTORY, AND PHILOSOPHY (3)**

Study of the foundational intellectual and artistic texts of the western tradition from Ancient Greece to Medieval Islam. Consideration of texts and images over time and in their historical development as we reflect on who we are and how we got here. Readings from Homer, Plato, the Hebrew Bible, the New Testament, Thucydides, Vergil, Augustine, and the Qu'ran. Limited enrollment.

**HUMA 102 FROM RENAISSANCE TO PRESENT: INTRODUCTION TO WESTERN LITERATURE, HISTORY, AND PHILOSOPHY (3)**

Study of the foundational intellectual and artistic texts of the Western tradition from the Renaissance to Einstein. Consideration of texts and images over time and in their historical development as we reflect on who are and how we got here. Readings from Machiavelli, Shakespeare, Kant, Flaubert, Nietzsche, Freud, Beauvoir, Einstein, Levi, Kuhn, Borges, and King, and images from such artists as Michelangelo, Goya, and Picasso.

**HUMA 103 LIBERTY AND TERROR: THE FRENCH REVOLUTION (3)**

The French Revolution toppled an ancient monarchy and sent shockwaves throughout the world. We will interpret the historical sources, contexts, and problems of this watershed moment and investigate the problems by political, philosophical, literary, and visual documents regarding the pre-revolutionary status quo, the transformation of political liberty into repressive terror, the rise of Napoleon, worldwide warfare, and ideological struggle. The course will focus on historical contexts such as the influence of the Enlightenment; the emergence of citizenship and human rights; the development of social spectacles and the public sphere; the Reign of Terror and the regression to Tyranny; emancipationist discourses (the abolition of slavery, colonial revolt, radical feminism); and the contradictory figure of Napoleon. We will consider, finally, how the Revolution has come to be viewed, both within France and without, considering its many aftershocks and reverberations up until the present day. Limited enrollment. Offered Fall.

**HUMA 104 TRANSCULTURAL ENCOUNTERS: FROM THE ANCIENT WORLD TO CONTEMPORARY GLOBALIZATION (3)**

Explores interactions between cultures from early modern period to the present day through films, novels, memoirs and travelogues, bringing alive the experiences of historical and fictional figures, who, through colonialism, trade, war and conflict, travel, and migration, find themselves face to face with people who are not like them, and in particular, their responses to these new situations. Limited enrollment. Offered Spring.

**HUMA 107 GREEK CIVILIZATION AND ITS LEGACY (3)**

An examination of the literary, artistic, and intellectual achievements of classical Greek civilization from Homer through the golden age of classical Athens to the spread of Greek culture in the Hellenistic world. The influence of ancient Greece on Western culture will be a focus. Case studies in the later reception of classical Greek literature (e.g. tragedy), philosophy (e.g., Socrates), history (e.g., democracy), and art (e.g., Parthenon) will be examined. Cross-listed with CLAS 107. Limited enrollment. Instructor(s): Yunis.

**HUMA 108 ART IN CONTEXT: LATE MEDIEVAL AND RENAISSANCE CULTURE (3)**

This course will be concerned with art, architecture, and history of the late middle-ages and Renaissance. We will employ historical texts, literature, and illustrations of works of art, showing how historical documents and sources can illuminate the culture context of art and architecture. Cross-listed with HART 240, MDST 108. Limited enrollment. Instructor(s): Neagley; Manca.

**HUMA 110 LITERATURE AND DEMOCRACY (3)**

Course examines how writers respond to the developments and problems of democratic societies. Topics include: civil disobedience and just dissent; the civil war and the extension of the franchise; cruel and unusual punishment exercised by governments; and the relationship between privacy and individuality. Requirements: two essays and one class presentation. Cross-listed with FSEM 110. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Wihl.

**HUMA 111 ROMAN CIVILIZATION AND ITS LEGACY (3)**

This course will investigate central aspects of Roman civilization: politics, religion, law, oratory, private life, public entertainment, literature, and visual art and architecture. Through case studies, we will also examine the place of ancient Rome in the western imagination, and the influence of ancient Rome on later politics, literature, and art. Cross-listed with CLAS 108. Limited enrollment. Offered Spring. URL: <http://classicallegacy.rice.edu/>. Instructor(s): McGill.

**HUMA 201 PUBLIC SPEAKING (3)**

This course is designed to give the student exposure to and experience using basic principles and skills of oral communication in the public context. Emphasis will be on the development of speech organization, support, and delivery. Informative and persuasive speeches will be practiced. An important outcome of the course is that the student better understands and appreciates the important role public speaking plays in modern society. Limited enrollment.

**HUMA 210 FORENSICS PRACTICUM (1)**

This course will focus on junior varsity intercollegiate speech and debate competition. Students will be required to prepare speeches and debate material for local, regional and possibly national competitions. Participation in intercollegiate competition is mandatory. Instructor permission required. Repeatable for Credit.

**HUMA 212 CAREER AND LIFE OPTIONS (1)**

This class is intended for freshmen and sophomores who are exploring careers and academic majors (juniors and seniors are also welcome to enroll). In the class students will learn about career options that match their interests, personality, and values; become more familiar with the world of work and various career options; understand the connections between careers and major choice; learn about services that will enhance their marketability and academic experiences (internships, study abroad programs, scholarships/grants); and develop an action plan to reach their goals. This class is ideally suited for students who have no idea what they want to do after they graduate. Instructor(s): J. Hing; N. Laidlaw.

**HUMA 235 THE WORLD AND THE WEST (3)**

Introduction to the last 500 years of world history, focusing on those processes that define the modern period. Topics including industrialization, democratization, colonialism, and the emergence of new forms of cultural production with exploration of how and why such processes have come to divide the modern world into a west and non-west. Cross-listed with HIST 235. Instructor(s): Quillen.

**HUMA 250 WRITING FOR PRINT MEDIA (3)**

Introduction to news gathering and writing, and the analytical skills needed to determine what constitutes news. The class will combine in-depth reporting assignments and critiques, lectures covering the breadth of news-gathering (print, broadcast and online), and discussions of the role of decision-making in shaping the news. Limited enrollment. Instructor(s): Crocker.

**HUMA 251 PRINCIPLES OF TYPOGRAPHY AND DESIGN (3)**

Smart use of type communicates its message clearly. The digital age has spawned legions of new designers, but the old rules still apply. Through interactive lectures and hands-on exercises, students will develop sensitivity to the variables in typographic design (face, weight, size, leading, color) and learn to solve problems of visual communication. Limited enrollment. Offered Spring. URL: <http://www.ruf.rice.edu/~stumedia/design.htm>. Instructor(s): Cooper.

**HUMA 254 INDEPENDENT STUDY IN TYPOGRAPHY/DESIGN (2)**

Independent study in Typography and Design. Primarily for students who have completed HUMA 251 and wish to continue their studies independently at an advanced level. Permission of instructor is required. Instructor permission required.

**HUMA 260 GENOMICS AND SOCIAL TRANSFORMATION (3)**

Course will critically examine the transformative potential attributed to emergent genomic technologies in medicine and biomedical research. The course is intended for students in the humanities and natural sciences who want to learn more about the social and cultural meanings attributed to genomics. Offered Spring. Instructor(s): Sharp; Majumder.

**HUMA 261 COMPLEMENTARY AND ALTERNATIVE MEDICINE: AN ETHNOGRAPHIC EXPLORATION OF HEALTH AND DISEASE (3)**

Examine a variety of folk and popular health belief systems known as complementary and alternative medicine. Drawing on works of narrative, legal sources, and articles in the medical literature, we will compare the different health belief systems with conventional biomedicine and discuss society's response to them. Offered Fall. Instructor(s): McGuire; McCullough.

**HUMA 262 PLURALISM AND BIOMEDICINE (3)**

Examine from a cross-disciplinary perspective the significance of pluralism in contemporary life through in-depth consideration of a series of recent clinical controversies (e.g. the Schiavon case and parental refusal of standard treatment) and research debates (e.g. stem cell research, sex/gender selection). Offered Spring. Instructor(s): Majumder; Sharp.

**HUMA 295 CURRENT ISSUES IN THE WORKPLACE (3)**

This class is the companion course for the Joint Venture Liberal Arts Internship Program. It is intended to provide liberal arts majors an overview to the various career options available to them and introduce issues that are shaping the world of work. Each week, guest speakers will discuss different career alternatives, including banking, law, writing and journalism, non-profit management, and education. Additionally, students read current business articles to examine trends that are redefining how work is performed. All students enrolled in HUMA 295 must complete an approved internship. For more information, read about the Joint Venture Liberal Arts Internship Program. This class is taught during both the fall and spring semester; Joint Venture Internships are available during fall, spring and summer. Instructor(s): J. Hing.

**HUMA 301 RHETORICAL CRITICISM (3)**

This course emphasizes the study of historical and contemporary speech texts and other forms of public communication and surveys the major approaches in scholarly rhetorical criticism from ancient to contemporary times. The course will focus on learning and applying the methods to communication artifacts. Because rhetorical criticism is an interdisciplinary endeavor, the course will survey material from many fields. The goal of the course is to come away with basic knowledge of several approaches and detailed knowledge of at least one approach. A better understanding of the construction of public communication is an important outcome of the course. Limited enrollment. Instructor(s): Grace.

**HUMA 302 THEORIES OF RHETORICAL COMMUNICATION (3)**

This course will survey major theorists of speech and public communication ranging from classical to contemporary thinkers. Emphasis will be on understanding speech and public communication from consumer and scholarly perspectives. Students are expected to read and discuss material with the goals of gaining basic understanding of major rhetorical theorists specifically engage a particular topic in rhetorical theory. Our central questions involve the nature of and relationship between speaker, text, and audience. Limited enrollment. Instructor(s): Worth.

**HUMA 303 PERSUASION AND POLITICAL RHETORIC (3)**

This course will survey research and writing in the fields of persuasion and political communication. Of particular interest will be explanations of political communication based in rhetorical theory. Students will study historically important political speeches, debates, and advertisements. Emphasis will be on academic exploration of political rhetoric as human expression. Instructor(s): Worth; Grace.

**HUMA 305 ADVANCED PUBLIC SPEAKING (3)**

Designed for students with at least two prior years of instruction or public speaking experience. Will address the ancient origins of speech theory and will require students to apply contemporary speech theory in the presentation of four in-class speeches. Instructor permission required.

**HUMA 306 RHETORIC OF SCIENCE AND TECHNOLOGY (3)**

This course will explore the rhetoric of science and technology through examination of historically important speeches, campaigns, and other persuasive expression that has contributed to contemporary scientific and technological culture. Emphasis will be on the communication associated with scientific and technological culture rather than on the science or technology. The primary question for the course is, "How are science and technology expressed and persuasively promoted as human activities?" Instructor(s): Worth.

**HUMA 308 BUSINESS AND PROFESSIONAL SPEAKING (3)**

Practical application of communication theory with emphasis on oral presentations, interviewing and small group dynamics. The course will consider many aspects of the business and professional sphere as they pertain to public speaking and public discourse. Through a series of four or more in-class speeches, in-class group exercises, outside speaker presentations, reading, and writing, the course will serve as basis of instruction to ready the student for the public or private sphere. Class will focus particularly on aspects of business and professional leadership communication, and business and office communications both written and oral, toward a greater mastery of authentic organizational, management, competitive, and community discourse.

**HUMA 309 ARGUMENTATION AND DEBATE (3)**

Designed to help students develop communication, analysis, and research skills through the construction and presentation of arguments on questions of fact, value, and policy. Debate assignments will explore current issues. The course emphasizes argumentation exercises and in-class debates.

**HUMA 310 ADVANCED FORENSICS PRACTICUM (1)**

This course will focus on varsity intercollegiate speech and debate competition. Students will be required to prepare speeches and debate material for local, regional, and possibly national competitions. Participation in intercollegiate competition is mandatory. Instructor permission required. Repeatable for Credit.

**HUMA 311 THE RHETORIC OF LEADERSHIP (3)**

This course will examine the relationship between leadership and communication within organizations. Explore leadership as a communication phenomenon. Emphasis will be on leadership as a set of relationships that manifest themselves in practices that arise from the implementation of theory. Historical and contemporary leadership and communication theory will be surveyed. An important outcome is an increased understanding of the relationship between communication and leadership. Limited enrollment.

**HUMA 321 EUROPEAN WOMEN FILMMAKERS (3)**

Mapping German Culture. Filmmaking has celebrated its first hundred years. Women's contributions were significant and deserve to widen the film canon for all filmgoers. The course will concentrate on films by European women directors, taking into account aesthetic particularities, gender commitment, and post-feminist attempts. Importance will also be given to the contexts and conditions of women's film production. All films are subtitled in English. Taught in English with possible FLAC section. Cross-listed with GERM 321, HART 385, SWGS 358. Limited enrollment. Not offered this academic year.

**HUMA 322 MARX, FREUD, EINSTEIN, FOREBEARERS OF MODERNITY (3)**

Mapping German Culture. Like no others, these three thinkers of the 19th and 20th century have influenced the intellectual, historical, social, and cultural development not only of Germany, but of the entire world. The course examines the works of these authors in the context of their own time as well as their continued importance in the present. Works by Brecht, Christa Wolf, Schnitzler, Kafka will also be considered. Taught in English with possible FLAC section. Cross-listed with GERM 322. Not offered this academic year. Instructor(s): Weissenberger.

**HUMA 324 BERLIN, RESIDENCE, METROPOLIS, CAPITAL (3)**

Mapping German Culture. The course offers an introduction to Germany history, politics, and culture as mirrored in the history of the old and new German capital. Berlin has always been a city of contradictions: from imperial glamour to proletarian slums, from the Roaring Twenties to Hitler's seizure of power. Emerging from the ruins of WW II Berlin became the both the capital of Socialism and the display window of the Free World. After the fall of the wall, Berlin is still looking for its role in the center of a reshaped Europe. Readings and discussions encompass fine arts and literature from the 18th century to the present, including film. Cross-listed with GERM 324. Not offered this academic year. Instructor(s): Steiner.

**HUMA 325 GERMAN NOBEL PRIZE LAUREATES (3)**

The course will introduce biography of Alfred Nobel and the reasons for establishing his famous Nobel Prize. Most famous among German recipients were Thomas Mann (1929), Herman Hesse (1946), Heinrich Boll (1972) and Gunter Grass (1999). Their novel work will be analyzed as an artistic reflection of their socio-critical thoughts on the history of Germany. Taught in English with possible FLAC section. Cross-listed with GERM 325. Not offered this academic year.

**HUMA 328 GERMAN ADAPTATIONS: TEXT TO FILM (3)**

Mapping German Culture. Prominent novels of the 20th century will be studied for their possibilities or impossibilities of rendition from print medium to cinematic medium. From the myriad of adaptations we will concentrate on Thomas Mann: *Tod in Venedig*; Franz Kafka: *Das Schloss*; Klaus Mann: *Mehisto*; Gunter Grass: *Die Blechtrommel*; H. Boll: *Katharina Blum*; Jurek Becker: *Jacob der Lugner*. All films are subtitled in English. Course taught in English with a possible FLAC section. Cross-listed with GERM 328. Limited enrollment. Not offered this academic year.

**HUMA 329 LITERATURE OF THE HOLOCAUST AND EXILE (3)**

Mapping German Culture. Most of the authors from Germany and Austria, who were persecuted and fled into exile, used literature to search for meaning in life that apparently had been stripped of all meaning. Among these authors are the most distinguished writers of time, i.e. Th. and H. Mann, Brecht, Benjamin, Werfel, Doblin, J. Roth, S. Zweig, N. Sachs, Celan, Auslander. Taught in English with a possible FLAC section. Cross-listed with GERM 329. Limited enrollment. Offered Fall. Instructor(s): Weissenberger.

**HUMA 330 COURTSHIP, LOVE AND MARRIAGE IN THE AGE OF CHIVALRY (3)**

Mapping German Culture. The literature of the High Middle Ages is the first since antiquity to probe the hazards and potentials of romance between men and women, as well as single-sex friendship and love. This course will show how the literary ideal of love emerged in a society that was torn apart by war and rivalry. The poems and stories we will read belong to the treasures of medieval literature from the German lands. Taught in English with a possible FLAC section. Cross-listed with GERM 330, MDST 335, SWGS 330. Limited enrollment. Offered Fall. Instructor(s): Westphal.

**HUMA 340 WALTER BENJAMIN: AESTHETICS, HISTORY, AND POLITICS (3)**

Mapping German Culture. Benjamin has been celebrated as a revolutionary Marxist, a theologian of Jewish Messianism, and as an essayist and literary critic. The course offers an introduction to his writings by way of situating them in the historical background of the Weimar Republic and the crises of European society on the eve of WWII. Taught in English with a possible FLAC section. Cross-listed with GERM 340. Not offered this academic year. Instructor(s): Steiner.

**HUMA 344 KOREAN LITERATURE AND CULTURE (3)**

Exploration of selections from modern Korean literature and watching Korean films. Includes background survey of Korean history, philosophy and religion. All texts and films in English translation. No previous knowledge of Korean required. Cross-listed with ASIA 344, KORE 344. Instructor permission required. Instructor(s): Han.

**HUMA 372 THE GERMAN FAIRY TALE: OLD AND NEW (3)**

Mapping German Culture. Discussion of several prototypes from the fairy-tale collection of the Brothers Grimm and the subsequent development of the "literary" fairy tale from Goethe and the Romantics to the 20th century. Taught in English. Cross-listed with GERM 326. Limited enrollment. Offered Fall. Instructor(s): Weissenberger.

**HUMA 373 NEW GERMAN CINEMA (3)**

Mapping German Culture. From the 1960 to 2000, Germany has developed a very distinct auteur cinema with independent filmmakers such as Fassbinder, Herzog, Wenders, Adlon, Trotta, Sander, Brueckner, Doerrie, Garnier, Tykwer, and others. The first 20 years of German film were oriented on coming to terms with the fascist past; the second 20 years focused on more contemporary issues. Film critical readings and class discussion in English. All films are subtitled in English and will be assessed with podium technology. Taught in English with a possible FLAC section. Cross-listed with GERM 338, SWGS 361. Limited enrollment. Not offered this academic year.

**ITAL (ITALIAN LANGUAGE AND CULTURE)****School of Humanities/Center for Study of Languages****ITAL 101 ELEMENTARY ITALIAN I: LANGUAGE AND CULTURE (4)**

In this course, designed for those with little or no knowledge of Italian, students start to build up indispensable skills: to communicate in Italian in everyday situations, to read a variety of texts, and to write clearly. Students will discover Italian culture through an interdisciplinary approach, which includes cinema, music (including live performance), newspaper articles and the web. Class work will be supplemented by the digital resources available on-line through the LRC. Recommended prerequisite(s): No prior knowledge of Italian. Limited enrollment.

**ITAL 102 ELEMENTARY ITALIAN II: LANGUAGE AND CULTURE (4)**

As a continuation of ITAL 101, the focus will be on spoken and written Italian. Students will continue to acquire fluency, reinforce the abilities to narrate, describe and compare through a wide variety of materials, including the digital resources available on-line through the LRC. Pre-requisite(s): ITAL 101 or permission of instructor. Limited enrollment.

**ITAL 201 INTERMEDIATE ITALIAN I: LANGUAGE AND CULTURE (4)**

This course is aimed at developing the essential skills of communication in Italian in a variety of situations. Students will take on intermediate level reading, and will be expected to write increasingly competent Italian employing advanced grammatical structures. We will also take into consideration a range of written material, including literary excerpts, film reviews, and mass media. The course work will be supplemented by the digital resources available on-line through the LRC. Pre-requisite(s): ITAL 101 and ITAL 102 or permission of instructor. Limited enrollment.

**ITAL 202 INTERMEDIATE ITALIAN II: LANGUAGE AND CULTURE (4)**

As a continuation of ITAL 201, we will continue to develop the skills required to communicate in Italian on an increasingly wide range of subjects. Students will acquire the ability to read more advanced literary texts, with a focus on contemporary literature and the short story. Digital materials for this course are made available through the LRC. Pre-requisite(s): ITAL 201 or permission of instructor. Limited enrollment.

**ITAL 222 AP CREDIT IN ITALIAN (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ITAL 223 AP CREDIT IN ITALIAN (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**ITAL 309 ITALY THROUGH CINEMA AND LITERATURE (3)**

This course will concentrate on Italian cinema and literature from c1950-present. Topics to be discussed include Neorealism, Feminism, 'Commedia all'italiana', and the Holocaust. Students will begin to express themselves in increasingly elegant written and spoken Italian. This course is supported by resources available through the LRC. Pre-requisite(s): ITAL 202 or permission of instructor.

## JAPA (JAPANESE)

### School of Humanities/Center for Study of Languages

#### **JAPA 101 INTRODUCTION TO JAPANESE LANGUAGE AND CULTURE I (5)**

Elementary Japanese emphasizes the learning of basic grammatical structures and vocabulary of modern Japanese to develop oral competence at the novice level. This goal is achieved primarily through aural-oral activities and task-oriented instruction. Students are expected to achieve the level of proficiency necessary to complete uncomplicated communicative tasks. Weekly tutorial required. Recommended prerequisite(s): No prior knowledge of Japanese. Limited enrollment. Offered Fall. URL: [lang.rice.edu/hsato/JapaCourse/JAPA101.html](http://lang.rice.edu/hsato/JapaCourse/JAPA101.html).

#### **JAPA 102 INTRODUCTION TO JAPANESE LANGUAGE AND CULTURE II (5)**

Continuation of JAPA 101. More focus on Kanji practice with the Japanese Writing System. Further practice on conversation skills with a task-oriented instruction to language to achieve necessary abilities to handle successfully for uncomplicated communicative tasks in Japanese. Weekly tutorial-session is required. Emphasis on development on cultural competence working on a project in group. Prerequisite(s): JAPA 101, or placement test or permission of instructor. Offered Spring. URL: [lang.rice.edu/hsato/JapaCourse/JAPA102.html](http://lang.rice.edu/hsato/JapaCourse/JAPA102.html).

#### **JAPA 201 INTERMEDIATE JAPANESE LANGUAGE AND CULTURE I (5)**

Further practice in conversation, grammar, reading and composition. Class will be conducted exclusively in Japanese. Students will be able to accomplish a variety of uncomplicated communicative tasks. More emphasis on kanji practice with the Japanese writing system. Participation in weekly tutorial session is required. Pre-requisite(s): JAPA 102, or placement test or permission of instructor. Limited enrollment. Offered Fall. URL: [lang.rice.edu/hsato/JapaCourse/JAPA201.html](http://lang.rice.edu/hsato/JapaCourse/JAPA201.html).

#### **JAPA 202 INTERMEDIATE JAPANESE LANGUAGE AND CULTURE II (5)**

Continuation of JAPA 201. Class will be conducted exclusively in Japanese. Proficiency-based instruction to language to achieve necessary abilities to handle successfully a variety of uncomplicated communicative tasks in Japanese. More emphasis on development of cultural competence in discussing in Japanese. Participation in weekly tutorial-session is required. Pre-requisite(s): JAPA 201, or placement test or permission of instructor. Limited enrollment. Offered Spring. URL: [lang.rice.edu/hsato/JapaCourse/JAPA202.html](http://lang.rice.edu/hsato/JapaCourse/JAPA202.html).

#### **JAPA 222 AP CREDIT IN JAPANESE LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

#### **JAPA 223 AP CREDIT IN JAPANESE LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

#### **JAPA 301 ADVANCED JAPANESE READING AND COMPOSITION I (3)**

Classes will be conducted in Japanese. Texts include a variety of subjects and topics including web-based texts created and developed by the instructor to sustain students' well-developed abilities and skills in Japanese. Reserved films and videos are included in the course as part of the text. Pre-requisite(s): JAPA 202, or placement test or permission of instructor. Limited enrollment. Offered Fall. URL: [lang.rice.edu/hsato/JapaCourse/JAPA301.html](http://lang.rice.edu/hsato/JapaCourse/JAPA301.html).

#### **JAPA 302 ADVANCED JAPANESE READING AND COMPOSITION II (3)**

Continuation of JAPA 301. Classes will be conducted in Japanese. Texts include a variety of subjects and topics including web-based texts created and developed by the instructor to sustain students' well-developed abilities and skills in Japanese. Students will work on a project for a presentation using Microsoft PowerPoint in Japanese. Pre-requisite(s): JAPA 301, or placement test or permission of instructor. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~hsato/japa302.html](http://www.ruf.rice.edu/~hsato/japa302.html).

#### **JAPA 370 STRUCTURE OF JAPANESE (3)**

This course examines current issues in Japanese grammar in the framework of contemporary linguistic theory. Where appropriate, the traditional kokogogaku approach is compared with modern linguistic approaches. Basic knowledge of both Japanese and linguistics is required. Cross-listed with LING 370. Pre-requisite(s): LING 200 and JAPA 202. Repeatable for Credit. Offered Fall.

#### **JAPA 398 JAPANESE TEACHING PRACTICUM (3)**

This course gives students with advanced proficiency in Japanese the opportunity to acquire teaching experience in the tutorial format. Includes regular meetings with supervising faculty member. Offered Fall.

#### **JAPA 399 JAPANESE TEACHING PRACTICUM (3)**

This course gives students with advanced proficiency in Japanese the opportunity to acquire teaching experience in the tutorial format. Includes regular meetings with supervising faculty member. Limited enrollment. Offered Spring.

**JAPA 425 JAPANESE FOR SCIENCE AND TECHNOLOGY (1)**

JAPA 425 is a course that integrates technology and language. Its main objective is to train students to become culturally well-equipped with knowledge both in science/technology and in Japanese language. The course will provide students with Japanese proficiency the opportunities to become knowledgeable in their research in all language skills. Instructor permission required. Limited enrollment. URL: [http://lang.nice.edu/hsato/NANO\\_JAPANESE/index.html](http://lang.nice.edu/hsato/NANO_JAPANESE/index.html).

**JAPA 498 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Offered Fall.

**JAPA 499 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Offered Spring.

**KINE (KINESIOLOGY)****School of Humanities/Kinesiology****KINE 100 WRITING FOR PROFESSIONAL COMMUNICATION (3)**

An intensive study of how to write prose for effective and successful professional communication. Students will participate in communication activities, in both business and professional settings, designed to improve oral presentations, writing, interviews, and negotiations. Instructor permission required. Limited enrollment. Not offered this academic year.

**KINE 120 SCIENTIFIC FOUNDATIONS OF KINESIOLOGY (3)**

An introduction to studies in the areas of human movement: anatomy and physiology, physiology of exercise, motor behavior, biomechanics and sport psychology. Instructor(s): Disch.

**KINE 205 SOCIOLOGY OF SPORT AND ETHICS (3)**

This course will explore power relations and cultural ideologies as they impact participation opportunities in sport, leisure, and exercise. Students will use in-dept critical thinking analysis to explore the links that exist between sport and the major spheres of social life. In addition, moral decision making and ethical dilemmas in sport, leisure, and exercise will be addressed.

**KINE 206 FIRST AID/EMERGENCY CARE/CPR (1)**

The American Red Cross certification program for emergency care procedures for illness, traumatic injuries, and cardiopulmonary resuscitation. Cross-listed with HEAL 206. Limited enrollment. Offered Spring. Instructor(s): Harwood.

**KINE 260 INTRODUCTION TO SPORT MANAGEMENT (3)**

Management theory and practice related to the sports industry. Offered Fall & Spring. Instructor(s): Sosa.

**KINE 276 SPORT MANAGEMENT PRACTICUM (3)**

This class is designed to prepare students for their internship. Students will learn how to construct an effective resume, interviewing skills, business etiquette, etc. Students will also gain real-life experience by working for the Houston Dynamo or Houston Aeros for 100 hours during the course of the semester. This course is also an advanced study of research and policy in sport management. There will be an emphasis on developing a solid working knowledge of the current literature that guides academic and governing leaders in sport management. Pre-requisite(s): KINE 260. Offered Fall & Spring. Instructor(s): Sosa.

**KINE 300 HUMAN ANATOMY (3)**

Introduction to human anatomy including concepts of function. Limited enrollment. Offered Fall & Spring.

**KINE 301 HUMAN PHYSIOLOGY (3)**

This course will address the fundamental principles of human physiology at the cell, tissue, organ, organ system, and organism levels. Emphasis will be placed on mechanisms of function and homeostasis as achieved through the coordinated function of homeostatic control systems. Limited enrollment. Offered Fall. Instructor(s): Gibson.

**KINE 302 BIOMECHANICS (3)**

An introduction to the discipline of mechanics as it applies to biological systems. Primary emphasis is placed on humans and other vertebrate species. Topics covered include the kinematics and kinetics of movement, material and functional properties of musculoskeletal tissues and the integration of musculoskeletal function from molecules and cells to whole animals. Pre-requisite(s): KINE 300 and PHYS 125. Recommended prerequisite(s): KINE 321. Offered Spring. Instructor(s): Weyand.

**KINE 310 PERFORMANCE PSYCHOLOGY (3)**

Applied study of how the mind influences performance in sport, medicine, business, music and the arts. Pre-requisite(s): KINE 260.

**KINE 311 MOTOR LEARNING (3)**

Physiological, neurological, and psychological factors affecting skill acquisition and development. Offered Fall. Instructor(s): Etnyre.

**KINE 319 INTRODUCTION TO MEASUREMENTS AND STATISTICS (3)**

Introduction to basic statistics, and elementary measurement theory with application to sport management, health sciences, and sports medicine. Offered Fall. Instructor(s): Disch.



**KINE 321 EXERCISE PHYSIOLOGY (3)**

This course examines the acute and chronic effects of exercise on physiological functions. Topics include nutrition, energy transfer, fatigue, metabolism, disease, aging, preventative medicine, genetics, elite performance, ergogenic aids, exercise testing, and specificity of training. Offered Spring. Instructor(s): Gibson.

**KINE 323 EXERCISE PHYSIOLOGY LABORATORY (3)**

This course introduces the concepts and assessment techniques used to quantify physiological function. Laboratory experiences will require students to acquire and apply knowledge of systems physiology to make direct functional assessments using themselves as subjects. A major emphasis will be placed on metabolism and energy transfer in the body. Cardiovascular, musculoskeletal, and central nervous system function will also be covered. Individual body composition, musculoskeletal levers, metabolic power and fitness, and neuromuscular control and coordination. Pre-requisite(s): KINE 300 and KINE 301 and KINE 321. Limited enrollment. Offered Spring. Instructor(s): Weyand.

**KINE 325 MOTOR LEARNING LAB (1)**

Laboratory experiences in the physiological, neurological and psychological factors of human movement. Corequisite(s): KINE 311. Offered Fall. Instructor(s): Etnyre.

**KINE 341 MANAGEMENT OF CHRONIC DISEASES (3)**

Topics include the diagnosis, prevention and treatment of chronic disease from cardiac pathologies to obesity. Offered Fall.

**KINE 351 HUMAN ANATOMY LAB (1)**

Study of the pro-sections and interactive computer instructional methodology are used for learning and understanding human anatomy in a gross anatomy examination laboratory at Texas Women's University in the Texas Medical Center. Hands-on examination of human anatomy in this course provides supplemental practical experience for lectures in KINE 300, Human Anatomy courses. Must be enrolled in one of the following Major(s): Kinesiology. Pre-requisite(s): KINE 300. Limited enrollment. Offered Spring.

**KINE 360 SALES AND REVENUE GENERATION IN SPORT (3)**

In this class, students are introduced to the characteristics that are required for successful selling in the sports industry, such as developing proposals, making persuasive sales presentations, closing deals, maintaining relationships, etc. Students will also explore the various ways that revenue is generated in the sports industry. Pre-requisite(s): KINE 260. Offered Fall & Spring.

**KINE 362 SPORT MARKETING AND PROMOTION (3)**

The role of communication media from print to broadcast in the business of sport, sales, marketing, and promotion will be considered at the amateur, collegiate, and professional sports levels, as well as in fitness, apparel, and commercial sport industry. Pre-requisite(s): KINE 260. Offered Fall & Spring. Instructor(s): Haptonstall.

**KINE 364 SPORTS LAW AND LABOR RELATIONS (3)**

Study of legal principles, antitrust regulation, and labor law in the sport industry. Contracts, monopolies, business structure, and negotiation will be included. Pre-requisite(s): KINE 260. Offered Fall.

**KINE 366 EVENT AND FACILITY MANAGEMENT (3)**

Practical application of the principles and theory related to planning, organization, and execution of sport and entertainment events. Fund raising and charity management will be considered, as will the management of small and large scale facilities and event venues. At the conclusion of this course, students will be prepared to design, run, and evaluate events and event management teams. Prerequisite(s): KINE 260. Offered Fall & Spring.

**KINE 368 ISSUES IN CONTEMPORARY SPORT (3)**

Social institution of sport and its consequences for American Society social organizations from leisure to professional sport; violence, discrimination, women in sport; socialization implications from participation in sports. Pre-requisite(s): KINE 260. Offered Fall & Spring. Instructor(s): Sosa.

**KINE 375 SPORTS MEDICINE INTERNSHIP (1 TO 3)**

Internship experience for senior students in sports medicine track. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Weyand.

**KINE 376 SPORT MANAGEMENT INTERNSHIP I (3 TO 6)**

Internship experience for upper level students in sport management. Pre-requisite(s): KINE 260 and KINE 276 and KINE 276. Repeatable for Credit. Offered Fall & Spring.

**KINE 377 SPORT MANAGEMENT INTERNSHIP II (3 TO 6)**

Continued internship experience for upper level students in sports management. Pre-requisite(s): KINE 260 and KINE 276 and KINE 276. Repeatable for Credit. Offered Fall & Spring.

**KINE 405 RESEARCH IN SPORT MANAGEMENT (3)**

Designed to provide students with experience working on a real research project(s) with one of the professional sports franchises in Houston. The project(s) will involve marketing research and/or a statistical analysis of player performance and its predictors. At the end of the semester, the class will present its findings to the organization's upper management. Pre-requisite(s): KINE 260 and KINE 319 or STAT 280. Offered Fall & Spring. Instructor(s): Disch.

**KINE 410 CASE STUDIES IN PERFORMANCE ENHANCEMENT (3)**

An advanced, multidisciplinary consideration of how humans pursue excellence. Class work will center around problem solving using a case study methodology. Limited enrollment. Offered Fall.

**KINE 412 MOTOR CONTROL (3)**

Exploration of the neuro-physiological, behavioral, and biomechanical aspects of human movement and development. Offered Spring. Instructor(s): Etnyre.

**KINE 421 HUMAN PERFORMANCE FROM DARWIN AND NEWTON TO DRUGS AND GENES (3)**

The course explores the ultimate limitations to physical performance co-imposed by the natural laws that govern the physical world and the functional and mechanical properties of the biological tissues involved in movement. Topics considered include: speed, strength, power and endurance. Examples are drawn from extreme performers, both human and animal, to identify the functional limits of the musculoskeletal and cardiovascular systems brought about by evolution. The class involves reading original research articles and is conducted in seminar format. Pre-requisite(s): KINE 321 or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Weyand.

**KINE 440 RESEARCH METHODS (3)**

Designed to introduce students to research methods, statistical techniques, and topics appropriate for experimental research. Pre-requisite(s): KINE 319. Instructor(s): Disch.

**KINE 441 MUSCLE PHYSIOLOGY AND PLASTICITY (3)**

This course will specifically address cardiac and skeletal muscle physiology and plasticity when introduced to various stimuli. These stimuli include exercise, aging, injury, altitude, microgravity, heat, and pharmacological agents. An emphasis will be placed on practical application to health, disease, and performance enhancement. Limited enrollment. Offered Fall. Instructor(s): Sharp.

**KINE 460 MANAGEMENT AND LEADERSHIP IN SPORTS (3)**

An advanced study of research and policy in sport management. Emphasis will be developing a solid working knowledge of the current literature that guides academic and governing leaders in sport management. Pre-requisite(s): KINE 260. Offered Fall & Spring. Instructor(s): Sosa.

**KINE 466 MEDIA RELATIONS AND PR (3)**

An applied study of media in business and sport with emphasis on press conferencing, news release, media-athlete relations, print journalism, television contracts, and public relations. Pre-requisite(s): KINE 260 and KINE 362. Offered Fall & Spring. Instructor(s): Haptonstall.

**KINE 490 SEMINAR IN SPORTS MEDICINE: SPORTS NUTRITION (3)**

Considers issues related to athletic injury including mechanisms, assessment, management, and rehabilitation. Limited enrollment. Offered Spring.

**KINE 495 INDEPENDENT STUDY (3)**

Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Fall. Instructor(s): Disch.

**KINE 496 INDEPENDENT STUDY (3)**

See KINE 495. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Spring. Instructor(s): Disch.

**KINE 498 SPECIAL TOPICS (1 TO 4)**

Repeatable for Credit. Offered Fall & Spring.

**KINE 499 TEACHING PRACTICUM (1 TO 3)**

Advanced teaching experience for upper level students who have demonstrated particular aptitude and interest in one area of kinesiology. Students will assist in conducting a course in which they have previously excelled. The student will learn techniques in course management, instruction, and evaluation. Department permission required. Recommended prerequisite(s): Junior or senior standing, declared major in Kinesiology, and at least an "A-" in the course serving as the practicum. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Etnyre.

**KORE (KOREAN)****School of Humanities/Center for Study of Languages****KORE 101 INTRODUCTION TO KOREAN LANGUAGE AND CULTURE I (5)**

Introduction to Korean language and culture. Acquisition of the fundamentals of the four language skills. Recommended Prerequisite(s): No prior knowledge of Korean. Limited enrollment.

**KORE 102 INTRODUCTION TO KOREAN LANGUAGE AND CULTURE II (5)**

Continuation of KORE 101. Pre-requisite(s): KORE 101 or permission of instructor. Limited enrollment.

**KORE 201 INTERMEDIATE KOREAN LANGUAGE AND CULTURE I (4)**

Continuation of the development of speaking, listening, reading, and writing skills. Pre-requisite(s): KORE 102 or permission of instructor. Limited enrollment.

**KORE 202 INTERMEDIATE KOREAN LANGUAGE AND CULTURE II (4)**

Development of intermediate language skills, conversation, and composition. Pre-requisite(s): KORE 201 or permission of instructor. Limited enrollment.

**KORE 301 SELECTED READINGS AND TRANSLATION I (3)**

Continuation of KORE 202. The course is designed for the development of advanced readings and translation. It aims to improve understanding of the usage of Korean language and its cultural roots through reading and interpreting short literary and non-literary pieces from various sources. The readings are primarily in Korean, with a few in English. Pre-requisite(s): KORE 202 or permission of instructor. Limited enrollment.

**KORE 302 SELECTED READINGS AND TRANSLATION II (3)**

It aims to strengthen in reading and writing in Korean. The text will include various subjects and topics. In addition, students will do a project that demonstrates aspects of Korean culture, primarily based on the accumulated readings and writings in class. Pre-requisite(s): KORE 301 or permission of instructor. Limited enrollment.

**KORE 344 KOREAN LITERATURE AND CULTURE (3)**

Exploration of selections from modern Korean literature and Korean films. Includes background survey of Korean history, philosophy, and religion. All texts and films in English translation. No previous knowledge of Korean required. Cross-listed with ASIA 344, HUMA 344. Instructor permission required.

**KORE 345 LINGUISTIC STRUCTURE OF KOREAN AND RELATED LANGUAGES IN EAST ASIA (3)**

Focuses on the origin of Korean and related languages. It explores the way the Korean language evolved and interacted with the other East Asian languages, including Chinese and Japanese. The sociolinguistic aspect of these languages will be studied, including the difference in male and female language usage and honorific systems. Cross-listed with ASIA 345, LING 345.

**KORE 346 KOREAN CULTURE AND SOCIETY THROUGH MULTIMEDIA (3)**

This course will introduce important elements of Korean culture and society through readings and multimedia. Topics are in the areas of history, philosophy, and family life around the early 20th century to the present. Also, the class will explore the recent phenomenon of "Korean Wave" in East Asia. Korean background is unnecessary. Cross-listed with ASIA 346. Limited enrollment.

**KORE 398 KOREAN TEACHING PRACTICUM (2 TO 3)**

Under the instructor's close supervision, students with a high level of proficiency in Korean acquire teaching skills by tutoring the students in lower level. Instructor permission required. Repeatable for Credit.

**KORE 399 KOREAN TEACHING PRACTICUM (2 TO 3)**

Under the instructor's close supervision, students with a high level of proficiency in Korean acquire teaching skills by tutoring the students in lower level. Instructor permission required. Repeatable for Credit. Offered Spring.

**KORE 499 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required.

**LATI (LATIN)****School of Humanities/Classical Studies****LATI 101 ELEMENTARY LATIN I (3)**

Study of the fundamentals of Latin grammar with emphasis on acquisition of reading skill. Cross-listed with MDST 101. Offered Fall. Instructor(s): Widzisz.

**LATI 102 ELEMENTARY LATIN II (3)**

Continuation of LATI 101. Cross-listed with MDST 102. Pre-requisite(s): LATI 101. Offered Spring. Instructor(s): Widzisz.

**LATI 104 AP CREDIT IN ELEMENTARY LATIN (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**LATI 201 INTERMEDIATE LATIN I: PROSE (3)**

Review of grammar and readings in Latin prose. Cross-listed with MDST 211. Pre-requisite(s): LATI 101 and LATI 102. Offered Fall. Instructor(s): Yunis.

**LATI 202 INTERMEDIATE LATIN II (3)**

Reading in Virgil. Cross-listed with MDST 212. Pre-requisite(s): LATI 201. Offered Spring. Instructor(s): Yunis.

**LATI 204 AP CREDIT IN INTERMEDIATE LATIN (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**LATI 301      ADVANCED LATIN: LITERATURE OF EXILE IN THE ROMAN TRADITION (3)**

An examination of Latin works on exile, both prose and poetry. We will explore the actual circumstances on exile in ancient Rome, the consolation tradition and exile, relations between exile poetry and elegy, and how exile affected Roman notions of cultural and individual identity. Authors include Cicero, Ovid, and Seneca. Not offered this academic year. Instructor(s): McGill.

**LATI 302      ADVANCED LATIN (3)**

We will read Propertius' elegies with a view to understanding the poetics of Latin love elegy and the relationship of this genre to its social context. Not offered this academic year. Instructor(s): Mackie.

**LATI 303      ADVANCED LATIN: PLAUTUS AND TERENCE (3)**

We will read, Plautus, Pseudolus, Terence, and Adelphoe. We will consider the background of Greek comedy and the contemporary social situation in Rome. Not offered this academic year.

**LATI 311      LATIN PASTORAL POETRY (3)**

Survey of Latin pastoral, with its idyllic country sides, singing shepherds, and lovely laments. Readings drawn from Virgil's Eclogues, Calpurnius, Siculus, Nemesianus, and early Christian pastoral. Principal focus will be stylistic and thematic aspects of individual poets. Later history of pastoral, particularly in English tradition, will also be examined. Not offered this academic year. Instructor(s): McGill.

**LATI 312      OVID: AMORES (3)**

Selections from Ovid's Amores, love poetry more about poetry than about love. Emphasis will lie on close translation and close interpretation of the poems. Offered Fall. Instructor(s): McGill.

**LATI 313      CICERO AND CATULLUS: LITERATURE AND SOCIETY IN THE ROMAN REPUBLIC (3)**

We will read Cicero's Pro Caelio and several of Catullus' longer poems as a vehicle for understanding politics and culture in the late Roman Republic. Not offered this academic year. Instructor(s): McGill.

**LATI 314      TACITUS (3)**

Selections from the Roman historian Tacitus. We will focus on Tacitean style, his historiographical methods, his cultural and political milieu, and the political color of his work. Not offered this academic year. Instructor(s): McGill.

**LATI 315      SENECA TRAGEDY (3)**

Selections from the tragedies of Seneca, some of the wittiest and goriest poetry to survive from the antiquity. Topics will include Senecan style, the performance contexts of his plays, the history of Roman tragedy, and Seneca's legacy in Literary history. Offered Spring. Instructor(s): McGill.

**LATI 491      DIRECTED READING (3)**

Independent work for qualified juniors and seniors in genres or authors not presented in other upper level courses. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Fall.

**LATI 492      DIRECTED READING (3)**

Independent work for qualified juniors and seniors in genres or authors not presented in other upper level courses. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit. Offered Spring.

**LEAD (LEADERSHIP RICE)****No College Designated/Leadership Rice****LEAD 309      LEADERSHIP: THEORY TO PRACTICE (3)**

LEAD 309 offers an opportunity to understand and grow the capacities associated with leadership. The class combines theory and practice with added emphasis on learning how to build and sustain a powerful team. This course is required for a Leadership Rice mentorship or the Leadership Certificate. Offered Fall. URL: [www.ruf.rice.edu/~leading/leaderpages/univ309.html](http://www.ruf.rice.edu/~leading/leaderpages/univ309.html). Instructor(s): Murray; Ksiezzyk.

**LEAD 310      LEADERSHIP CERTIFICATE SEMINAR (1 TO 3)**

This series of special topic seminars explores leadership development in more depth. Students should come away with a better sense of how to impact their communities and construct a more authentic life. Open to students accepted into or interested in the Leadership Certificate Program. Pre-requisite(s): UNIV 309 or LEAD 309. Repeatable for Credit. Offered Spring. URL: [www.ruf.rice.edu/~leading/leaderpages/courses.html](http://www.ruf.rice.edu/~leading/leaderpages/courses.html). Instructor(s): Ksiezzyk; Murray.

**LEAD 311      CREATIVITY SEMINAR (1)**

The purpose of this seminar is to deepen understanding of the creative process and explore ways in which individuals can mine their creative capacity. In addition to minor weekly assignments, participants will design a creative major project that grows, develops, and explores one's own creative interests. Offered Spring. Instructor(s): Murray.

**LEAD 313      ENTREPRENEURIAL LEADERSHIP (2)**

An entrepreneur is a person who perceives an opportunity and creates an organization to pursue it. This course is about attitudes, attributes, and skills that contribute to successful entrepreneurship, both in the profit and non-profit realms. Students must have some professional work experience to participate. Offered Fall. URL: [www.ruf.rice.edu/~leading/leaderpages/univ313.html](http://www.ruf.rice.edu/~leading/leaderpages/univ313.html). Instructor(s): Murray; Ferguson.

**LEAD 320 RHETORIC OF LEADERSHIP (1)**

This course explores the ethical implications of leadership and includes: a presentation of main approaches to ethics; class discussion of the ethical dimensions of the concept "leader"; and a series of case studies. Offered Spring. Instructor(s): Garrett.

**LEAD 321 LEADERSHIP COMMUNICATION (3)**

Leadership Communication provides an introduction to leadership communication with an emphasis on the core communication capabilities needed to be an effective leader. The course will provide instruction and practice in written and spoken individual and team communication and allow students the opportunity to develop the important interpersonal skills they need to communicate in diverse professional contexts and across different cultures. This course is designed for upper level students and satisfies the prerequisite for the Leadership Rice Summer Mentorship. Offered Fall. Instructor(s): Worth.

**LEAD 375 THE SOCIAL DYNAMICS OF LEADERSHIP: ELITES AND SOCIETY (3)**

This course explores the rise, reign, and fall of leading groups in human societies (the powerful, the influential, the celebrated, the stars) with emphasis on the contemporary United States. Particular themes to be addressed include power, wealth, fame, and status as well as leadership failures, moral dilemmas, and issues of accountability. Cross-listed with SOCI 375. Limited enrollment. Instructor(s): Lindsay.

**LEAD 409 LEADERSHIP PRACTICUM (1)**

LEAD 409 is required for students serving as teaching assistants for LEAD 309 during the fall. Practical leadership skills are developed in the classroom and in practice while serving as facilitators for team building and team projects in LEAD 309. Pre-requisite(s): UNIV 309 or LEAD 309. Repeatable for Credit. Offered Fall. Instructor(s): Ksiezyk.

**LING (LINGUISTICS)****School of Humanities/Linguistics****LING 105 LANGUAGE, GENDER, AND SEXUALITY (3)**

This course examines the role that gender, biological sex, and sexuality play in the language varieties that people use. We will see that although all cultures have specified gender roles, and all cultures mark gender through language varieties, those differences are not, I promise, what you think they are. Cross-listed with FSEM 105. Limited enrollment. Not offered this academic year. Instructor(s): Niedzielski.

**LING 200 INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE (3)**

Overview of the scientific study of the structure and function of language. Introduces the main fields of linguistics: phonetics, phonology, morphology, syntax, semantics, discourse, historical linguistics, sociolinguistics, and psycholinguistics. Highlights the interdisciplinary relationship of linguistics with anthropology, sociology, psychology, and cognitive sciences. Cross-listed with ANTH 200. Offered Fall & Spring.

**LING 205 LANGUAGE AND SOCIETY (3)**

This course treats language as a social phenomenon to show how language, personal identity and institutions of social control inter-relate. The course focuses on linguistic interaction in daily life and how gender, ethnic, class, activity and geographic variation affect language use. Cross-listed with SWGS 205. Offered Fall. Instructor(s): Taylor.

**LING 212 SPEECH AND HEARING SCIENCE (3)**

This course will describe the basics of speech and hearing science, including but not limited to: anatomy and physiology of speech and hearing mechanisms, neural pathways involved in speech and hearing, speech pathology and audiology, types of speech and hearing disorders, their causes, and types of therapies available for the remediation of these disorders. Pre-requisite(s): LING 200 or ANTH 200. Not offered this academic year.

**LING 215 WORDS IN ENGLISH: STRUCTURE, HISTORY, USE (3)**

Introduction to the study of English words, focusing on their internal structure and the nature and history of English vocabulary. Aims are to enhance knowledge of the rich lexical resources of the language and to facilitate the acquisition of scientific, technical, legal, and humanistic vocabulary. No previous linguistics background required. Cross-listed with ENGL 215. Offered Fall. Instructor(s): Kemmer.

**LING 300 LINGUISTIC ANALYSIS (3)**

A hands-on, data-oriented approach to how different languages construct words and sentences. Students will develop skills in linguistic problem solving and the foundations for pursuing grammatical description. Topics: word classes, morphology, tense-aspect-modality, clause structure, word order, grammatical relations, existentials/possessives/locatives, voice/valence, questions, negation, relative clauses, complements, causatives. Cross-listed with ANTH 300. Graduate/Undergraduate version: LING 500. Pre-requisite(s): LING 200 or ANTH 200. Offered Fall. Instructor(s): Englebretson.

**LING 301 PHONETICS (3)**

Introductory study of sound as it relates to speech and sound systems in the world's languages. Speech sounds are examined in terms of production mechanisms (articulatory phonetics), propagation mechanisms (acoustic phonetics), and perception mechanisms (auditory phonetics). Includes a basic introduction to Digital Signal Processing. Cross-listed with ANTH 301. Graduate/Undergraduate version: LING 501. Pre-requisite(s): LING 200. Offered Fall. Instructor(s): Niedzielski.

**LING 304 INTRODUCTION TO SYNTAX (3)**

An introduction to syntactic analysis and argumentation. Various topics will be covered, including (but not limited to) word classes, grammatical categories, simple and complex sentences, and constituency. Graduate/Undergraduate version: LING 504. Pre-requisite(s): LING 300. Offered Spring. Instructor(s): Achard

**LING 305 HISTORICAL LINGUISTICS (3)**

Exploration of the nature of language change. Topics covered include sound change, syntactic and semantic change, modeling language splits, the sociolinguistics of language change, and the history of European languages. Cross-listed with ANTH 305. Graduate/Undergraduate version: LING 505. Prerequisite(s): (LING 300 and LING 311) or (ANTH 300 and ANTH 311). Not offered this academic year. Instructor(s): Bowers.

**LING 306 LANGUAGE, THOUGHT, AND MIND (3)**

Study of language as a cognitive system. Linguistic data as evidence for the cognitive structures and processes that enable people to learn and use language; how linguistic structure influences concept formation and patterns of thinking. Graduate/Undergraduate version: LING 506. Pre-requisite(s): LING 200 or LING 300. Offered Fall. Instructor(s): Achard.

**LING 309 PSYCHOLOGY OF LANGUAGE (3)**

Study of human and other animal communication. Cross-listed with PSYC 309. Offered Spring.

**LING 310 MORPHOLOGY (3)**

Morphology is the study of word formation and the relationship between form, meaning, and syntax. This course is an introduction to morphological theory. Topics covered include approaches to word formation, morphological change, and morphological phenomena in diverse languages. Graduate/Undergraduate version: LING 510. Pre-requisite(s): LING 300 and LING 311. Not offered this academic year. Instructor(s): Bowers.

**LING 311 INTRODUCTION TO PHONOLOGY (3)**

Introduction to analysis techniques and theory concerning patternings of sounds in the world's languages. The course will involve extensive work with non-English data sets, and development of analytical techniques such as identification of sound alternations or restrictions, and formalization of abstract representations and rules to account for them. Cross-listed with ANTH 323. Pre-requisite(s): LING 200 or LING 301. Offered Spring. Instructor(s): Crosswhite

**LING 313 LANGUAGE AND CULTURE (3)**

Investigation of the relation between language and thought, language and worldview, and language and logic. Cross-listed with ANTH 313. Graduate/Undergraduate version: LING 513. Not offered this academic year. Instructor(s): Tyler.

**LING 314 SECOND LANGUAGE ACQUISITION (3)**

This course surveys and critiques various theories of second language acquisition. Major topics are: analysis of linguistic, cognitive and social processes in the development of second languages, formal hypothesis of non-academic and classroom L2 learning, analysis of various SLA research methodologies and interpretation of findings from SLA research. Limited enrollment. Not offered this academic year. Instructor(s): Achard.

**LING 315 INTRODUCTION TO SEMANTICS (3)**

Introduction to basic approaches to the study of meaning in linguistics and related fields. Includes the cognitive representation of meaning, lexical categorization, conceptual structures, metaphor/metonymy, meaning change, pragmatic inference, and the relation of language and mind. Cross-listed with PSYC 315. Graduate/Undergraduate version: LING 515. Pre-requisite(s): LING 200. Offered Fall. Instructor(s): Kemmer.

**LING 318 STRUCTURE OF FRENCH (3)**

The primary objective of this course is to present contemporary French as a dynamic linguistic system shaped by historical, cognitive and sociological developments. Beyond the specific consideration of French, this course is concerned with the historical, psychological, and sociological dimensions that enter into the description of any language. Cross-listed with FREN 318. Pre-requisite(s): FREN 202, or placement test. Offered Fall. Instructor(s): Achard.

**LING 320 ORIGINS AND EVOLUTION OF HUMAN LANGUAGE (3)**

How did Human Language arise, and what role did language play in the evolution of our species? This course introduces the basic sources of evidence (e.g., fossil remains, comparative primatology, neonatal development) for knowledge of human linguistic prehistory, including the spread of modern humans and human language throughout the world. Not offered this academic year. Instructor(s): Kemmer.

**LING 321 STRUCTURE OF CHINESE: SYNTAX & SEMANTICS (3)**

Examination of syntactic and semantic features of Chinese with special attention to contrastive analysis of selected topics of Chinese and English, including expressions of tense and aspect, conditional and counterfactual, word formation (morphology), the notion of syntactic category, grammaticalization, etc. Taught in English. Cross-listed with CHIN 321. Limited enrollment. Not offered this academic year.

**LING 322 LANGUAGE AND ETHNICITY (3)**

This course explores the role that ethnicity plays in various language varieties used in the U.S., and the role that language varieties play in ethnic identity. We examine this from both speech production and speech perception perspectives. Pre-requisite(s): LING 205. Limited enrollment. Not offered this academic year. Instructor(s): Niedzielski.

**LING 325 LANGUAGE ACQUISITION (3)**

This course focuses on some of the central aspects of first language acquisition. Topics include statistical learning; the use of special kinds of input modification ('motherese'); how children's grammatical, lexical-semantic, and phonological systems develop; the critical period hypothesis; and language development in the absence of a conventional model ('home sign'). Cross-listed with PSYC 325. Graduate/Undergraduate version: LING 525. Instructor(s): Franklin.

**LING 330 CORPUS LINGUISTICS (3)**

Investigation of the nature of linguistic representations from corpus-based analyses as compared to more traditional methodologies. Includes the collection of individual text data (or the exploration of existing text sources), the use of various text analysis programs (e.g. concordance software), and the production of lexical, syntactic, semantic, discourse, or cultural analyses of selected texts, using computer-based methods. Graduate/Undergraduate version: LING 530. Not offered this academic year.

**LING 340 THEORY AND METHODS OF TEACHING ESL (3)**

Introduction to the theory and practice of teaching a second language. Includes the process of language learning viewed from social, psychological, and linguistic perspectives, as well as commonly used teaching "methods," such as the audio-lingual method, situational language teaching, the natural approach, and TPR, among others. Graduate/Undergraduate version: LING 540. Not offered this academic year.

**LING 345 LINGUISTIC STRUCTURE OF KOREAN (3)**

The course focuses on the origin of Korean and related languages. It explores the way the Korean language evolved and interacted with other East Asian Languages, including Chinese and Japanese. The sociolinguistic aspect of these languages will be studied, including the difference in male and female language used and the honorific systems. Cross-listed with ASIA 345, KORE 345. Not offered this academic year. Instructor(s): Lee.

**LING 370 STRUCTURE OF JAPANESE (3)**

This course examines current issues in Japanese grammar in the framework of contemporary linguistic theory. Where appropriate, the traditional kokugogaku approach is compared with modern linguistic approaches. Basic knowledge of both Japanese and linguistics is required. Cross-listed with JAPA 370. Pre-requisite(s): LING 200 and JAPA 202. Repeatable for Credit. Not offered this academic year. Instructor(s): Shibatani.

**LING 394 STRUCTURE OF THE ENGLISH LANGUAGE (3)**

Introduction to modern English grammar, phonology, and semantics. Cross-listed with ENGL 394. Offered Spring.

**LING 395 HISTORY OF THE ENGLISH LANGUAGE (3)**

Survey of 6,000 years of language history. Includes the phonological, morphological, syntactic, and semantic history of the English language from its Indo-European origins, through the Anglo-Saxon and Middle English periods, and up to the present day. Cross-listed with ENGL 395. Not offered this academic year.

**LING 396 PROFESSIONS IN THE SPEECH SCIENCES (2)**

Students will attend a series of presentations by Houston area speech and hearing professionals who will discuss their current research and/or clinical focus. Students will also research career paths in the speech sciences. Repeatable for Credit. Not offered this academic year. Instructor(s): Crosswhite.

**LING 403 FOUNDATIONS OF LINGUISTICS (3)**

The foundations of important linguistic ideas and currents in the classic work of 19th and 20th century linguists, with reference to their influence on modern theories. Includes discussion of the Neogrammarians, Saussure, Sapir, Jespersen, Bloomfield, Whorf, and American and European structuralists. Taught as a pro-seminar. Offered Spring. Instructor(s): Kemmer.

**LING 404 RESEARCH METHODOLOGY AND LINGUISTIC THEORIES (3)**

Compares and explores the nature of data, argumentation, goals, and assumptions of current theoretical approaches to language and linguistics. Centers on the discussion of general readings and source articles from cognitive, generative, typological, discourse-functional, and sociolinguistic orientations. Emphasizes critical thinking and awareness of the potential benefits and drawbacks of each approach. Pre-requisite(s): LING 300. Not offered this academic year. Instructor(s): Englebretson.

**LING 405 DISCOURSE (3)**

An overview of features and organization of language-in-use. Examination of the macro-structure of different genres of discourse, the interplay between language and social/cultural interaction, and the role of discourse and communication in motivating and shaping grammatical form. Pre-requisite(s): LING 300. Repeatable for Credit. Offered Fall. Instructor(s): Englebretson.

**LING 406 COGNITIVE STUDIES (3)**

Relations between thought, language, and culture. Special emphasis given to natural systems of classification and their underlying logical principles. Cross-listed with ANTH 406. Not offered this academic year. Instructor(s): Tyler.

**LING 407 LINGUISTIC FIELD METHODS (5)**

Techniques and practice in the observation, analysis, and recording of a human language. Cross-listed with ANTH 407. Recommended prerequisite(s): LING 300, LING 301, LING 304. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Niedzielski.

**LING 408 LINGUISTIC FIELD METHODS (5)**

Observation, analysis and recording of a human language. Focus on morpho-syntactic description. Cross-listed with ANTH 408. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Kemmer.

**LING 409 SPECIAL TOPICS (3)**

Course content varies from year to year. Repeatable for Credit. Offered Fall & Spring.

**LING 410 RHETORIC (3)**

Overview of classical series of rhetoric and followed by more intensive discussions both of contemporary theories and applications in a wide variety of disciplines. Cross-listed with ANTH 412. Offered Spring. Instructor(s): Tyler.

**LING 411 NEUROLINGUISTICS (3)**

Study of language and the brain. Includes localization of speech, language, and memory functions, hemispheric dominance, pathologies of speech and language associated with brain damage, and hypotheses of the representation and operation of linguistic information in the cortex. Cross-listed with ANTH 411. Not offered this academic year. Instructor(s): Lamb.

**LING 413 APPROACHES TO SYNTAX (3)**

Syntactic analysis may be studied from a variety of both generative and functional approaches. In this course, students are introduced to different approaches to theoretical syntax. Topics covered will vary from year to year according to the wishes and background of the students but will include analysis of different syntactic phenomena in LFG, GB/Minimalism, and comparison with functional approaches. Prerequisite(s): LING 300 and LING 304. Not offered this academic year. Instructor(s): Bowers.

**LING 414 HERMENEUTICS AND LINGUISTIC ANTHROPOLOGY (3)**

Application of linguistic theory and method in the analysis of cultural materials. Includes discourse analysis and the structure and interpretation of texts and conversation. Cross-listed with ANTH 414. Offered Fall. Instructor(s): Tyler.

**LING 415 SOCIOLINGUISTICS (3)**

Topic: Issues of language and gender, race and class. The course will begin with an overview of contemporary sociolinguistic theory and methodologies. We will then examine the linguistic consequences to speakers of their membership in groups defined in terms of gender, race, and class. Cross-listed with SWGS 415. Pre-requisite(s): LING 301 or LING 311 or LING 501 or LING 511. Not offered this academic year. Instructor(s): Niedzielski.

**LING 416 LANGUAGE UNIVERSALS AND TYPOLOGY (3)**

Investigation of what human languages have in common and a range of ways in which they can differ. Includes marking patterns in particular linguistic domains (e.g., case marking, animacy, and passives) and theoretical and methodological issues. Pre-requisite(s): LING 304. Offered Spring. Instructor(s): Shibatani.

**LING 419 BILINGUALISM (3)**

This course analyzes bilingualism from a variety of perspectives including cognitive, linguistic, and sociocultural viewpoints. Topics to be covered include conceptual representations of the lexicon, sentence parsing, levels of activation of bilingual modes, lexical, phonological, syntactic, and pragmatic interference, code-switching, cultural identity, bilingual education, language and thought, etc. Cross-listed with SPAN 440. Not offered this academic year. Instructor(s): Achard.

**LING 425 AUSTRALIAN LANGUAGES (3)**

A course on the structure of Australian languages examining the phonological, morphological, and syntactic systems. Emphasis placed on interaction with original data and making appropriate typological generalizations. Discussion of sociolinguistics, language use, language death, and revitalization. Cross-listed with ANTH 421. Not offered this academic year. Instructor(s): Bowers.

**LING 427 ADVANCED PHONOLOGY (3)**

Examination of issues in contemporary phonological theory. Special attention will be given to more advanced representational theories (feature geometry, moraic phonology) and phonetically motivated phonological analysis, especially within the framework of optimality theory. Pre-requisite(s): LING 301 and LING 311. Offered Spring. Instructor(s): Crosswhite.

**LING 428 LABORATORY PHONOLOGY (3)**

This course will examine phonetic and phonological phenomena from an empirical point of view, placing priority on first-hand acoustic or experimental data. The primary goal will be the investigation of theoretical issues in the areas of phonetic processing, lexical representation, and phonological patterning. A secondary goal is familiarity with laboratory techniques. Pre-requisite(s): LING 301 and LING 311. Not offered this academic year. Instructor(s): Crosswhite.

**LING 480 INDEPENDENT STUDY (1 TO 6)**

Instructor permission required. Repeatable for Credit.

**LING 481 UNDERGRADUATE RESEARCH (1 TO 6)**

Instructor permission required. Repeatable for Credit.

**LING 482 HONORS PROJECT (3)**

Independent directed research toward preparation of an undergraduate honors project or thesis. Instructor permission required. Repeatable for Credit.



- LING 500 LINGUISTIC ANALYSIS (3)**  
Cross-listed with ANTH 500. Graduate/Undergraduate version: LING 300. Offered Fall. Instructor(s): Englebretson.
- LING 501 PHONETICS (3)**  
Cross-listed with ANTH 501. Graduate/Undergraduate version: LING 301. Offered Fall. Instructor(s): Niedzielski.
- LING 504 INTRODUCTION TO SYNTAX (3)**  
Graduate/Undergraduate version: LING 304. Pre-requisite(s): LING 500. Offered Spring. Instructor(s): Achard.
- LING 505 HISTORICAL LINGUISTICS (3)**  
Cross-listed with ANTH 505. Graduate/Undergraduate version: LING 305. Not offered this academic year. Instructor(s): Bowern.
- LING 506 LANGUAGE, THOUGHT, AND MIND (3)**  
Graduate/Undergraduate version: LING 306. Offered Fall. Instructor(s): Achard.
- LING 510 MORPHOLOGY (3)**  
Graduate/Undergraduate version: LING 310. Not offered this academic year. Instructor(s): Bowern.
- LING 511 INTRODUCTION TO PHONOLOGY (3)**  
Cross-listed with ANTH 523. Offered Spring. Instructor(s): Crosswhite.
- LING 513 LANGUAGE AND CULTURE (3)**  
Cross-listed with ANTH 513. Graduate/Undergraduate version: LING 313. Not offered this academic year. Instructor(s): Tyler.
- LING 515 INTRODUCTION TO SEMANTICS (3)**  
Graduate/Undergraduate version: LING 315. Offered Fall. Instructor(s): Kemmer.
- LING 530 CORPUS LINGUISTICS (3)**  
Graduate/Undergraduate version: LING 330. Not offered this academic year.
- LING 540 THEORY AND METHODS OF TEACHING ESL AND FOREIGN LANGUAGE (3)**  
Graduate/Undergraduate version: LING 340. Not offered this academic year.
- LING 550 DEPARTMENTAL COLLOQUIUM (1)**  
Faculty, graduate students, and invited guests meet weekly to present reports on current research or to discuss current issues in Linguistics. Repeatable for Credit. Offered Fall & Spring.
- LING 551 SEMINAR IN LINGUISTIC THEORY (3)**  
Topics vary from year to year. Repeatable for Credit. Not offered this academic year.
- LING 552 SEMINAR IN SYNTAX AND SEMANTICS (3)**  
Topics vary from year to year. Repeatable for Credit. Not offered this academic year.
- LING 553 SEMINAR IN LINGUISTIC STRUCTURE (3)**  
Topics vary from year to year. Repeatable for Credit. Not offered this academic year. Instructor(s): Bowern.
- LING 554 SEMINAR IN SEMANTIC THEORY (3)**  
Topics vary from year to year. Repeatable for Credit. Not offered this academic year.
- LING 555 SEMINAR IN PHONETICS (3)**  
Topics vary from year to year. Pre-requisite(s): LING 301. Repeatable for Credit. Not offered this academic year. Instructor(s): Niedzielski.
- LING 556 SEMINAR IN LANGUAGE VARIATION (3)**  
Topics vary from year to year. Cross-listed with SWGS 556. Repeatable for Credit. Not offered this academic year.
- LING 557 SEMINAR IN DISCOURSE (3)**  
Topics vary from year to year. Repeatable for Credit. Not offered this academic year.
- LING 558 SEMINAR IN LANGUAGE CHANGE (3)**  
Topics vary from year to year. Pre-requisite(s): LING 505. Repeatable for Credit. Not offered this academic year.
- LING 559 SEMINAR IN PHONOLOGY (3)**  
Topics vary from year to year. Pre-requisite(s): LING 511. Repeatable for Credit. Not offered this academic year. Instructor(s): Crosswhite.
- LING 560 SEMINAR IN LANGUAGE PROCESSING (3)**  
Topics vary from year to year. Pre-requisite(s): LING 311 or LING 511 and LING 504. Repeatable for Credit. Not offered this academic year. Instructor(s): Crosswhite.
- LING 581 GRADUATE RESEARCH (1 TO 12)**  
Repeatable for Credit. Offered Fall & Spring.
- LING 590 TEACHING LINGUISTICS (3 TO 6)**  
Repeatable for Credit. Offered Fall & Spring.

**LING 800 DISSERTATION RESEARCH (1 TO 12)**

Repeatable for Credit. Offered Fall &amp; Spring.

**LPAP (LIFETIME PHYSICAL ACTIVITY PROGRAM)****No College Designated/Lifetime Physical Activity****LPAP 100 INTRODUCTION TO TENNIS (0)**

This class will provide the student with foundational knowledge of tennis skills and rules as well as appropriate sports person-like qualities so that the game can be played with confidence and competence throughout one's lifetime. Course equivalency: LPAP 200. Offered Fall & Spring. Instructor(s): White.

**LPAP 104 INTRODUCTION TO RACQUETBALL AND BADMINTON (0)**

An introduction to basic skills and knowledge necessary to play racquetball and badminton at the beginning level. Course equivalency: LPAP 204. Offered Fall. Instructor(s): Stafford.

**LPAP 105 INTRODUCTION TO BADMINTON (0)**

This course is designed to develop theoretical knowledge and basic badminton strokes and strategies. Course equivalency: LPAP 205. Not offered this academic year.

**LPAP 107 INTERMEDIATE TENNIS (0)**

This class is for the student who already possesses a fundamental knowledge of tennis and is looking to hone and sharpen her/his skills. Course equivalency: LPAP 207. Pre-requisite(s): LPAP 100. Offered Fall & Spring. Instructor(s): White.

**LPAP 108 INTRODUCTION TO RACQUETBALL (0)**

This class offers an introduction to the basic skills and knowledge necessary to play racquetball with confidence and competence. Course equivalency: LPAP 208. Not offered this academic year.

**LPAP 110 INTRODUCTION TO GOLF (0)**

This class will cover the fundamental skills, rules, and etiquette of golf. Course equivalency: LPAP 210. Offered Fall & Spring. Instructor(s): Leber.

**LPAP 111 INTERMEDIATE GOLF (0)**

This class is intended for an intermediate level player. Topics to be covered include: fundamentals, set up, aim & alignment, putting, chipping, irons, and woods. Course equivalency: LPAP 211. Not offered this academic year. Instructor(s): Leber

**LPAP 118 INTRODUCTION TO TEAM SPORTS (0)**

This course is designed to offer an introduction to the skills, basic rules, and strategies of a variety of team sports. Course equivalency: LPAP 218. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 119 INTRODUCTION TO TEAM SPORTS OFFICIATING (0)**

This course is designed to introduce students to the fundamental rules, regulations, mechanics and strategies required to officiate a multitude of team sports. In addition, students will develop strong interpersonal and communication skills necessary for effective game management. Course equivalency: LPAP 219. Offered Fall. Instructor(s): Stafford.

**LPAP 120 INTRODUCTION TO GOLF/ULTIMATE FRISBEE (0)**

This is a course designed to offer an introduction to the fundamental disc golf and ultimate frisbee skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 220. Not offered this academic year.

**LPAP 122 INTRODUCTION TO FLAG FOOTBALL/SOFTBALL (0)**

This is a beginning level course designed to offer an introduction to the fundamental softball and flag-football skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 222. Not offered this academic year.

**LPAP 125 INTRODUCTION TO SOCCER (0)**

This is an entry level course offering fundamental soccer skills, basic rules, and team tactics. These basic principles will be presented through active participation and instruction and evaluated through physical performance, participation and written assessment. Course equivalency: LPAP 225. Offered Fall & Spring. Instructor(s): Henshaw.

**LPAP 126 INTERMEDIATE SOCCER (0)**

This is an intermediate level course offering advanced soccer skills and team tactics. These skills and tactics will be presented through active participation and instruction and evaluated through physical performance, participation and written assignments. Course equivalency: LPAP 226. Not offered this academic year. Instructor(s): Henshaw.

**LPAP 127 INTRODUCTION TO VOLLEYBALL/BASKETBALL (0)**

This is a beginning level course designed to offer an introduction to the fundamentals of basketball and volleyball including skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 227. Not offered this academic year.

**LPAP 129 BASKETBALL (O)**

This is a beginning level course designed to offer an introduction to fundamental basketball skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 229. Not offered this academic year.

**LPAP 131 INTRODUCTION TO MIDDLE EASTERN DANCE (O)**

This is a beginning level course, which will introduce the basic movements of Middle Eastern Dance. Students will also be expected to develop a knowledge and appreciation of Middle Eastern dance as a cultural, communal, and recreational activity. Course equivalency: LPAP 231. Offered Fall. Instructor(s): Koutsoudas.

**LPAP 132 INTERMEDIATE MIDDLE EASTERN DANCE (O)**

This is an intermediate course, which will introduce advanced movements of Middle Eastern Dance. Students will also be expected to develop a knowledge and appreciation of Middle Eastern Dance as a cultural, communal, and recreational activity. Course equivalency: LPAP 232. Pre-requisite(s): LPAP 131. Instructor(s): Koutsoudas.

**LPAP 133 CAPOEIRA (O)**

The student will define Capoeira, understand how it is played and familiarize himself/herself with the rules and traditions of this fascinating aspect of the Brazilian culture. Course equivalency: LPAP 233. Offered Fall & Spring. Instructor(s): Campos.

**LPAP 134 CLASSICAL INDIAN DANCE (O)**

This course focuses on the Bharatanatyam form of dance that is very popular in South India. Bharatanatyam is the oldest of all classical Indian forms and its narrative style is known for its grace, purity, tenderness and its statuesque poses. Course equivalency: LPAP 234. Offered Fall. Instructor(s): Kumar.

**LPAP 140 INTRODUCTION TO BALLROOM DANCE (O)**

Students will learn the basic movements of American Ballroom Dance including the foxtrot, waltz, swing, and tango. Students will obtain a knowledge and appreciation of ballroom dance as a historical and recreational activity. Course equivalency: LPAP 240. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 or 3 and women should register for Section 4 or 5. Failure to register in the correct section will result in a drop from the course. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 141 INTERMEDIATE BALLROOM DANCE (O)**

Students will learn the advanced movements of American Ballroom Dance. Students will obtain a knowledge and appreciation of ballroom dance as a historical and recreational activity. Course equivalency: LPAP 241. Not offered this academic year. Instructor(s): Perry.

**LPAP 142 INTRODUCTION TO LATIN DANCE (O)**

Course content includes demonstration of and brief lectures on the Merengue, Salsa, Mambo, Rumba, Cha Cha, and Tango. Students will participate in drills created to improve footwork, arm positioning, and leading and following skills. Course equivalency: LPAP 242. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 3. Failure to register in the correct section will result in a drop from the course. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 143 INTERMEDIATE LATIN DANCE (O)**

Course content includes demonstration of and brief lectures on the intermediate level of Merengue, Salsa, and Cha Cha. Topics include history of Latin Dance, social dance terminology, proper body alignment, leading and following, and social dance etiquette. Course equivalency: LPAP 243. Not offered this academic year. Instructor(s): Perry.

**LPAP 144 INTRODUCTION TO COUNTRY WESTERN (O)**

Course content includes demonstration of and brief lectures on the Two Step and Polka. Drills are created to improve footwork, arm positioning, and leading and following skills. Other topics: history of C&W Dance, terminology, proper body alignment, leading and following, and social dance etiquette. Course equivalency: LPAP 244. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall. Instructor(s): Perry.

**LPAP 145 INTERMEDIATE COUNTRY WESTERN (O)**

Course content includes demonstration of and brief lectures on the intermediate level Two Step, Polka, and an introduction to Western Cha Cha. Course equivalency: LPAP 245. Not offered this academic year. Instructor(s): Perry.

**LPAP 146 INTRODUCTION TO SWING DANCE (O)**

Course content includes demonstration of and brief lectures on the East Coast Swing, including swing and triple step versions. Students will participate in drills created to improve footwork, arm positioning, and leading and following skills. Course equivalency: LPAP 246. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 147 INTERMEDIATE SWING DANCE (O)**

Course content includes demonstration of and brief lectures on the intermediate level of East Coast Swing, including single step and triple step versions. Course equivalency: LPAP 247. Not offered this academic year. Instructor(s): Perry.

**LPAP 148 DANCE CHOREOGRAPHY (0)**

This course is designed to teach the craft of choreography (dance-making) which includes movement exploration, choreographic devices, compositional structures, partnering, and the selection of themes and music. Course equivalency: LPAP 248. Instructor(s): Valls.

**LPAP 149 ADVANCED DANCE TECHNIQUE AND THEORY (0)**

To develop an advanced level of dance technique through the study of different dance styles (modern dance, ballet, and jazz dance) with emphasis on understanding the anatomical body, training methods (body therapies), and performance skills. Course taught by dance staff and guest teachers. Course equivalency: LPAP 249. Offered Fall. Instructor(s): Valls; Lidvall.

**LPAP 150 IMPROVISATION AND COMPOSITION DANCE (0)**

The class will focus on expanding students' creative movement through improvisational dance, which will allow for self-discovery, self-experience, and will build composition/choreography skills. The unique input of each student is valued. Each class will give students a physical experience on which to build their intuitive and kinesthetic knowledge. This knowledge, coupled with intellectual understanding is needed to understand the craft of choreography. Course equivalency: LPAP 250. Offered Fall. Instructor(s): Valls.

**LPAP 151 ALEXANDER TECHNIQUE (0)**

We all have habits of tension that interfere with our natural ease in movement. The Alexander Technique helps us to first recognize our habits and then interrupt them so we can experience greater freedom, strength, and coordination in our movement. Course equivalency: LPAP 251. Offered Fall & Spring. Instructor(s): Lidvall.

**LPAP 152 INTRODUCTION TO MODERN DANCE (0)**

This is a beginning dance class that introduces students to modern dance technique and the performing of dance combinations to music. The class has a progression: core work on the floor; exercises at center; moving across the floor; and jumps. The majority of the classes are spent learning dance technique, however, some time will also be spent on the history of modern dance and choreographing a short dance performance. Course equivalency: LPAP 252. Offered Fall & Spring. Instructor(s): Valls.

**LPAP 153 INTERMEDIATE MODERN DANCE (0)**

An intermediate level modern dance class that incorporates a variety of modern dance techniques including: Graham, Holm, Hawkins, Limon, and Evans. The class places emphasis on correct anatomical alignment, breathe and release, rhythmic and spatial accuracy, and performance commitment. Students will be expected to master complex movement phrases and become familiar with stylistic and historic components of modern dance from the 1960's to the present. Course equivalency: LPAP 253. Offered Fall. Instructor(s): Valls.

**LPAP 154 ADVANCED MODERN DANCE (0)**

To develop an advanced level of modern dance technique to include: basic body alignment; neuromuscular coordination; rhythmic accuracy; movement memory; spatial skills; use of energy; and performing skills. Students are expected to master complex movement phrases and become familiar with stylistic, and historical components of modern dance. Course equivalency: LPAP 254. Pre-requisite(s): LPAP 153. Not offered this academic year. Instructor(s): Valls.

**LPAP 155 INTRODUCTION TO BALLET (0)**

This course will introduce students to the basic principles and steps of ballet technique. It is designed to increase the students' knowledge and understanding of the structure of the human body and how the structure functions to greatest benefit in ballet technique. Course equivalency: LPAP 255. Offered Fall. Instructor(s): Lidvall.

**LPAP 156 INTERMEDIATE BALLET (0)**

This class will introduce students to advanced principles and steps of ballet technique. Course equivalency: LPAP 256. Offered Spring. Instructor(s): Lidvall.

**LPAP 157 JAZZ DANCE/HIP HOP (0)**

A beginning level dance class that teaches basic technique, performance, dance fitness, alignment, and introduces the stylistic and historical components of jazz dance and hip/hop. Course equivalency: LPAP 257. Offered Fall & Spring. Instructor(s): Nalett.

**LPAP 160 AQUATIC EXERCISE (0)**

This course is designed to increase fitness through the use of a variety of water exercise activities. The course will contain a cognitive component, which includes information concerning fitness, health, and wellness. The course will contain a written exam, fitness testing, lab activities, and shallow and deep water work-outs. Course requires a one piece bathing suit. Course equivalency: LPAP 260. Recommended: Course requires a one piece bathing suit. Offered Fall. Instructor(s): Harwood.

**LPAP 161 INTRODUCTION TO AQUATIC ACTIVITIES (0)**

This course is designed to increase knowledge of aquatic activities while increasing fitness through the use of a variety of water exercise activities. The course will contain a cognitive component that includes information concerning fitness, health, and wellness. The course will contain a written exam, fitness testing, lab activities, and shallow and deep-water workouts. Course equivalency: LPAP 261. Course requires a one piece bathing suit. Instructor(s): Harwood.

**LPAP 162 WATER SAFETY INSTRUCTOR (0)**

Students will work toward the American Red Cross Water Safety Instructor Certification. \$57.00 additional course fee. Course equivalency: LPAP 262. Recommended: Students must be competent swimmers; course requires one piece bathing suit. Not offered this academic year. Instructor(s): Pecsénye.

**LPAP 163 LIFEGUARD INSTRUCTOR (0)**

This course offers training and possible certification in the American Red Cross Lifeguard Training, Community First Aid and Safety, and CPR for the Professional Rescuer. \$30 fee. Course equivalency: LPAP 263. Course requires a one piece bathing suit, and the swimmer must be able to swim at least 300 yards. Not offered this academic year. Instructor(s): Harwood.

**LPAP 164 FITNESS SWIMMING (0)**

This course is designed to increase fitness through the use of swimming. There will also be a knowledge component to the course that includes information concerning fitness, health, stroke mechanics and wellness. The objective of the course is for students to design their own swimming workouts to meet their fitness goals. Course equivalency: LPAP 264. Course requires a one piece bathing suit, and the swimmer must be able to swim at least 300 yards. Offered Fall & Spring. Instructor(s): Harwood.

**LPAP 165 INTERMEDIATE FITNESS SWIMMING (0)**

This intermediate course is designed to increase fitness through the use of swimming. There will also be a knowledge component to the course, which includes information concerning fitness, health, stroke mechanics and wellness. Students will design their own swimming program based on self selected goals for the semester. Course equivalency: LPAP 265. Recommended: Students must be competent swimmers; course requires one piece bathing suit. Not offered this academic year. Instructor(s): Harwood.

**LPAP 166 BEGINNING SWIMMING (0)**

This course is designed to offer basic knowledge and skill for the beginning swimmer. The following strokes and skills will be taught during the class: water entries, floating, rhythmic breathing patterns, front crawl, elementary back stroke, back crawl, deep water exploration, and treading water. Course equivalency: LPAP 266. Recommended: Course requires a one piece bathing suit. Offered Spring. Instructor(s): Harwood.

**LPAP 167 SPECIALIZED AQUATICS (0)**

This course is designed to offer more advanced knowledge and skill development in a variety of aquatic activities. Focus will be given to areas based on student selection. Course equivalency: LPAP 267. Not offered this academic year. Instructor(s): Harwood.

**LPAP 170 YOGA (0)**

This course provides a solid foundation in the principals of yoga theory and practice. By incorporating traditional philosophy, physical poses (asana) and breath control (pranayama), this class helps you to discover vitality, flexibility and strength within yourself. Through committed involvement and an open mind, you will experience first hand the profound aspects of yoga. Course equivalency: LPAP 270. Offered Fall & Spring. Instructor(s): Perkins.

**LPAP 171 TAI CHI (0)**

This is a beginning course, which is designed to introduce the historical, philosophical, and physical foundations of Tai Chi. Course equivalency: LPAP 271. Offered Spring. Instructor(s): Lu.

**LPAP 172 INTRODUCTION TO FENCING (0)**

This is a beginning course, which is designed to introduce the student to the skills and strategy necessary to enjoy fencing. Course equivalency: LPAP 272. Not offered this academic year. Instructor(s): Hamza.

**LPAP 173 INTERMEDIATE FENCING (0)**

This course is designed to introduce the student to the skills and strategy necessary to participate in fencing at the intermediate level. Course equivalency: LPAP 273. Not offered this academic year. Instructor(s): Hamza.

**LPAP 175 MARTIAL ARTS (0)**

This course is designed to introduce the students to the skills and strategy necessary to participate in Martial Arts. Course equivalency: LPAP 275. Offered Fall. Instructor(s): Kim.

**LPAP 176 SELF DEFENSE FOR WOMEN (0)**

This course exposes students to a program of realistic self-defense tactics and techniques. It is a comprehensive course for women that begins with awareness, prevention, risk reduction and avoidance, while progressing through the basics of hands-on defense training. Course equivalency: LPAP 276. Offered Fall & Spring. Instructor(s): Marshall.

**LPAP 177 INTERMEDIATE YOGA TECHNIQUES (0)**

This course builds on the primary principles of yoga theory and practice that are learned in LPAP 170. This class will introduce more advanced physical poses, breath control and meditation techniques. Course equivalency: LPAP 277. Pre-requisite(s): LPAP 170. Instructor permission required. Offered Spring. Instructor(s): Perkins.

**LPAP 178 THE ART AND SCIENCE OF RELAXATION (0)**

This course is designed to provide students with an overview of the evolution of relaxation techniques and the various forms they have taken in different cultures across time. Each class will focus on the stress-relieving benefits of and different modalities for relaxation practice. Course equivalency: LPAP 278. Instructor(s): Fraser.

**LPAP 180 WALK, JOG, RUN (O)**

The purpose of this class is to teach students how to improve cardiovascular and muscular strength, endurance, stress management and weight control. Course equivalency: LPAP 280. Offered Fall & Spring. Instructor(s): Thompson.

**LPAP 181 PERSONAL FITNESS (O)**

Class will consist of brief lectures on health and fitness topics. Students will be exposed to activities that may be incorporated into an individualized personal fitness program. The goal of this course is to motivate the students to include physical activity as an integral part of his/her lifestyle. Course equivalency: LPAP 281. Not offered this academic year.

**LPAP 182 WEIGHT TRAINING (O)**

The class will consist of brief lectures and discussions on the topics listed in the course outline. Students will be exposed to several different types of weight training techniques throughout the semester that may be incorporated into an individual's personal fitness program. Course equivalency: LPAP 282. Offered Fall & Spring. Instructor(s): Slator; Moore.

**LPAP 183 WEIGHT TRAINING AND CONDITIONING (O)**

Students will be exposed to several different types of weight training and cardiovascular conditioning techniques throughout the semester that may be incorporated into an individual's personal fitness program. Course equivalency: LPAP 283. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 184 FIT TO BE WELL (O)**

This course is designed to offer a comprehensive look at wellness and physical fitness and provide workable approaches to a healthy lifestyle. Course equivalency: LPAP 284. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 185 CARDIO KICKBOXING (O)**

Kickboxing combines the best of boxing and other martial arts techniques and brings it to you in an exciting and easy to learn format. As the name implies, cardio kickboxing involves kickboxing movements, but with cardiovascular training principles. Course equivalency: LPAP 285. Offered Spring. Instructor(s): Thompson.

**LPAP 186 PILATES (O)**

This is a beginning level course designed to offer an introduction to the fundamentals and beginner/intermediate classic Pilates mat work exercises. The acquisition and understanding of these exercises, their goal, and intent will be presented through activity and lecture sessions and will be evaluated through physical performance, participation, and written assessment. Course equivalency: LPAP 286. Offered Fall & Spring. Instructor(s): Niewola.

**LPAP 187 GROUP FITNESS (O)**

The purpose of this class will be to provide students a learning opportunity in the broad area of group exercise. Course equivalency: LPAP 287. Offered Fall. Instructor(s): Thompson.

**LPAP 188 TRACK AND FIELD (O)**

The main objective of this class is to introduce students to track and field concepts, running events, and field events through various teaching methods. Students will have an opportunity to identify what track event and field event skills they possess through skill trials. Course equivalency: LPAP 288. Not offered this academic year.

**LPAP 189 BOOT CAMP (O)**

Boot camp is a fitness training course, which includes intense cardiovascular and muscular strength exercises. Activities may include but are not limited to jumping rope, running, agility plus speed drills, plyometrics, stair drills, ab workouts, and stretching. Course equivalency: LPAP 289. Not offered this academic year.

**LPAP 190 INTRODUCTION TO OUTDOOR ACTIVITIES (O)**

This course will offer students the opportunity to explore a variety of outdoor activities. Possible activities will include; orienteering, group leadership activities, boating, camping, snorkeling, biking and hiking. The class will be a combination of knowledge and hands on practical application. Course equivalency: LPAP 290. Course requires one piece bathing suit. Offered Spring. Instructor(s): Harwood

**LPAP 191 GROUP FITNESS INSTRUCTOR TRAINING (O)**

This course is designed to provide the theoretical and practical skills necessary to achieve a national certification in group fitness instruction. The student will develop and lead group fitness routines as well as learn the general principles of anatomy, exercise science, and biomechanics. \$30.00 additional course fee. Course equivalency: LPAP 291. Not offered this academic year. Instructor(s): Thompson.

**LPAP 192 EXERCISE AND WEIGHT MANAGEMENT (O)**

This course is intended to help students gain a comprehensive understanding of the various dimensions of weight and exercise management. Topics covered in the course include nutrition and portion control, emotional eating, Health/Medical perspectives, support-building, and creating sustainable exercise programs. Course equivalency: LPAP 292. Instructor(s): Slator.

**LPAP 193 WEIGHT TRAINING FOR WOMEN (O)**

This course is designed to provide female students with a non-intimidating environment in which they can learn the fundamental principles of resistance training, the focus of the course will be on safe lifting practices, exercise variegation/manipulation, and program design. Course equivalency: LPAP 293. Instructor(s): Slator.

**LPAP 198 NUTRITION AND FITNESS CONCEPTS (0)**

The class will consist of lectures and discussions on topics such as nutrition and wellness. Students will also be exposed to information and activities throughout the semester that may be incorporated into an individual's personal wellness program. Course equivalency: LPAP 298. Offered Fall & Spring. Instructor(s): Symeonidis.

**LPAP 199 INDEPENDENT STUDY (0)**

Counts toward graduation requirement. Course equivalency: LPAP 299. Department permission required. Instructor(s): Slator.

**LPAP 200 INTRODUCTION TO TENNIS (1)**

This class will provide the student with a foundational knowledge of tennis skills and rules as well as appropriate sports person-like qualities so that the game can be played with confidence and competence throughout one's lifetime. Course equivalency: LPAP 100. Department permission required. Offered Fall & Spring. Instructor(s): White.

**LPAP 204 INTRODUCTION TO RACQUETBALL AND BADMINTON (1)**

An introduction to basic skills and knowledge necessary to play racquetball and badminton at the beginning level. For credit, does not count towards graduation requirement. Course equivalency: LPAP 104. Department permission required. Offered Fall. Instructor(s): Stafford.

**LPAP 205 INTRODUCTION TO BADMINTON (1)**

This course is designed to develop theoretical knowledge and basic badminton strokes and strategies. Course equivalency: LPAP 105. Department permission required. Not offered this academic year.

**LPAP 207 INTERMEDIATE TENNIS (1)**

This class is for the students who already possesses a fundamental knowledge of tennis and is looking to hone and sharpen her/his skills. Course equivalency: LPAP 107. Pre-requisite(s): (LPAP 100). Department permission required. Offered Fall & Spring. Instructor(s): White.

**LPAP 208 INTRODUCTION TO RACQUETBALL (1)**

This class offers an introduction to the basic skills and knowledge necessary to play racquetball with confidence and competence. Course equivalency: LPAP 108. Department permission required. Not offered this academic year.

**LPAP 210 INTRODUCTION TO GOLF (1)**

This class will cover the fundamental skills, rules, and etiquette of golf. Course equivalency: LPAP 110. Department permission required. Offered Fall & Spring. Instructor(s): Leber.

**LPAP 211 INTERMEDIATE GOLF (1)**

This class is intended for an intermediate level player. Topics to be covered include: fundamentals, set up, aim & alignment, putting, chipping, irons, and woods. Course equivalency: LPAP 111. Department permission required. Not offered this academic year. Instructor(s): Leber

**LPAP 218 INTRODUCTION TO TEAM SPORTS (1)**

This course is designed to offer an introduction to the skills, basic rules, and strategies of a variety of team sports. Course equivalency: LPAP 118. Department permission required. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 219 INTRODUCTION TO TEAM SPORTS OFFICIATING (1)**

This course is designed to introduce students to the fundamental rules, regulations, mechanics and strategies required to officiate a multitude of team sports. In addition, students will develop strong interpersonal and communication skills necessary for effective game management. Course equivalency: LPAP 119. Department permission required. Offered Fall. Instructor(s): Stafford.

**LPAP 220 INTRODUCTION TO GOLF/ULTIMATE FRISBEE (1)**

This is a course designed to offer an introduction to the fundamental disc golf and ultimate frisbee skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 120. Department permission required. Not offered this academic year.

**LPAP 222 INTRODUCTION TO FLAG FOOTBALL/SOFTBALL (1)**

This is a beginning level course designed to offer an introduction to the fundamental softball and flag-football skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 122. Department permission required. Not offered this academic year.

**LPAP 225 INTRODUCTION TO SOCCER (1)**

This is an entry level course offering fundamental soccer skills, basic rules, and team tactics. These basic principles will be presented through active participation and instruction and evaluated through physical performance, participation and written assessment. Course equivalency: LPAP 125. Department permission required. Offered Fall & Spring. Instructor(s): Henshaw.

**LPAP 226 INTERMEDIATE SOCCER (1)**

This is an intermediate level course offering advanced soccer skills and team tactics. These skills and tactics will be presented through active participation and instruction and evaluated through physical performance, participation and written assignment. Course equivalency: LPAP 126. Department permission required. Not offered this academic year. Instructor(s): Henshaw.

**LPAP 227 INTRODUCTION TO VOLLEYBALL/BASKETBALL (1)**

This is a beginning level course designed to offer an introduction to the fundamentals of basketball and volleyball including skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 127. Department permission required. Not offered this academic year.

**LPAP 229 BASKETBALL (1)**

This is a beginning level course designed to offer an introduction to fundamental basketball skills, basic rules, and team play strategies. The acquisition and understanding of these skills and strategies will be presented through activity and lecture sessions. Course equivalency: LPAP 129. Department permission required. Not offered this academic year.

**LPAP 231 INTRODUCTION TO MIDDLE EASTERN DANCE (1)**

This is a beginning level course, which will introduce the basic movements of Middle Eastern Dance. Students will also be expected to develop a knowledge and appreciation of Middle Eastern dance as a cultural, communal, and recreational activity. Course equivalency: LPAP 131. Department permission required. Offered Fall. Instructor(s): Koutsoudas.

**LPAP 232 INTERMEDIATE MIDDLE EASTERN DANCE (1)**

This is an intermediate course, which will introduce advanced movements of Middle Eastern Dance. Students will also be expected to develop a knowledge and appreciation of Middle Eastern Dance as a cultural, communal, and recreational activity. Course equivalency: LPAP 132. Department permission required. Instructor(s): Koutsoudas.

**LPAP 233 CAPOEIRA (1)**

The student will define Capoeira, understand how it is played and familiarize himself/herself with the rules and traditions of this fascinating aspect of the Brazilian culture. Course equivalency: LPAP 133. Department permission required. Offered Fall & Spring. Instructor(s): Campos.

**LPAP 234 CLASSICAL INDIAN DANCE (1)**

This course focuses on the Bharatanatyam form of this dance that is very popular in South India. Bharatanatyam is the oldest of all classical Indian forms and its narrative style is known for its grace, purity, tenderness and its statuesque poses. Course equivalency: LPAP 134. Department permission required. Offered Fall. Instructor(s): Kumar.

**LPAP 240 INTRODUCTION TO BALLROOM DANCE (1)**

Students will learn the basic movements of American Ballroom Dance including the foxtrot, waltz, swing, and tango. Students will obtain a knowledge and appreciation of ballroom dance as a historical and recreational activity. Course equivalency: LPAP 140. Department permission required. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 241 INTERMEDIATE BALLROOM DANCE (1)**

Students will learn the advanced movements of American Ballroom Dance. Students will obtain a knowledge and appreciation of ballroom dance as a historical and recreational activity. Course equivalency: LPAP 141. Department permission required. Not offered this academic year. Instructor(s): Perry.

**LPAP 242 INTRODUCTION TO LATIN DANCE (1)**

Course content includes demonstration of and brief lectures on the Merengue, Salsa, Mambo, Rumba, Cha Cha, and Tango. Students will participate in drills created to improve footwork, arm positioning, and leading and following skills. Course equivalency: LPAP 142. Department permission required. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 243 INTERMEDIATE LATIN DANCE (1)**

Course content includes demonstration of and brief lectures on the intermediate level of Merengue, Salsa, and Cha Cha. Topics include history of Latin Dance, social dance terminology, proper body alignment, leading and following, and social dance etiquette. Course equivalency: LPAP 143. Department permission required. Not offered this academic year. Instructor(s): Perry.

**LPAP 244 INTRODUCTION TO COUNTRY WESTERN (1)**

Course content includes demonstration of and brief lectures on the Two Step and Polka. Drills are created to improve footwork, arm positioning, and leading and following skills. Other topics: history of C&W Dance, terminology, proper body alignment, leading and following, and social dance etiquette. Course equivalency: LPAP 144. Department permission required. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall. Instructor(s): Perry.

**LPAP 245 INTERMEDIATE COUNTRY WESTERN (1)**

Course content includes demonstration of and brief lectures on the intermediate level Two Step, Polka, and an introduction to Western Cha Cha. Course equivalency: LPAP 145. Department permission required. Not offered this academic year. Instructor(s): Perry.



**LPAP 246 INTRODUCTION TO SWING DANCE (1)**

Course content includes demonstration of and brief lectures on the East Coast Swing, including swing and triple step versions. Students will participate in drills created to improve footwork, arm positioning, and leading and following skills. Course equivalency: LPAP 146. Department permission required. This social dance class is performed in couples requiring an equal number of men and women. Men should register for Section 1 and women should register for Section 2. Failure to register in the correct section will result in the loss of placement in the class. Offered Fall & Spring. Instructor(s): Perry; Banta.

**LPAP 247 INTERMEDIATE SWING DANCE (1)**

Course content includes demonstration of and brief lectures on the intermediate level of East Coast Swing, including single step and triple step versions. Course equivalency: LPAP 147. Department permission required. Not offered this academic year. Instructor(s): Perry.

**LPAP 248 DANCE CHOREOGRAPHY (1)**

This course is designed to teach the craft of choreography (dance-making) which includes movement exploration, choreographic devices, compositional structures, partnering, and the selection of themes and music. Course equivalency: LPAP 148. Department permission required.

**LPAP 249 ADVANCED DANCE TECHNIQUE AND THEORY (1)**

To develop an advanced level of dance technique through the study of different styles (modern dance, ballet, and jazz dance) with emphasis on understanding the anatomical body, training methods (body therapies), and performance skills. Course taught by dance staff and guest teachers. Course equivalency: LPAP 149. Department permission required. Limited enrollment. Offered Fall. Instructor(s): Valls, Lidvall.

**LPAP 250 IMPROVISATION AND COMPOSITION DANCE (1)**

The class will focus on expanding students' creative movement through improvisational dance which will allow for self-discovery, self-expression, and will build composition/choreography skills. The unique input of each student is valued. Each class will give students a physical experience on which to build their intuitive and kinesthetic knowledge. This knowledge, coupled with intellectual understanding is needed to understand the craft of choreography. Course equivalency: LPAP 150. Department permission required. Offered Fall. Instructor(s): Valls.

**LPAP 251 ALEXANDER TECHNIQUE (1)**

We all have habits of tension that interfere with our natural ease in movement. The Alexander Technique helps us to first recognize our habits and then interrupt them so we can experience greater freedom, strength, and coordination in our movement. Course equivalency: LPAP 151. Department permission required. Offered Fall & Spring. Instructor(s): Lidvall.

**LPAP 252 INTRODUCTION TO MODERN DANCE (1)**

This is a beginning dance class that introduces students to modern dance technique and the performing of dance combination to music. The class has a progression; core work on the floor; exercises at center; moving across the floor; and jumps. The majority of the classes are spent learning dance technique, however, some time will also be spent on the history of modern dance and choreography short dance performance. Course equivalency: LPAP 152. Department permission required. Offered Fall & Spring. Instructor(s): Valls.

**LPAP 253 INTERMEDIATE MODERN DANCE (1)**

An intermediate level modern dance class that incorporates a variety of modern dance techniques including: Graham, Holm, Hawkins, Limon, and Evans. The class places emphasis on correct anatomical alignment, breathe and release, rhythmic and spatial accuracy, and performance commitment. Students will be expected to master complex movement phrases and become familiar with stylistic and historic components of modern dance from the 1960's to the present. Course equivalency: LPAP 153. Department permission required. Offered Fall. Instructor(s): Valls.

**LPAP 254 ADVANCED MODERN DANCE (1)**

To develop an advanced level of modern dance technique to include: basic body alignment; neuromuscular coordination; rhythmic accuracy; movement memory; spatial skills; use of energy; and performing skills. Students are expected to master complex movement phrases and become familiar with stylistic, and historical components of modern dance. Course equivalency: LPAP 154. Pre-requisite(s): LPAP 153. Department permission required. Not offered this academic year. Instructor(s): Valls.

**LPAP 255 INTRODUCTION TO BALLET (1)**

This class will introduce students to the basic principles and steps of ballet technique. It is designed to increase the students' knowledge and understanding of the structure of the human body and how the structure functions to greatest benefit in ballet technique. Course equivalency: LPAP 155. Department permission required. Offered Fall. Instructor(s): Lidvall.

**LPAP 256 INTERMEDIATE BALLET (1)**

This class will introduce students to advanced principles and steps of ballet technique. Course equivalency: LPAP 156. Department permission required. Offered Spring. Instructor(s): Lidvall.

**LPAP 257 JAZZ DANCE/HIP HOP (1)**

A beginning level dance class that teaches basic technique, performance, dance fitness, alignment, and introduces the stylistic and historical components of jazz dance. Course equivalency: LPAP 157. Department permission required. Offered Fall & Spring. Instructor(s): Nalett.

**LPAP 260 AQUATIC EXERCISE (1)**

This course is designed to increase fitness through the use of a variety of water exercise activities. The course will contain a cognitive component, which includes information concerning fitness, health, and wellness. The course will contain a written exam, fitness testing, lab activities, and shallow and deep water work-outs. Course equivalency: LPAP 160. Department permission required. Recommended: Course requires a one piece bathing suit. Offered Fall. Instructor(s): Harwood.

**LPAP 261 INTRODUCTION TO AQUATIC ACTIVITIES (1)**

This course is designed to offer basic knowledge and skill development in a variety of aquatic activities. Focus will be given to basic swimming and diving techniques as well as comparative, recreational, and fitness activities. Course equivalency: LPAP 161. Department permission required. Recommended: Course requires a one piece bathing suit. Instructor(s): Harwood.

**LPAP 262 WATER SAFETY INSTRUCTOR (1)**

This course is designed to increase knowledge of aquatic activities while increasing fitness through the use of a variety of water exercise activities. The course will contain a cognitive component that includes information concerning fitness, health, and wellness. The course will contain a written exam, fitness testing, lab activities, and shallow and deep-water workouts. \$57.00 additional course fee. Course equivalency: LPAP 162. Department permission required. Course requires a one piece bathing suit. Students must be competent swimmers. Not offered this academic year. Instructor(s): Pecsénye.

**LPAP 263 LIFEGUARD INSTRUCTOR (1)**

This course offers training and possible certification in the American Red Cross Lifeguard Training, Community First Aid and Safety, and CPR for the Professional Rescuer. \$30 fee. Course equivalency: LPAP 163. Department permission required. The course requires a one piece bathing suit and the swimmer must be able to swim at least 300 yards. Not offered this academic year. Instructor(s): Harwood.

**LPAP 264 FITNESS SWIMMING (1)**

This course is designed to increase fitness through the use of swimming. There will also be a knowledge component to the course that includes information concerning fitness, health, stroke mechanics and wellness. The objective of the course is for students to design their own swimming workouts to meet their fitness goals. Course equivalency: LPAP 164. Department permission required. Course requires a one piece bathing suit and the swimmer must be able to swim at least 300 yards. Offered Fall & Spring. Instructor(s): Harwood.

**LPAP 265 INTERMEDIATE FITNESS SWIMMING (1)**

This intermediate course is designed to increase fitness through the use of swimming. There will also be a knowledge component to the course, which includes information concerning fitness, health, stroke mechanics and wellness. Students will design their own swimming program based on self selected goals for the semester. Course equivalency: LPAP 165. Department permission required. Recommended: Students must be competent swimmers; course requires a one piece bathing suit. Not offered this academic year. Instructor(s): Harwood.

**LPAP 266 BEGINNING SWIMMING (1)**

This course is designed to offer basic knowledge and skill for the beginning swimmer. The following strokes and skills will be taught during the class: water entries, floating, rhythmic breathing patterns, front crawl, elementary back stroke, back crawl, deep water exploration, and treading water. Course equivalency: LPAP 166. Department permission required. Recommended: Course requires a one piece bathing suit. Offered Spring. Instructor(s): Harwood.

**LPAP 267 SPECIALIZED AQUATICS (1)**

This course is designed to offer more advanced knowledge and skill development in a variety of aquatic activities. Focus will be given to areas based on student selection. Course equivalency: LPAP 167. Department permission required. Course requires a one piece bathing suit. Not offered this academic year. Instructor(s): Harwood.

**LPAP 270 YOGA (1)**

This course provides a solid foundation in the principals of yoga theory and practice. By incorporating traditional philosophy, physical poses (asana) and breath control (pranayama), this class helps you to discover vitality, flexibility and strength within yourself. Through committed involvement and an open mind, you will experience first hand the profound aspects of yoga. Course equivalency: LPAP 170. Department permission required. Offered Fall & Spring. Instructor(s): Perkins

**LPAP 271 TAI CHI (1)**

This is a beginning course, which is designed to introduce the historical, philosophical, and physical foundations of Tai Chi. Course equivalency: LPAP 171. Department permission required. Offered Spring. Instructor(s): Lu.

**LPAP 272 INTRODUCTION TO FENCING (1)**

This is a beginning course, which is designed to introduce the student to the skills and strategy necessary to enjoy fencing. Course equivalency: LPAP 172. Department permission required. Not offered this academic year. Instructor(s): Hamza.

**LPAP 273 INTERMEDIATE FENCING (1)**

This course is designed to introduce the student to the skills and strategy necessary to participate in fencing at the intermediate level. Course equivalency: LPAP 173. Department permission required. Not offered this academic year. Instructor(s): Hamza.

**LPAP 275 MARTIAL ARTS (1)**

This course is designed to introduce the students to the skills and strategy necessary to participate in Martial Arts. Course equivalency: LPAP 175. Department permission required. Offered Fall. Instructor(s): Kim.

**LPAP 276 SELF DEFENSE FOR WOMEN (1)**

This course exposes students to a program of realistic, self-defense tactics and techniques. It is a comprehensive course for women that begins with awareness, prevention, risk reduction and avoidance, while progressing through the basics of hands-on defense training. Course equivalency: LPAP 176. Department permission required. Offered Fall & Spring. Instructor(s): Marshall.

**LPAP 277 INTERMEDIATE YOGA TECHNIQUES (1)**

This course builds on the primary principles of yoga theory and practice that are learned in LPAP 170. This class will introduce more advanced physical poses, breath control and meditation techniques. Course equivalency: LPAP 177. Department permission required. Offered Spring. Instructor(s): Perkins.

**LPAP 278 THE ART AND SCIENCE OF RELAXATION (1)**

This course is designed to provide students with an overview of the evolution of relaxation techniques and the various forms they have taken in different cultures across time. Each class will focus on the stress-relieving benefits of and different modalities for relaxation practices. Course equivalency: LPAP 178. Instructor(s): Fraser.

**LPAP 280 WALK, JOG, RUN (1)**

The purpose of this class is to teach students how to improve cardiovascular and muscular strength, endurance, stress management and weight control. Course equivalency: LPAP 180. Department permission required. Offered Fall & Spring. Instructor(s): Thompson.

**LPAP 281 PERSONAL FITNESS (1)**

Class will consist of brief lectures on health and fitness topics. Students will be exposed to activities that may be incorporated into an individualized personal fitness program. The goal of this course is to motivate the students to include physical activity as an integral part of his/her lifestyle. Course equivalency: LPAP 181. Department permission required. Not offered this academic year.

**LPAP 282 WEIGHT TRAINING (1)**

The class will consist of brief lectures and discussions on the topics listed in the course outline. Students will be exposed to several different types of weight training techniques throughout the semester that may be incorporated into an individual's personal fitness program. Course equivalency: LPAP 182. Department permission required. Instructor(s): Slator; Moore.

**LPAP 283 WEIGHT TRAINING AND CONDITIONING (1)**

Students will be exposed to several different types of weight training and cardiovascular conditioning techniques throughout the semester that may be incorporated into an individual's personal fitness program. Course equivalency: LPAP 183. Department permission required. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 284 FIT TO BE WELL (1)**

This course is designed to offer a comprehensive look at wellness and physical fitness and provide workable approaches to a healthy lifestyle. Course equivalency: LPAP 184. Department permission required. Offered Fall & Spring. Instructor(s): Slator.

**LPAP 285 CARDIO KICKBOXING (1)**

Kickboxing combines the best of boxing and other martial arts techniques and brings it to you in an exciting and easy to learn format. As the name implies, cardio kickboxing involves kickboxing movements, but with cardiovascular training principles. Course equivalency: LPAP 185. Department permission required. Offered Spring. Instructor(s): Thompson.

**LPAP 286 PILATES (1)**

This is a beginning level course designed to offer an introduction to the fundamentals and beginner/intermediate classic Pilates mat work exercises. The acquisition and understanding of these exercises, their goal, and intent will be presented through activity and lecture sessions and will be evaluated through physical performance, participation, and written assessment. Course equivalency: LPAP 186. Department permission required. Offered Fall & Spring. Instructor(s): Niewola.

**LPAP 287 GROUP FITNESS (1)**

The purpose of this class will be to provide students a learning opportunity in the broad area of group exercise. Course equivalency: LPAP 187. Department permission required. Offered Fall. Instructor(s): Thompson.

**LPAP 288 TRACK AND FIELD (1)**

The main objective of this class is to introduce students to track and field concepts, running events, and field events through various teaching methods. Students will have an opportunity to identify what track event and field event skills they possess through skill trials. Course equivalency: LPAP 188. Department permission required. Not offered this academic year.

**LPAP 289 BOOT CAMP (1)**

Boot camp is a fitness training course, which includes intense cardiovascular and muscular strength exercises. Activities may include but are not limited to jumping rope, running, agility plus speed drills, plyometrics, stair drills, ab workouts, and stretching. Course equivalency: LPAP 189. Department permission required. Not offered this academic year.

**LPAP 290 INTRODUCTION TO OUTDOOR ACTIVITIES (1)**

This course will offer students the opportunity to explore a variety of outdoor activities. Possible activities will include; orienteering, group leadership activities, boating, camping, snorkeling, biking and hiking. The class will be a combination of knowledge and hands on practical application. Course equivalency: LPAP 190. Department permission required. Course requires one piece bathing suit. Offered Spring. Instructor(s): Harwood.

**LPAP 291 GROUP FITNESS INSTRUCTOR TRAINING (1)**

This course is designed to provide the theoretical and practical skills necessary to achieve a national certification in group fitness instruction. The student will develop and lead group fitness routines as well as learn the general principles of anatomy, exercise science, and biomechanics. \$30.00 additional course fee. Course equivalency: LPAP 191. Must be enrolled in one of the following Level(s): Undergraduate. Department permission required. Not offered this academic year. Instructor(s): Thompson.

**LPAP 292 EXERCISE AND WEIGHT MANAGEMENT (1)**

This course is intended to help students gain a comprehensive understanding of the various dimensions of weight and exercise. Topics covered in the course include nutrition and portion control, emotional eating, health/medical perspectives, support-building, and creating sustainable exercise programs. Course equivalency: LPAP 192. Instructor(s): Slator.

**LPAP 293 WEIGHT TRAINING FOR WOMEN (1)**

This course is designed to provide female students with a non-intimidating environment in which they can learn the fundamental principles of resistance training. The focus of the course will be on safe lifting practices, exercise variation/manipulation, and program design. Course equivalency: LPAP 193. Instructor(s): Slator.

**LPAP 298 NUTRITION AND FITNESS CONCEPTS (1)**

The class will consist of lectures and discussions on topics such as nutrition and wellness. Students will also be exposed to information and activities throughout the semester that may be incorporated into an individual's personal wellness program. Course equivalency: LPAP 198. Department permission required. Offered Fall & Spring. Instructor(s): Symeonidis.

**LPAP 299 INDEPENDENT STUDY (1)**

Course equivalency: LPAP 199. Department permission required. Instructor(s): Slator.

**MANA (MANAGERIAL STUDIES)****School of Social Sciences/Managerial Studies****MANA 404 MANAGEMENT COMMUNICATIONS IN A CONSULTING SIMULATION (3)**

The capstone course for the MANA major. Students must have completed 8 of the required courses for the major. Section 001-Teaches managerial communications with a focus on business strategy and communication problems. Section 002 (offered spring semester only)- Teaches managerial communications with a focus on entrepreneurship as well as management. Must be enrolled in one of the following Major(s): Managerial Studies. Must have completed eight managerial studies required courses. Limited enrollment. Offered Fall & Spring. URL: [www.ruf.rice.edu/~junef/mana404/](http://www.ruf.rice.edu/~junef/mana404/). Instructor(s): Ferrill.

**MANA 497 INDEPENDENT STUDY (3)**

Independent research project with a Faculty member in the Jones Graduate School of Management. Only for students in the Honors Program of Managerial Studies. Must have the approval of the Director of Managerial Studies and the participating Jones School Faculty Member. Must be enrolled in one of the following Major(s): Managerial Studies. Instructor permission required.

**MANA 498 INDEPENDENT STUDY (3)**

See MANA 497. Must be enrolled in one of the following Major(s): Managerial Studies. Instructor permission required.

**MANA 499 LEGAL THEMES ENG. & MANAGING (3)**

Introduction to fundamental legal concepts of the American legal system for upper level undergraduate students, primarily aimed at what engineers, scientists, and other professionals could expect to encounter in their professional careers. The primary focus is to provide students with the basic tools to understand and interact with lawyers. Offered Fall. Cross-listed with MECH 499. Instructor(s): Spanos; Warden

# MATH (MATHEMATICS)

## School of Natural Sciences/Mathematics

### **MATH 101 SINGLE VARIABLE CALCULUS I (3)**

Differentiation, extreme, Newton's method, integration, fundamental theorem of calculus, area, volume, natural logarithm, exponential, arc length, surface area, Simpson's rule, L'Hopital's rule. May substitute MATH 111-112 or take MATH 101 after completing MATH 111.

### **MATH 102 SINGLE VARIABLE CALCULUS II (3)**

Continuation of MATH 101. Includes further techniques of integration, as well as infinite sequences and series, tests for convergence, power series, radius of convergence, polar coordinates, parametric equations, and arc length.

### **MATH 111 FUNDAMENTAL THEOREM OF CALCULUS (3)**

Study of calculus, forming with MATH 112 a slower-paced version of MATH 101/102. Contains less detail in the coverage of infinite series. Students may take MATH 111/112 followed by MATH 102, or MATH 111 followed by MATH 101/102.

### **MATH 112 CALCULUS AND ITS APPLICATIONS (3)**

Continuation of the study of calculus from MATH 111.

### **MATH 211 ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA (3)**

Study of ordinary differential equations (e.g., solutions to separable and linear first-order equations and to higher-order linear equations with constant coefficients, the properties of solutions to differential equations, and numerical solution methods) and linear algebra (e.g., vector spaces and solutions to algebraic linear equations, dimension, eigenvalues, and eigenvectors of a matrix), as well as the application of linear algebra to first-order systems of differential equations and the qualitative theory of nonlinear systems and phase portraits. Use of the computers in OwlNet as part of each homework assignment required.

### **MATH 212 MULTIVARIABLE CALCULUS (3)**

Study of gradient, divergence, and curl, Lagrange multipliers, multiple integrals, as well as line integrals, conservative vector fields, Green's theorem, Stokes's theorem, and Gauss's theorem. May substitute Math 221 and 222. Course equivalency: MATH 222.

### **MATH 221 HONORS CALCULUS III (3)**

This course and MATH 222 include the material of MATH 212 and much more. Topology of  $R^n$ , calculus for functions of several variables, linear and multilinear algebra, theory of determinants, inner product spaces, integration on manifolds.

### **MATH 222 HONORS CALCULUS IV (3)**

See MATH 221. A student may not receive credit for both MATH 222 and MATH 212. Course equivalency: MATH 212.

### **MATH 300 TOPICS IN UNDERGRADUATE MATH (3)**

Treatment of topics in undergraduate mathematics with an emphasis on writing of clear, cogent compete mathematical proofs. Topics vary by year. May be repeated for credit with permission of department. Prerequisite: MATH 102 Pre-requisite(s): MATH 102.

### **MATH 321 INTRODUCTION TO ANALYSIS I (3)**

A thorough treatment of basic methods of analysis such as metric spaces, compactness, sequences and series of functions. Also, further topics in analysis, such as Hilbert spaces, Fourier series, Sturm-Liouville theory. Pre-requisite(s): MATH 221, or permission of department.

### **MATH 322 INTRODUCTION TO ANALYSIS II (3)**

See MATH 321. Includes proofs of the basic results for multivariable calculus (MATH 321 provides proofs for single-variable calculus). Pre-requisite(s): MATH 321 or permission of instructor.

### **MATH 354 HONORS LINEAR ALGEBRA (3)**

Systems of linear equations, matrices, vector spaces, linear transformations, eigenvalues, canonical forms, inner product spaces, bilinear and quadratic forms. Content is similar to that of MATH 355, but with more emphasis on theory. The course will include instruction on how to construct mathematical proofs. This course is appropriate for potential Mathematics majors and others interested in learning how to construct rigorous mathematical arguments. Course equivalency: MATH 355. Recommend a 200level math class. URL: <http://math.rice.edu/~cochran>.

### **MATH 355 LINEAR ALGEBRA (3)**

Linear transformations and matrices, solution of linear equations, eigenvalues and eigenvectors, quadratic forms, Jordan canonical form. Course equivalency: MATH 354.

### **MATH 356 ABSTRACT ALGEBRA I (3)**

Group theory: normal subgroups, factor groups, Abelian groups, permutations, matrix groups, and group action.

### **MATH 365 NUMBER THEORY (3)**

Properties of numbers depending mainly on the notion of divisibility. Continued fractions. Offered alternate years.

**MATH 366 GEOMETRY (3)**

Topics chosen from Euclidean, spherical, hyperbolic, and projective geometry, with emphasis on the similarities and differences found in various geometries. Isometries and other transformations are studied and used throughout. The history of the development of geometric ideas is discussed. This course is strongly recommended for prospective high school teachers.

**MATH 368 TOPICS IN COMBINATORICS (3)**

Study of combinatorics and discrete mathematics. Topics that may be covered include graph theory, Ramsey theory, finite geometries, combinatorial enumeration, combinatorial games. Repeatable for Credit.

**MATH 381 INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS (3)**

Laplace transform: inverse transform, applications to constant coefficient differential equations. Boundary value problems: Fourier series, Bessel functions, Legendre polynomials.

**MATH 382 COMPLEX ANALYSIS (3)**

Study of the Cauchy integral theorem, Taylor series, residues, as well as the evaluation of integrals by means of residues, conformal mapping, and application to two-dimensional fluid flow. May not receive credit for this course and MATH 427. Course equivalency: MATH 427.

**MATH 390 UNDERGRADUATE COLLOQUIUM (1)**

Lectures by undergraduate students on mathematical topics not usually covered in other courses. Presentation of one lecture and attendance at all sessions required. Repeatable for Credit.

**MATH 401 DIFFERENTIAL GEOMETRY (3)**

Study of the differential geometry of curves and surfaces in  $R^3$ . Includes an introduction to the concept of curvature and thorough treatment of the Gauss-Bonnet theorem.

**MATH 402 DIFFERENTIAL GEOMETRY (3)**

Introduction to Riemannian geometry. Content varies from year to year. Pre-requisite(s): MATH 401. Repeatable for Credit.

**MATH 410 CALCULUS OF VARIATIONS (3)**

Study of classical and modern theories about functions having some integral expression, which is maximal, minimal, or critical. Geodesics, brachistochrone problem, minimal surfaces, and numerous applications to physics. Euler-Lagrange equations, 1st and 2nd variations, Hamilton's Principle. Prerequisite(s): MATH 211 and MATH 212. Instructor(s): De Pauw

**MATH 423 PARTIAL DIFFERENTIAL EQUATIONS (3)**

Wave equation, Laplace's equation, heat equation. Fundamental solutions. Other topics include first order hyperbolic systems, Cauchy-Kowalewski theorem, potential theory, Dirichlet and Neumann problems, elliptic equations, elliptic equations.

**MATH 424 PARTIAL DIFFERENTIAL EQUATIONS (3)**

Continuation of MATH 423. Pre-requisite(s): MATH 423. Repeatable for Credit.

**MATH 425 INTEGRATION THEORY (3)**

Lebesgue theory of measure and integration.

**MATH 426 TOPICS IN REAL ANALYSIS (3)**

Content varies from year to year. May include Fourier series, harmonic analysis, probability theory, advanced topics in measure theory, ergodic theory, and elliptic integrals. Pre-requisite(s): MATH 425. Repeatable for Credit.

**MATH 427 COMPLEX ANALYSIS (3)**

Study of the Cauchy-Riemann equation, power series, Cauchy's integral formula, residue calculus, and conformal mappings. Emphasis on the theory. Course equivalency: MATH 382.

**MATH 428 TOPICS IN COMPLEX ANALYSIS (3)**

Special topics include Riemann mapping theorem, Runge's Theorem, elliptic function theory, prime number theorem, Riemann surfaces, et al. Pre-requisite(s): MATH 382 or MATH 427. Repeatable for Credit.

**MATH 435 DYNAMICAL SYSTEMS (3)**

Existence and uniqueness for solutions of ordinary differential equations and difference equations, linear systems, nonlinear systems, stability, periodic solutions, bifurcation theory. Cross-listed with CAAM 435. Pre-requisite(s): MATH 211 and CAAM 335 or MATH 355 and CAAM 401 or MATH 321.

**MATH 443 GENERAL TOPOLOGY (3)**

Study of basic point set topology. Includes a treatment of cardinality and well ordering, as well as metrization.

**MATH 444 GEOMETRIC TOPOLOGY (3)**

Introduction to algebraic methods in topology and differential topology. Elementary homotopy theory. Covering spaces. Pre-requisite(s): MATH 443, or permission of department.

**MATH 445 ALGEBRAIC TOPOLOGY (3)**

Introduction to the theory of homology. Includes simplicial complexes, cell complexes and cellular homology and cohomology, as well as manifolds, and Poincare duality. Pre-requisite(s): MATH 444.

**MATH 463 ABSTRACT ALGEBRA II (3)**

Ring theory: ideals, polynomials, factorization. Advanced linear algebra: quadratic forms, canonical forms. Field theory: extensions, Galois theory, solvability in radicals. Continuation of MATH 356. Prerequisite(s): MATH 356 or permission of instructor.

**MATH 464 ALGEBRA II (3)**

Continuation of MATH 463. Advanced topics may include representations of finite groups, modules, commutative algebra, and homological algebra. Pre-requisite(s): MATH 463 or permission of instructor.

**MATH 465 TOPICS IN ALGEBRA (3)**

Content varies from year to year. Repeatable for Credit.

**MATH 466 TOPICS IN ALGEBRA II (3)**

Content varies from year to year.

**MATH 468 POTPOURRI (3)**

This course deals with miscellaneous special topics not covered in other courses. Repeatable for Credit.

**MATH 490 SUPERVISED READING (1 TO 6)**

Repeatable for Credit.

**MATH 499 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 3)**

Cross-listed with CAAM 499, STAT 499. Graduate/Undergraduate version: MATH 699. Repeatable for Credit.

**MATH 501 TOPICS IN DIFFERENTIAL GEOMETRY (3)**

Topic to be announced. Repeatable for Credit.

**MATH 521 ADVANCED TOPICS IN REAL ANALYSIS (3)**

Topic to be announced. Repeatable for Credit.

**MATH 522 TOPICS IN ANALYSIS (3)**

Topic to be announced. Repeatable for Credit.

**MATH 523 FUNCTIONAL ANALYSIS (3)**

Topic to be announced. Repeatable for Credit.

**MATH 527 ERGODIC THEORY AND TOPOLOGICAL DYNAMICS (3)**

Topic to be announced.

**MATH 528 ERGODIC THEORY AND TOPOLOGICAL DYNAMICS (3)****MATH 541 TOPICS IN TOPOLOGY (3)**

Topic to be announced. Repeatable for Credit.

**MATH 542 TOPICS IN ADVANCED TOPOLOGY (3)**

Topic to be announced. Repeatable for Credit.

**MATH 567 TOPICS IN ALGEBRAIC GEOMETRY (3)**

Possible topics include rational points on algebraic varieties, moduli spaces, deformation theory, and Hodge structures. Recommended prerequisite(s): Mathematics 463 - 464. Repeatable for Credit. Instructor(s): Hassett.

**MATH 590 CURRENT MATHEMATICS SEMINAR (1)**

Lectures on topics of recent research in mathematics delivered by mathematics graduate students and faculty. Repeatable for Credit.

**MATH 591 GRADUATE TEACHING SEMINAR (1)**

Discussion on teaching issues and practice lectures by participants as preparation for classroom teaching of mathematics. Repeatable for Credit.

**MATH 699 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 9)**

Cross-listed with CAAM 699, STAT 699. Graduate/Undergraduate version: MATH 499. Repeatable for Credit.

**MATH 777 VISITING RESEARCH TRAINEE (0)****MATH 800 THESIS AND RESEARCH (1 TO 15)**

Repeatable for Credit.

**MDST (MEDIEVAL STUDIES)****School of Humanities/Medieval Studies****MDST 101 ELEMENTARY LATIN I (3)**

Study of the fundamentals of Latin grammar with emphasis on acquisition of reading skills. Cross-listed with LATI 101.

**MDST 102 ELEMENTARY LATIN II (3)**

Continuation of MDST 101. Cross-listed with LATI 102.

**MDST 104 CASE STUDIES IN ANCIENT AND MEDIEVAL ARCHITECTURE (3)**

This course offers an introduction to the history of Western art and architecture through weekly case studies of some of the most important public and private buildings in antiquity and the Middle Ages: from the Parthenon to a Roman house, Carnavan Castle to Chartres Cathedral. Topics explored throughout the course include the construction of imperial authority, ritual and the formation of space, and the relationship between structure and design. Cross-listed with ARCH 104, HART 104. Instructor(s): Neagley; Quenomoen.

**MDST 108 ART IN CONTEXT: LATE MEDIEVAL AND RENAISSANCE CULTURE (3)**

This course will be concerned with art, architecture, and history of the late Middle Ages and Renaissance. We will employ historical texts, literature, and illustrations of works of art, showing how historical documents and sources can illuminate the cultural context of art and architecture. Cross-listed with HART 240, HUMA 108. Instructor(s): Manca; Neagley.

**MDST 111 INTRODUCTION TO THE HISTORY OF WESTERN ART I: PREHISTORIC TO GOTHIC (3)**

A survey of painting, sculpture, and architecture from the Paleolithic period through the 15th century. Cross-listed with HART 101. Instructor(s): Neagley; Quenomoen.

**MDST 126 THE LEGEND OF KING ARTHUR IN THE MIDDLE AGES (3)**

In the 1100s, people began writing down stories of Arthur, Guinevere, Merlin, and the Knights of the round table using sophisticated techniques of literary composition. Today, these stories count among the great writings of Europe. This course examines the spectrum of medieval stories and histories of Arthur that arose in England, France, and Germany from the beginning to the age of printing, plus some recent revivals. Cross-listed with FSEM 126, GERM 126. Must be in one of the following Classification(s): Freshman. Instructor(s): Westphal.

**MDST 201 HISTORY OF PHILOSOPHY I (3)**

Survey of the major philosophers and philosophical systems of ancient Greece, from Parmenides to the Stoics. Cross-listed with CLAS 201, PHIL 201. Instructor(s): Morrison.

**MDST 202 INTRODUCTION TO MEDIEVAL CIVILIZATION I: THE EARLY MIDDLE AGES (3)**

Introduction to European culture of the "Dark Ages," from the fall of Rome to the end of Viking invasions. Includes the use of historical, literary, artistic, and archaeological sources to trace changes in European material, spiritual, and cultural life between 300-1000 A.D. Cross-listed with HIST 202. Not offered this academic year. Instructor(s): Haverkamp.

**MDST 203 INTRODUCTION TO MEDIEVAL CIVILIZATION II: THE HIGH MIDDLE AGES (3)**

European culture from the year 1000 to the discovery of the Americas, which encompasses the Crusades, the "discovery of the individual," chivalry and chivalric literature, the Black Death, and the beginnings of the Age of Exploration. Cross-listed with HIST 203. Offered Fall. Instructor(s): Haverkamp.

**MDST 211 INTERMEDIATE LATIN I: PROSE (3)**

Review of grammar and readings in Latin prose. Cross-listed with LATI 201.

**MDST 212 INTERMEDIATE LATIN II (3)**

Readings in Vergil's Aeneid. Cross-listed with LATI 202.

**MDST 222 MEDIEVAL AND RENAISSANCE ERAS (3)**

Introduction to the study of Western music history, with emphasis on music before 1600. Score reading ability required. Cross-listed with MUSI 222. Pre-requisite(s): MUSI 211 or MUSI 317. Instructor(s): Loewen.

**MDST 223 MEDIEVAL EMPIRES (3)**

Course will explore the political, social, and economic conceptions of the Byzantine and Holy Roman Empires. Examining the self-perceptions of the Empire; the role of Roman tradition and languages; notions of (geographical) borders and nations; different constitutions in political representation, administrations, and economic organization. Cross-listed with HIST 223. Offered Spring. Instructor(s): Haverkamp.

**MDST 230 MEDIEVAL ART AND LITERATURE (3)**

This course will focus on major themes represented in a selected number of works in art and literature from the Middle Ages. Cross-listed with HART 230. Instructor(s): Neagley.

**MDST 257 JEWS AND CHRISTIANS IN MEDIEVAL EUROPE (3)**

Course will study relationships between Jewish and Christian communities within the context of Christian Europe. Topics will include settlement and demography; economics; legal status; hostility against Jews; family and the position of women; communal organizations; social diversity; and intellectual and spiritual achievements. Offered with additional work as MDST 357. Cross-listed with HIST 257. Course equivalency: MDST 357. Not offered this academic year. Instructor(s): Haverkamp.



**MDST 281 THE MIDDLE EAST FROM THE PROPHET MUHAMMAD TO SULAYMAN THE MAGNIFICENT (3)**

Introduction to the Middle East from the rise of Islam to the middle of the 16th century. Topics include conquests and classical Islamic states, Arabization, Jewish and Christian communities, impact of Turkic peoples, and the Ottoman Empire, with emphasis on social, cultural, political, and religious trends, which shaped the region's history. Cross-listed with HIST 281. Offered Fall. Instructor(s): Sanders.

**MDST 300 MEDIEVAL WOMEN WRITERS (3)**

This course will examine the most significant Medieval European women authors from the tenth through the seventeenth centuries. We will combine close reading with a focus on intertextuality to recover a feminized literary tradition. Cross-listed with ENGL 311, SWGS 300. URL: <http://www.ruf.rice.edu/~jchance/mewom.htm>. Instructor(s): Chance.

**MDST 301 ANCIENT AND MEDIEVAL PHILOSOPHY (3)**

Topics in history of philosophy from the fourth century B.C. through the fourteenth. Cross-listed with CLAS 301, PHIL 301. Instructor(s): Morrison.

**MDST 308 THE WORLD OF LATE ANTIQUITY (3)**

Study of the social, religious, and political history of the Roman world from the Diocletian to the rise of Islam, with emphasis on the breaking of the unity of the Mediterranean world and the formation of Byzantine society in the Greek east. Cross-listed with HIST 308. Not offered this academic year. Instructor(s): Maas.

**MDST 310 DANTE (3)**

A close reading of Dante's Divine Comedy, with attention to the meaning of words, images, symbols, figures, structures, and the epic itself, with reference to the political/religious controversies of the time in Florence, Italy, and medieval Europe. Cross-listed with ENGL 310. Offered Spring. URL: <http://www.ruf.rice.edu/~jchance/dante.pdf>. Instructor(s): Chance.

**MDST 311 OLD ENGLISH (3)**

This course will be a combination of Old English Grammar and readings in Old English.

**MDST 313 BEOWULF (3)**

A reading of the beginning, the death and the funeral of Beowulf in Old English. Recommended prerequisite(s): Old English Grammar or instructor permission.

**MDST 315 MEDIEVAL CULTURES THROUGH FILM (4)**

Interdisciplinary course exploring the literature, art, philosophy, history, music, and science of the Middle Ages, with films by Pasolini, Bergman, Dreyer, Annaud, Vigne, and others, and highlighted by a medieval banquet. Cross-listed with ENGL 315. URL: [www.ruf.rice.edu/~jchance/med\\_cult.html](http://www.ruf.rice.edu/~jchance/med_cult.html). Instructor(s): Chance.

**MDST 316 CHAUCER (3)**

Chaucer and his literary cultural, and philosophical background. Readings include minor poems, a dream vision, The Canterbury Tales and Troilus and Criseyde. Cross-listed with ENGL 316, SWGS 305. URL: [www.ruf.rice.edu/~jchance/chaucer3.html](http://www.ruf.rice.edu/~jchance/chaucer3.html). Instructor(s): Chance.

**MDST 317 ARTHURIAN LITERATURE (3)**

A survey of the origins and development of the Arthurian legend from the earliest chronicles in the sixth century and later medieval French, Welsh, Irish, and English Arthurian poems to modern adaptations of Arthurian material, including films. Cross-listed with ENGL 317. Offered Fall. URL: [www.ruf.rice.edu/~jchance/arthurian.htm](http://www.ruf.rice.edu/~jchance/arthurian.htm). Instructor(s): Chance.

**MDST 318 J.R.R. TOLKIEN AND THE MIDDLE AGES (3)**

This course will examine Tolkien's awareness of medieval works such as Beowulf, The Battle of Maldon, The Wanderer, old English Riddles, Sir Galvain and the Green Knight, and the Finnish Kalevala in his scholarship and fiction, including The Hobbit, The Lord of the Rings, and the Silmarillion. Cross-listed with ENGL 318. URL: <http://www.ruf.rice.edu/~jchance/tol2006.pdf>. Instructor(s): Chance.

**MDST 320 DIRECTED READING IN MEDIEVAL STUDIES (1 TO 3)**

Student works one-on-one with an individual faculty member on a topic directly related to Medieval Studies. Instructor permission required. Offered Spring.

**MDST 323 MEDIEVAL EMPIRES (3)**

Enriched version of MDST 223. May not receive credit for both MDST 223 and MDST 323. Cross-listed with HIST 323. Offered Spring. Instructor(s): Haverkamp.

**MDST 330 EARLY MEDIEVAL ART (3)**

Study of medieval art, with emphasis in part one on the art and architecture produced in Europe during the Dark Ages (e.g. the work of the Visigoths, Celts, Anglo-Saxons, Merovingians, Carolingians, and Ottonians); and in part 2 on the major revival of art and architecture in the medieval monasteries of the Romanesque period. Cross-listed with HART 330. Instructor(s): Neagley.

**MDST 331 GOTHIC ART AND ARCHITECTURE IN NORTHERN EUROPE, 1140-1300: THE AGE OF CATHEDRALS (3)**

Examination of the full array of sacred and secular art and architecture produced in the early and high gothic periods in northern Europe. Includes cathedral architecture, sculpture, stained glass, manuscripts, and metalwork studied in relationship to the expansion of royal and Episcopal power. Cross-listed with HART 331. Instructor(s): Neagley.

**MDST 332 LATE GOTHIC ART AND ARCHITECTURE IN NORTHERN EUROPE, 1300-1500 (3)**

Examination of art and architecture produced in the late gothic period within three distinct settings—the court, the city, and the church. Includes private, public, and religious life as expressed in the objects, architecture, and decoration of the castle and palace, the house, city hall and hospital, and the chapel and parish church. Cross-listed with HART 332. Instructor(s): Neagley.

**MDST 335 MAPPING GERMAN CULTURE: COURTSHIP, LOVE AND MARRIAGE IN THE AGE OF CHIVALRY (3)**

The literature of the High Middle Ages is the first since antiquity to probe the hazards and potentials of romance between men and women, as well as single-sex friendship and love. This course will show how the literary ideal of love emerged in a society that was torn apart by war and rivalry. The poems and stories we will read belong to the treasures of medieval literature from the German lands. Taught in English with a possible FLAC section. Cross-listed with GERM 330, HUMA 330, SWGS 330. Instructor(s): Westphal.

**MDST 345 RENAISSANCE EUROPE (3)**

Exploration of major cultural developments in Western Europe from the rise of Italian humanism in the 14th century to European conquest and expansion in the 16th century. Cross-listed with HIST 345. Offered Fall.

**MDST 357 JEWS AND CHRISTIANS IN MEDIEVAL EUROPE (3)**

Enriched version of MDST 257. May not receive credit for both MDST 257 and HIST 357. Cross-listed with HIST 357. Course equivalency: MDST 257. Instructor(s): Haverkamp.

**MDST 358 EARLY EUROPEAN INTELLECTUAL HISTORY FROM AUGUSTINE TO DESCARTES (3)**

This course will survey key developments in Western thought (political theory, literature, philosophy, theology, and art) from the consolidation and institutionalization of Christian doctrine in the fourth and fifth centuries through the beginning of the "Scientific Revolution" in the 17th century. Cross-listed with HIST 358. Not offered this academic year. Instructor(s): Quillen.

**MDST 368 MYTHOLOGIES (3)**

The interdisciplinary course introduces students to world mythologies, mythmakers, and their cultures, from the beginnings to the modern period. Include mythologies: Babylonian, Sumerian, Hindu, Egyptian, Greek, Roman, Irish, Babylonian, Sumerian, Hindu, Egyptian, Greek, Roman, Irish, Old Norse, Anglo-Saxon, Finnish, Mayan, Hopi, and modern Old Norse, Anglo-Saxon, Finnish, Mayan, Hopi, and modern (Glass Borges, Whale Rider). (Glass Borges, Whale Rider). Cross-listed with ENGL 309, SWGS 368. Offered Fall. URL: [www.ruf.rice.edu/~jchance/myth.htm](http://www.ruf.rice.edu/~jchance/myth.htm). Instructor(s): Chance.

**MDST 370 INTRODUCTION TO TRADITIONAL CHINESE POETRY (3)**

This course seeks to decode enchanting features of traditional Chinese poetry through examining the transformation of poetic genres, the interaction between poetic creation and political, social and culture changes, and the close association of poetry with art. Thus, this course also serves to understand Chinese culture and history through poetic perspectives. All readings in English translation. Cross-listed with ASIA 330, CHIN 330. Instructor(s): Qian.

**MDST 375 INTRODUCTION TO CLASSICAL CHINESE LITERATURE (3)**

Examination of the basic characteristics of classical Chinese novels, primarily through six important works from the 16th to 18th centuries: Water Margin, Monkey, Golden Lotus, Scholars, Romance of the Three Kingdoms, and Dream of the Red Chamber. Cross-listed with ASIA 335, CHIN 335. Instructor(s): Qian.

**MDST 379 WOMEN IN CHINESE LITERATURE (3)**

This course examines women's roles in Chinese Literature as writers, readers, and characters, focusing particularly on the tension between women's lived bodily experiences and the cultural experiences inscribed on the female body and how, in the process, women have contrarily gendered patriarchal culture into their own. It will also touch on Chinese women's incorporation of the Western Tradition. Cross-listed with ASIA 399, SWGS 399. Instructor(s): Qian.

**MDST 382 CLASSICAL ISLAMIC CULTURES (3)**

An introduction to the cultures and religions of the Islamic world from the 9th through the 14th centuries. Topics include Islamic law and theology, philosophy, ritual, Islamic science and medicine, classical Arabic literature, the impact of Arabo-Islamic culture on Jewish and Christian cultures of the Islamic world. Cross-listed with HIST 382. Not offered this academic year. Instructor(s): Sanders.

**MDST 402 MIDDLE HIGH GERMAN (3)**

An introduction to the phonology and morphology of Middle High German, such as will prepare students to read 'Tristan', 'Parzifal', and the 'Nibelungenlied', as well as the great lyric poets of that period. Emphasis will be on pronunciation and grammatical distinctions between Middle High and Modern High German as well as on the diverging semantic developments of the two vocabularies. Offered Spring.

**MDST 404 BEGINNINGS OF THE LANGUAGE AND LITERATURE OF FRANCE (3)**

This course includes an external history of the French language, an examination of hagiographic literature and the *chanson de geste* in their cultural and artistic contexts, as well as bibliographic component to acquaint the students with library tools available for research emphasizing medieval resources but not excluding those for later periods. Students will acquire a reading knowledge of Old French. Course taught in French. Cross-listed with FREN 404. Recommended: Prerequisite(s): At least two upper-level French courses. Instructor(s): Nelson-Campbell.

**MDST 411 THE LITERARY AND HISTORICAL IMAGE OF THE MEDIEVAL WOMAN (3)**

Comparison and contrast of the presentation of the medieval woman in literature with extant evidence of historical women from contemporary documents and records. Graduate/Undergraduate version: FREN 510. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Instructor(s): Nelson-Campbell.

**MDST 425 COURTLY LOVE IN MEDIEVAL FRANCE (3)**

Undergraduate version of FREN 515. Study of the Occitan and Old French poetry that served as the source of the kind of love that came to be called "amour courtois" in the 19th century. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Instructor(s): Nelson-Campbell.

**MDST 427 TOPICS IN EARLY MUSIC (3)**

Limited enrollment. Instructor(s): Wallace.

**MDST 429 MUSIC OF THE MIDDLE AGES (3)**

A study of the major musical styles and composers of western art music before 1400 and their historical, cultural, and sociological contexts. Cross-listed with MUSI 429. Offered Fall.

**MDST 431 ARCHITECTURE OF THE GOTHIC CATHEDRAL FROM THE MIDDLE AGES TO THE TWENTIETH CENTURY (3)**

This course will focus on one of the most important contributions to the history of western architecture—the Gothic cathedral. The course will approach the material from a number of different perspectives—the formal and technical development of Gothic architecture; the Medieval architect and the design of Gothic buildings; the social, economic, and political history of "big church" building in the Middle Ages; Gothic architecture as experience and metaphor; and the afterlife of the Gothic cathedral from Vasari to the National Cathedral in Washington, D.C. Cross-listed with HART 431. Instructor(s): Neagley.

**MDST 434 FROM BEOWULF TO THE BAYEUX TAPESTRY: ART AND LITERATURE OF THE ANGLO-SAXON WORLD (3)**

This interdisciplinary course will focus on major literary and artistic works produced in the British Isles from the end of Roman Britain to the Norman conquest. We will examine the intersection of pictorial and textual themes around important works such as Beowulf and the ship burial at Sutton Hoo or the Song of Roland the epic pictorial narrative of the Battle of Hastings in the Bayeux Tapestry. Cross-listed with HART 434. Instructor(s): Neagley.

**MDST 436 LITERATURE AND CULTURE OF THE MIDDLE AGES: KING ARTHUR (3)**

Examination of the origins of the legend of King Arthur and reasons for its popularity, particularly in literature of the French Middle Ages, but also in other medieval literatures of Western Europe. Includes discussion of the legend's influence in diverse areas even in modern times. Cross-listed with FREN 416. Pre-requisite(s): FREN 311 or FREN 312, or placement test or permission of instructor. Instructor(s): Nelson-Campbell.

**MDST 438 WOMEN, GENDER, AND SEXUALITY IN MEDIEVAL ISLAMIC SOCIETIES (3)**

Examination of some features of the legal position and social realities of men and women in the Islamic world, with emphasis on how boundaries of gender have traditionally been drawn. Includes the family and sexual ethics, the harem, polygyny, divorce, and eunuchs (who played an important role in both the military and in certain religious institutions). Cross-listed with HIST 438, SWGS 455. Limited enrollment. Not offered this academic year. Instructor(s): Sanders.

**MDST 440 JAN VAN EYCK: PROBLEMS OF INTERPRETATION (3)**

Seminar and in-depth research on the art and historiography of the early Netherlandish painter Jan Van Eyck. Cross-listed with HART 440. Instructor(s): Neagley.

**MDST 444 MEMORY AND COMMEMORATION IN THE MIDDLE AGES (3)**  
Memory and commemoration are the intentions, attitudes, acts, and media that should prevent oblivion of individuals and communities (beyond death). Possessing universal dimensions that go back to antiquity, in the present they are often driven into individual remembrance, the institutional realm of politics, or the secluded world of museums. Cross-listed with HIST 444. Not offered this academic year. Instructor(s): Haverkamp.

**MDST 446 MEDIEVAL WOMEN (3)**  
Many aspects of today's life for women go back to developments in Medieval times. Seminar explores the freedom and restrictions of women from different religions, queens and nobles, merchants to prostitutes, in families and monasteries. Participation may also include a trip to significant sights in Germany. Cross-listed with HIST 446. Offered Fall. Instructor(s): Haverkamp.

**MDST 447 THE AGE OF CRUSADES (3)**  
Seminar will discuss characteristics of the Crusades against Muslims, Jews, pagans, Mongols, heretics, schismatics, and political enemies and explore to what extent the concepts of "holy war" and new expressions of religious beliefs created fundamentalism and new possibilities for globalization in medieval Europe. Discussions will include primary and secondary sources. Cross-listed with HIST 447. Not offered this academic year. Instructor(s): Haverkamp.

**MDST 451 BOSCH AND BRUEGEL (3)**  
The Sacred and Profane in the Paintings of Bosch and Bruegel. The obscene, the grotesque, the humorous, and the bizarre were frequently depicted alongside sacred religious scenes in the margins of late Medieval manuscripts or the periphery of Gothic cathedral facade sculpture. By the sixteenth century, this fantastic world had migrated to the center of religious paintings, especially in the work of Hieronymus Bosch and Pieter Bruegel the Elder. This course will examine the juxtapositions and the complex meanings of sacred and profane imagery within the context of sixteenth-century religious and social life. Cross-listed with HART 441. Instructor(s): Neagley.

**MDST 456 COLLEGIUM (1)**  
Performance of music up to the early 17th century. Does not count as chamber music. Instructor permission required. Repeatable for Credit.

**MDST 478 MEDIEVAL STUDIES (3)**  
Special Topics in medieval Europe comparative literature. Topic for 2007-08 was "THE MEDIEVAL DREAM AND VISION." Repeatable for Credit. Instructor(s): Chance.

**MDST 481 SEMINAR IN ANCIENT AND MEDIEVAL PHILOSOPHY (3)**  
Graduate/Undergraduate version: PHIL 501. Instructor(s): Morrison.

**MDST 486 ILLUMINATED MUSIC MANUSCRIPTS (3)**  
The study of illuminated music manuscripts from the Middle Ages through the mid-sixteenth century, with discussion of changed in production, design, decoration, and function throughout this period. Non-music manuscripts will also be examined in order to place music collections in the context of contemporary manuscript culture. Graduate/Undergraduate version: MUSI 726. Limited enrollment.

**MDST 488 TOPICS IN MEDIEVAL HISTORY (3)**  
Research seminar on selected issues, subject or themes in medieval history. Topics vary. Cross-listed with HIST 488. Repeatable for Credit. Not offered this academic year. Instructor(s): Haverkamp.

## MECH (MECHANICAL ENGINEERING)

### School of Engineering/Mechanical Engineering & Materials Science

**MECH 200 CLASSICAL THERMODYNAMICS (3)**  
Explication of the fundamental laws of classical thermodynamics and deductions from them. Includes applications with particular attention to pure substances. Required for mechanical engineering majors. Pre-requisite(s): PHYS 101 and PHYS 102. Offered Spring. Instructor(s): Houchens.

**MECH 211 ENGINEERING MECHANICS (3)**  
The study equilibrium of static systems, the dynamics of a particle and particle systems, and rigid-body dynamics. Includes elements of vibrational analysis. Required for mechanical engineering and materials science and engineering majors. Cross-listed with CEVE 211. Pre-requisite(s): PHYS 101 and MATH 101 and MATH 102. Offered Fall & Spring. URL: [www.ownet.rice.edu/~mech211](http://www.ownet.rice.edu/~mech211). Instructor(s): Yakobson.

**MECH 299 CURRENT TOPICS/INSTRUMENTATION AND DATA ACQUISITION SYSTEMS (3)**  
This course will offer practical experience in building and using instrumentation and computer based data acquisition systems for laboratory experiments, engineering field sites, and test vehicles. This course will also emphasize the mathematical bases of effective laboratory work. Offered Fall.

**MECH 308 SENIOR DESIGN JUNIOR OBSERVERS (1)**  
Offered Fall & Spring. Instructor(s): O'Malley.

**MECH 311 MECHANICS OF DEFORMABLE SOLIDS (3)**

Analysis of stress and the deformation of solids with applications to beams, circular shafts, and columns. Required for mechanical engineering majors. Cross-listed with CEVE 311. Pre-requisite(s): MECH 211. Offered Spring. Instructor(s): Nagarajaiah.

**MECH 314 MECHANICS AND SPORTS (3)**

Athletic performance is greatly influenced by basic laws of mechanics. The motion of projectiles (including the Magnus effect) has broad application, as does the mechanics of impact. Other important topics include biomechanics of human performance, limits and records, development of optimal strategies and design of regulation of sports equipment. Graduate/Undergraduate version: MECH 534. Pre-requisite(s): PHYS 101. Limited enrollment. Offered Spring. Instructor(s): Carroll.

**MECH 331 JUNIOR LABORATORY I (1)**

Instruction in static and impact testing of engineering materials. Includes beam deflection and shear center experiments, as well as the application and testing of strain gauges. Required for mechanical engineering majors in B.S. program. Offered Spring.

**MECH 332 JUNIOR LABORATORY II (1)**

Instruction in fluid mechanics and thermodynamics. Students work in groups and perform classic experiments in fluid flow with emphasis on boundary-layer theory, flow separation, laminar to turbulent transition, and Bernoulli equation. This laboratory course provides experimental support to MECH 371. Required course for mechanical engineering majors in B.S. program. See on-line registration for sections. Limited enrollment. Offered Spring. Instructor(s): McStravick.

**MECH 340 INDUSTRIAL PROCESS LAB (1)**

Practical experience in, and observation of, selected industrial processes. Must sign up in department office at the beginning of registration for sections; each section is limited to 8 students. Open only to mechanical engineering majors. Required for mechanical engineering majors in B.S. program. Final registration confirmed after the first week's organizational meeting. Meeting announcements posted in the MEMS department. Must be enrolled in one of the following Major(s): Mechanical Engineering. Limited enrollment. Offered Fall & Spring. Instructor(s): Gesenhues.

**MECH 343 MODELING OF DYNAMIC SYSTEMS (4)**

Energy-based modeling of dynamic systems. The focus of the course will be mechanical systems and electrical circuits, but will also involve fluid, thermal and other domains. Various techniques such as signal flow graphs and Bond Graphs will be introduced. Modeling and simulation of systems via MATLAB, and an introduction to systems theory. Includes laboratory assignments. Required for mechanical engineering majors in B.S. program. Pre-requisite(s): MECH 211 and MECH 200 and MATH 211. Recommended co or prerequisite(s): CAAM 335. Offered Fall. URL: [www.owl.net.rice.edu/~mech343](http://www.owl.net.rice.edu/~mech343). Instructor(s): O'Malley.

**MECH 371 FLUID MECHANICS I (3)**

Introduction to fluid statics and dynamics. Includes the development of the fundamental equations of fluid mechanics and their application to problems of engineering interest. Required for mechanical engineering majors in B.S. program. Cross-listed with CEVE 371. Pre-requisite(s): MECH 200 and MECH 211 and MATH 212. Offered Fall. URL: [www.owl.net.rice.edu/~mech371](http://www.owl.net.rice.edu/~mech371). Instructor(s): Meade.

**MECH 373 ACOUSTICS (3)**

Basics of technical acoustics, including generation, propagation, reception and reproduction of sound, speech and hearing, musical and architectural acoustics, and noise control. Offered alternate years. Instructor(s): Carroll.

**MECH 380 INTRODUCTION TO MECHANICAL EFFECTS IN TISSUES (3)**

Development of a general background in physiology and in advanced mechanics for applications in medicine. Includes bone mechanics in remodeling, cartilage and ligament mechanics, and muscle mechanics, as well as an on paper design project on a subject selected by students. Pre-requisite(s): MECH 211 and MECH 311 or CEVE 300.

**MECH 383 INTRODUCTION TO BIOMEDICAL INSTRUMENTATION AND MEASUREMENT TECHNIQUES (3)**

Review of basic sensors, measurement principles and analog electronics using operational amplifiers. Includes design problems using operational amplifier circuits (e.g. instrumentation and isolation amplifiers, comparators, timer circuits). Introduction to development of virtual instruments (VIs) using LabView. Discussion of micro and macro-biopotential electrodes, cell cytometry, the measurement of blood pressure, blood flow, and heart sounds, temperature, and the principles of electrical safety (e.g. micro and macro-shock hazards in the clinical environment). Includes discussion of pulmonary instrumentation and medical applications of ultrasound. Two lab exercises and a term project required. Pre-requisite(s): ELEC 381 or permission of instructor. Instructor(s): Anvari.

**MECH 400 ADVANCED MECHANICS OF MATERIALS (3)**

Advanced topics in solid mechanics and strength of materials including energy methods, principle of virtual work, pressure vessels, beam vibrations, sound waves in solids, buckling, aspects of elasticity theory and fracture mechanics with application to the design of reliable structures. Pre-requisite(s): MECH 211 and MECH 311. Offered Spring. URL: <http://www.owl.net.rice.edu/~mech400>. Instructor(s): Akin.

**MECH 401 MECHANICAL DESIGN APPLICATIONS (3)**

Brief review of solid mechanics with introduction to failure theories and fatigue analysis. The principles of mechanics are applied to the design of machine elements. A semester design project requires using the analysis tools learned in the course. Required for mechanical engineering majors in B.S. program. Prerequisite(s): MECH 311 or CEVE 300. Offered Spring. URL: [www.owlnet.rice.edu/~mech401/](http://www.owlnet.rice.edu/~mech401/). Instructor(s): McStravick.

**MECH 403 COMPUTER AIDED DESIGN (3)**

Investigation of the integration of the computer into the areas of thermal and mechanical design. Includes such subjects as optimization, finite element, analysis, and commercial software. Required for mechanical engineering majors in B.S. program. Graduate/Undergraduate version: MECH 503. Prerequisite(s): CAAM 210. Offered Fall. URL: [www.owlnet.rice.edu/~mech403/](http://www.owlnet.rice.edu/~mech403/). Instructor(s): Akin.

**MECH 404 MECHANICAL DESIGN PROJECT (4)**

Project based course for group or individual design projects relating to mechanical engineering topics. Instructor permission required. Offered Spring. Instructor(s): McStravick.

**MECH 407 CAPSTONE DESIGN PROJECT I (4)**

An interdisciplinary capstone design experience in mechanical engineering. This course provides an opportunity for students to apply knowledge and skills acquired in previous courses to the solution of a realistic engineering problem. Teams of students will specify, design, and build a system to meet a prescribed set of requirements. The topics covered in this course will include design methodology, effective teamwork, project management, documentation, and presentation skills. Must complete MECH 408 to receive credit for MECH 407. Required for mechanical engineering majors in B.S. program. Offered Fall. URL: [www.owlnet.rice.edu/~mech407](http://www.owlnet.rice.edu/~mech407).

**MECH 408 CAPSTONE DESIGN PROJECT II (3)**

An interdisciplinary capstone design experience in mechanical engineering. This course provides an opportunity for students to apply knowledge and skills acquired in previous courses to the solution of a realistic engineering problem. Teams of students will specify, design, and build a system to meet a prescribed set of requirements. The topics covered in this course will include design methodology, effective teamwork, project management, documentation, and presentation skills. Must complete MECH 408 to receive credit for MECH 407. Required for mechanical engineering majors in B.S. program. Offered Spring. URL: [www.owlnet.rice.edu/~mech407](http://www.owlnet.rice.edu/~mech407).

**MECH 411 DYNAMICS AND CONTROL OF MECHANICAL SYSTEMS (3)**

The application of the principles of kinematics, dynamics and systems and control theory to the design and analysis of controlled mechanical systems. Kinematics and Newtonian dynamics of particles and rigid bodies, elements of analytical dynamics, system analysis, stability, and simulation of dynamical behavior, control of mechanical systems. Demonstrations and laboratory examples. Graduate/Undergraduate version: MECH 501. Pre-requisite(s): MECH 343 and MECH 420. Offered Fall. URL: [www.owlnet.rice.edu/~mech411](http://www.owlnet.rice.edu/~mech411). Instructor(s): Ghorbel.

**MECH 412 VIBRATIONS (3)**

Analysis of discrete and continuous linear vibrating systems, with emphasis on multi-degree-of-freedom systems. Includes approximate methods. Coverage of statistics (e.g. Gaussian and other distributions; and power spectra) as a foundation for random vibrations analysis. Required for mechanical engineering majors in B.S. program. Graduate/Undergraduate version: MECH 502. Pre-requisite(s): MECH 343. Offered Spring. Instructor(s): Spanos.

**MECH 417 FINITE ELEMENT ANALYSIS (3)**

An introduction to finite element analysis by Galerkin's method and the method of least squares as applied to both ordinary and partial differential equations common in engineering applications. Element interpolations, numerical integration, computational considerations for efficient solution and post-processing methods. Application of the commercial codes to ANSYS and Cosmosworks. Cross-listed with CEVE 417. Graduate/Undergraduate version: MECH 517. Pre-requisite(s): MATH 212 and CAAM 210 or CAAM 211. Offered Spring. Instructor(s): Akin.

**MECH 420 FUNDAMENTALS OF CONTROL SYSTEMS (3)**

Linear systems and the fundamental principles of classical feedback control, state variable analysis of linear dynamic systems, stability of linear control systems, time-domain analysis and control of linear systems, root-locus analysis and design and pole-zero synthesis, frequency domain techniques for the analysis and design of control systems. Required for mechanical engineering majors in B.S. program. Cross-listed with ELEC 436. Pre-requisite(s): MECH 343 and CAAM 335. Offered Spring. URL: [www.owlnet.rice.edu/~mech420](http://www.owlnet.rice.edu/~mech420). Instructor(s): Ghorbel.

**MECH 427 MATRIX METHODS IN STRUCTURAL MECHANICS (3)**

Introduction to matrix structural analysis and finite element method, applied to trusses, beams, frames and two dimensional elasticity problems. Use of computer programs for structural analysis of Civil, Mechanical, and Aerospace Structures. Offered Fall. Instructor(s): Nagarajaiah.

**MECH 431 SENIOR LABORATORY I (1)**

Laboratory instruction in heat transfer, thermodynamics, and engine cycles. Students work in small groups doing experiments with emphasis on applied thermodynamics. Sensor technology is also stressed in conjunction with the experimental set up. Required for mechanical engineering majors in B.S. program. See online registration for sections. Offered Fall. Instructor(s): McStravick.

**MECH 435 ELECTROMECHANICAL DEVICES AND SYSTEMS (3)**

Introduction to the physical and engineering aspects of electromechanical sensors and actuators. Includes underlying physical phenomena, practical devices, electrical and mechanical interfacing, and control of electromechanical systems. Cross-listed with ELEC 435. Pre-requisite(s): ELEC 241 or ELEC 242 or ELEC 243. Offered Fall. Instructor(s): Wise.

**MECH 454 COMPUTATIONAL FLUID MECHANICS (3)**

Fundamental concepts of finite element methods in fluid mechanics, including spatial discretization and numerical integration in multi-dimensions, time-integration, and solution of nonlinear ordinary differential equation systems. Advanced numerical stabilization techniques designed for fluid mechanics problems. Strategies for solution of complex, real-world problems. Topics in large-scale computing, parallel processing, and visualization. Cross-listed with BIOE 454, CEVE 454. Graduate/Undergraduate version: MECH 554. Offered Fall. URL: [www.mems.rice.edu/TAFSM/MECH454/](http://www.mems.rice.edu/TAFSM/MECH454/). Instructor(s): Tezduyar.

**MECH 471 APPLICATIONS OF THERMODYNAMICS (3)**

Applications of thermodynamics to various systems of interest in mechanical engineering, with emphasis on energy conversion, refrigeration, and psychometrics. Pre-requisite(s): MECH 200. Offered Fall.

**MECH 473 ADVANCED FLUID MECHANICS I (3)**

Examination of conservation equations for viscous compressible and incompressible fluids. Includes applications to viscous and inviscid flows, as well as simple flows of non-Newtonian fluids, and introductions to stability and turbulence. Graduate students must register for MECH 573, and will be expected to complete additional projects. Credit not given for both MECH 372 and MECH 473. Offered Spring. Instructor(s): Meade.

**MECH 481 HEAT TRANSFER (3)**

Study of the general principles of heat transfer by conduction, convection, and radiation. Includes their application to problems of engineering practice and thermal design. Required for mechanical engineering majors in B.S. program. Offered Spring. Instructor(s): Bayazitoglu.

**MECH 482 INTERMEDIATE HEAT TRANSFER (3)**

Continuation of MECH 481. Includes applications to various problems in mechanical engineering. Prerequisite(s): MECH 481. Instructor(s): Bayazitoglu.

**MECH 483 INTRODUCTION OF BIOMEDICAL INSTRUMENT AND MEASUREMENT TECHNIQUES (3)**

Review of basic sensors and measurement principles. Includes design problems using operational amplifier circuits (e.g., instrumentation and isolation amplifiers, comparators, timer circuits). Introduction to development of virtual instruments (VIs) using LabView. Discussion of micro- and macro-biopotential electrodes, cell cytometry, the measurement of blood pressure, blood flow, and heart sounds, temperature, and the principles of electrical safety (e.g., micro- and macro-shock hazards in the clinical environment). Includes discussion of pulmonary instrumentation and medical applications of ultrasound. Two lab exercises and a term project required. Cross-listed with BIOE 483, ELEC 483. Pre-requisite(s): ELEC 481 or permission of instructor. Instructor(s): Ghorbel; Clark.

**MECH 488 DESIGN OF MECHATRONIC SYSTEMS (3)**

Analog electronic design for purposes of controlling electromechanical systems, including electromechanical sensors and actuators, analog electronic design of filters, state space and classical controllers, and transistor-based servo amplifiers and high voltage amplifiers. Implementation of digital controllers. Significant laboratory component with design and fabrication of circuits to control electromechanical systems. Graduate/Undergraduate version: MECH 588. Pre-requisite(s): MECH 343 and ELEC 241. Recommended pre- or corequisite(s): MECH 420. Offered Spring. Instructor(s): O'Malley.

**MECH 498 INTRODUCTION TO ROBOTICS (3)**

Introduction to the kinematics, dynamics, and control of robot manipulators and to applications of artificial intelligence and computer vision in robotics. Cross-listed with COMP 498, ELEC 498. Graduate/Undergraduate version: MECH 598. URL: [www.owlnet.rice.edu/~mech498](http://www.owlnet.rice.edu/~mech498). Instructor(s): O'Malley.

**MECH 499 LEGAL THEMES ENG. & MANAGING (3)**

Introduction to fundamental legal concepts of the American legal system for upper level undergraduate students, primarily aimed at what engineers, scientists, and other professionals could expect to encounter in their professional careers. The primary focus is to provide students with the basic tools to understand and interact with lawyers. Cross-listed with MANA 499. Offered Fall. Instructor(s): Spanos; Warden

**MECH 500 ADVANCED MECHANICS OF MATERIALS (3)**

Offered concurrently with MECH 400. Graduate/undergraduate version MECH 400. Additional work required. Cross-listed with CEVE 500. Instructor(s): Akin.

**MECH 501 DYNAMICS AND CONTROL OF MECHANICAL SYSTEMS (3)**

Graduate version of MECH 411. Offered continually with MECH 411. Graduate/Undergraduate version: MECH 411. Pre-requisite(s): MECH 343 and MECH 420. Recommended prerequisite(s): MECH 343 and MECH 420 or equivalent. Offered Fall. Instructor(s): Ghorbel.

**MECH 502 VIBRATIONS (3)**

Term project is required. Offered concurrently with MECH 412. Graduate/Undergraduate version: MECH 412. Offered Spring. Instructor(s): Spanos.

**MECH 503 COMPUTER-AIDED DESIGN (3)**

Investigation of the integration of the computer into the area of design. Includes such subjects as optimization, finite element analysis, and commercial software. Graduate/Undergraduate version: MECH 403. Pre-requisite(s): CAAM 210. Offered Fall. Instructor(s): Akin.

**MECH 508 NONLINEAR SYSTEMS: ANALYSIS AND CONTROL (3)**

Mathematical background and fundamental properties of nonlinear systems: Vector norms, matrix norms, matrix measures, existence and uniqueness of solutions of ordinary differential equations. Linearization, second order systems, periodic solutions, approximate methods. Lyapunov stability: Stability definitions, Lyapunov's direct method, invariance theory, stability of linear systems, Lyapunov's linearization method, converse theorems. Selected topics in nonlinear systems analysis and nonlinear control from: Input/Output stability: Small gain theorem, passivity theorem. Perturbation theory, averaging, and singular perturbations Feedback linearization control. Other methods in the control of nonlinear systems such as back-stepping, sliding mode and other Lyapunov-based design methods. Advanced nonlinear and adaptive robot control. Cross-listed with CAAM 508, ELEC 508. Offered Fall. URL: [www.owl.net.rice.edu/~mech508](http://www.owl.net.rice.edu/~mech508). Instructor(s): Ghorbel.

**MECH 510 ELASTO DYNAMICS (3)**

Propagation of waves in linearly-elastic strings, fluids, and solids. Surface waves, wave reflection and refraction at interfaces. Wave propagation in waveguides. Steady-state and transient half-space problems. Scattering of waves by cracks. Offered Spring.

**MECH 511 CONTINUUM MECHANICS I (3)**

Exploration of concepts and general principles common to all branches of solid and fluid mechanics. Includes non-Newtonian fluid mechanics and nonlinear elasticity. Offered Spring. Instructor(s): Carroll.

**MECH 513 THEORY OF ELASTICITY (3)**

Advanced topics in the linear theory of elasticity. Cross-listed with CEVE 513. Offered Fall.

**MECH 514 NONLINEAR ELASTICITY (3)**

Development of the theory of finite elastic deformation and motion. Some exact solutions and methods of approximation. Offered Spring. Instructor(s): Carroll.

**MECH 516 THEORY OF PLASTICITY (3)**

Mathematical theory of plasticity. Thermodynamics of irreversible processes as applied to plasticity. Elasto-plastic boundary value problems. Slip-line theory. General principles. Single crystal plasticity. Dislocation dynamic-based plasticity. Pre-requisite(s): MECH 511 or MECH 513 or permission of instructor.

**MECH 517 FINITE ELEMENT METHODS (3)**

An introduction to Galerkin's method and the method of least squares applied to partial differential equations. Computational considerations for efficient interpolation, numerical integration, solution and post-processing methods. Error estimation and adaptive finite element analysis. Requires the use of ANSYS and Cosmoworks for a student project and a supporting literature survey. Graduate/Undergraduate version: MECH 417. Must be enrolled in one of the following level(s): Graduate. Offered Spring. URL: [www.owl.net.rice.edu/~mech517](http://www.owl.net.rice.edu/~mech517). Instructor(s): Akin.

**MECH 518 THEORETICAL FRACTURE MECHANICS (3)**

Topics on the theory of linear and nonlinear fracture mechanics. Energetics of fracture, the J-integral, stress and strain fields near crack tips, R-curve behavior. Cross-listed with MSCI 609.

**MECH 523 PROBABILISTIC STRUCTURAL DYNAMICS (3)**

Introduction to probability theory and random processes. Includes the dynamic analysis of linear and nonlinear structural systems subjected to stationary and non-stationary random excitations reliability studies related to first excursion and fatigue failures, and applications to earthquake engineering, offshore engineering, and wind engineering. Pre-requisite(s): MECH 412 or CEVE 521. Recommended prerequisite(s): MECH 412 or CEVE 521 and basic knowledge of probability theory. Offered Spring.

**MECH 524 ENGINEERING MATHEMATICAL AND NUMERICAL METHODS (3)**

Elements of linear algebra, linear operators, systems of linear differential equations for discrete physical systems, calculus of variations, partial differential equations, Green's functions, examples from solid and fluid mechanics, discretization of continuous systems, finite element method. Offered Fall.

**MECH 527 COMPUTATIONAL METHODS IN STRUCTURAL MECHANICS (3)**

Introduction to differential and integral formulations, variational principles, weighted residuals, and principle of virtual work. Simple boundary, initial, and eigenvalue problems. Finite element, boundary element, and finite difference methods for structural mechanics. Study of nonlinearities. Computational methods for geometric and material nonlinear analysis. Applications to static and dynamic problems. Programming and use of computer software. Cross-listed with CEVE 527. Offered Fall. Instructor(s): Nagarajaiah.



**MECH 534 MECHANICS AND SPORT (3)**

Graduate version of MECH 314. Additional work required. Graduate/Undergraduate version: MECH 314. Offered Spring. Instructor(s): Carroll.

**MECH 537 DESIGN AND CONTROL OF COMPUTER NETWORKS (3)**

Graduate-level introduction to fundamental concepts for the design and control of computer networks. Topics include resource allocation, routing, traffic modeling, congestion control, service disciplines, and multicasting. Concepts are applied to state-of-the-art systems and protocols such as current and future Internet architectures. Cross-listed with ELEC 537. Offered Fall. Instructor(s): Knightly.

**MECH 554 COMPUTATIONAL FLUID MECHANICS (3)**

Graduate version of MECH 454. Additional work required. Cross-listed with BIOE 554, CEVE 554. Graduate/Undergraduate version: MECH 454. Pre-requisite(s): MECH 371 and MECH 517 or permission of instructor. Offered Fall. URL: [www.mems.rice.edu/TAFSM/MECH454](http://www.mems.rice.edu/TAFSM/MECH454). Instructor(s): Tezduyar.

**MECH 563 ENGINEERING APPROACH TO MATH PROGRAMMING (3)**

Study of the minimization of functions of variables that are either unconstrained, subject to equality constraints, subject to inequality constraints, or subject to both equality and inequality constraints. Includes analytical and computational methods. Cross-listed with CAAM 563. Offered Fall. Instructor(s): Miele.

**MECH 564 ENGINEERING APPROACH TO OPTIMAL CONTROL (3)**

Study of optimal control theory and calculus of variations. Includes minimization of functionals depending on variables subject to differential constraints, non-differential constraints, initial constraints, and final constraints, includes analytical and computational methods. Offered Spring. Instructor(s): Miele.

**MECH 573 ADVANCED FLUID MECHANICS I (3)**

Examination of conservation equations for viscous compressible fluids. Includes applications to viscous and in viscid flows, as well as simple flows of non-Newtonian fluids. Limited enrollment. Offered Fall. Instructor(s): Meade.

**MECH 574 ADVANCED FLUID MECHANICS II (3)**

Continuation of MECH 573. Advanced topics in fluid mechanics. Possible topics include: vortex dynamics, aero acoustics, fluid stability theory, receptivity theory. Pre-requisite(s): MECH 573. Offered Spring.

**MECH 576 STRUCTURAL DYNAMIC SYSTEMS AND CONTROL (3)**

Elements of linear systems and control theory, transform methods, state space methods, feedback control, and Lyapunov's method. Analytical modeling of structures, and response to dynamic loading. Base isolation, smart materials and devices, sensors, structural control applications, monitoring, and case studies. Cross-listed with CEVE 576. Pre-requisite(s): CEVE 521 or MECH 502 and CEVE 527.

**MECH 582 CONVECTIVE HEAT TRANSFER (3)**

Rigorous study of the transfer of heat by free and forced convection. Not offered every year. Offered Fall. Instructor(s): Bayazitoglu.

**MECH 583 RADIATIVE HEAT TRANSFER I (3)**

This course will analyze the radiative heat transfer phenomena. After introduction, radiative exchange between surfaces in an enclosure without a radiatively participating medium will be analyzed. Then the radiative transfer equation through an absorbing, emitting and scattering medium (or participating medium) will be developed. The radiative properties of gases and particulates will be discussed. Instructor(s): Bayazitoglu.

**MECH 586 RESPIRATORY SYSTEM MECHANICS (3)**

Mechanics of ventilation, respiratory muscle mechanics, rib cage mechanics, mechanical coupling between the respiratory muscles and the rib cage, and inferences on mechanics from respiratory muscle anatomy. The class will meet in the Pulmonary Division at Baylor College of Medicine in the Texas Medical Center. Offered Fall. Instructor(s): Boriek.

**MECH 588 DESIGN OF MECHATRONIC SYSTEMS (3)**

Graduate/Undergraduate version: MECH 488. Pre-requisite(s): MECH 343 and MECH 420 and ELEC 241. Offered Spring. Instructor(s): O'Malley.

**MECH 591 GAS DYNAMICS (3)**

Study of the fundamentals of compressible, one-dimensional gas flows with area change, normal shocks, friction, and heat addition. Includes oblique shocks, Prandtl-Meyer flows expansions, and numerical techniques. Pre-requisite(s): MECH 371. Offered Spring. URL: [www.owl.net.rice.edu/~meh591](http://www.owl.net.rice.edu/~meh591). Instructor(s): Meade.

**MECH 593 MECHANICAL ENGINEERING PROBLEMS (3)**

An approved investigation or design project under the direction of a member of the staff. Open only to mechanical engineering majors. Must be enrolled in one of the following Major(s): Mechanical Engineering. Offered Fall & Spring.

**MECH 594 INTRODUCTION TO AERODYNAMICS (3)**

Development of theories for the prediction of aerodynamic forces and moments acting on airfoils, wings, and bodies. Includes their design applications. Not offered every year. Offered Fall. URL: [www.owl.net.rice.edu/mech594](http://www.owl.net.rice.edu/mech594). Instructor(s): Meade.

**MECH 595 MODELING TISSUE MECHANICS (3)**

Independent study and seminar course which focuses on modeling the mechanical properties of biological tissues. Data from experiments will be used to refine the predictions of nonlinear mathematical computer models. Aimed at juniors, seniors, and graduate students. Laboratory work performed at Baylor College of Medicine, computer work at Rice University. Offered Fall. Instructor(s): Boriek.

**MECH 598 INTRODUCTION TO ROBOTICS (3)**

Graduate/Undergraduate version: MECH 498.

**MECH 599 CURRENT TOPICS IN MECHANICAL ENGINEERING (3)**

Designed for graduate mechanical engineering students. Lectures in areas of current interest in mechanical engineering. Topics may vary from term to term. Please consult with the department for additional information. Offered Spring.

**MECH 601 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MECH 602 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MECH 603 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MECH 604 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MECH 605 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MECH 606 GRADUATE SEMINAR (1)**

Repeatable for Credit. Offered Fall & Spring.

**MECH 611 INDEPENDENT STUDY (1 TO 9)**

Repeatable for Credit. Offered Fall.

**MECH 612 INDEPENDENT STUDY (1 TO 9)**

Repeatable for Credit. Offered Spring.

**MECH 621 M.M.E. RESEARCH PROJECT I (3)**

This is the first part of the M.M.E. research project course. The faculty advisor, taking into account the background and research interests of the student as well as the research interests of the faculty advisor, will determine the contents. Course requirements will include a final report. Offered Fall & Spring.

**MECH 622 M.M.E. RESEARCH PROJECT II (3)**

This is the second part of the M.M.E. research project and continuation of MECH 621. Course requirements will include a final report. Offered Fall & Spring.

**MECH 654 ADVANCED COMPUTATIONAL MECHANICS (3)**

Advanced topics in computational mechanics with emphasis on finite element methods and fluid mechanics. Stabilized formulations. Fluid-particle and fluid-structure interactions and free-surface and two-fluid flows. Interface-tracking and interface-capturing techniques, space-time formulations, and mesh update methods. Enhanced discretization and solution techniques. Iterative solution methods, matrix-free computations, and advanced preconditioning techniques. Cross-listed with BIOE 654, CEVE 654. Prerequisite(s): MECH 554 or permission of instructor. Offered Spring. Instructor(s): Tezduyar.

**MECH 678 ADVANCED STOCHASTIC MECHANICS (3)**

Nonlinear random vibrations, Statistical Linearization, ARMA filters modeling, Monte Carlo Simulation, Wiener-Volterra series, time-variant structural reliability, and Stochastic Finite Elements are presented from a perspective of usefulness to aerospace, civil, marine, and mechanical applications. Cross-listed with CEVE 678. Offered Fall. Instructor(s): Spanos.

**MECH 679 APPLIED MONTE CARLO ANALYSIS (3)**

Probability density and power spectrum based simulation concepts and procedures are discussed. Scalar and vectorial simulation are addressed. Spectral decomposition and digital filter algorithms are presented. Applications from aerospace, earthquake, marine, and wind engineering, and from other applied science disciplines are included. Cross-listed with CEVE 679. Offered Fall. Instructor(s): Spanos.

**MECH 684 RADIATIVE HEAT TRANSFER II (3)**

Study of radiative transfer in the presence of absorbing, emitting, and scattering media. Includes combined radiation, conduction, and convection, as well as heat transfer in furnaces, fire propagation, and air pollution problems. Not offered every year. Offered Fall. Instructor(s): Bayazitoglu.

**MECH 695 ADVANCED MODELING TISSUE MECHANICS (3)**

Continuation of MECH 595/BIOE 595 with emphasis on advanced modeling the micromechanics of biological tissues. Independent study and seminar/discussion course. Data from experiments will be used to refine the predictions of mathematical models. Designed for juniors, seniors, and graduate students. Laboratory work performed at Baylor College of Medicine and computer work at Rice University. Offered Spring. Instructor(s): Boriek.

**MECH 800 RESEARCH AND THESIS (1 TO 12)**

Repeatable for Credit. Offered Fall & Spring.

**MGMP (MANAGEMENT FOR PROFESSIONALS)****Jones School of Management/Management****MGMP 500 MBA-P IMMERSION (1.5)**

Must be enrolled in one of the following Program(s): MBA, MBA for Professionals.

**MGMP 501 FINANCIAL ACCOUNTING (3)**

Introduction to the preparation, analysis, and use of corporate financial reports. Covers the basic techniques of financial reporting analysis from the perspective of managers as well as external users of information such as investors. Required for MBA. Repeatable for Credit. Offered Fall. Instructor(s): Price.

**MGMP 502 MANAGERIAL ACCOUNTING (1.5)**

Introduction to the use of financial and cost information by managers in budgeting, resource allocation, pricing, quality control, and other contexts to help managers set goals and monitor and evaluate performance. Required for MBA. Offered Spring.

**MGMP 510 ORGANIZATIONAL BEHAVIOR (1.5)**

Study of the many factors, which influence how individuals, groups, and teams behave and function in complex organizations and how they can be effectively managed. Offered Fall. Instructor(s): Smith; Zhou.

**MGMP 511 ORGANIZATIONAL CHANGE (.75)**

Emphasizes understanding what constitutes effective organizational designs, considers both the macro designing initiatives and the micro execution of those initiatives. Required for MBA. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit.

**MGMP 540 MANAGERIAL ECONOMICS (1.5)**

We study production and pricing decisions under different assumptions about firm market power. Emphasis is placed on understanding the relevant costs in firm decision-making. Examples are used from marketing and accounting areas. Required for MBA. Offered Fall. Instructor(s): Weston.

**MGMP 541 ECONOMIC ENVIRONMENT OF BUSINESS (1.5)**

Examination of the global economic environment that serves as a backdrop for business decision making, with emphasis on the key macroeconomic policy goals and tools and how they affect exchange rates, interest rates, business cycles, and long-term economic growth. Offered Fall. Instructor(s): Ostdiek.

**MGMP 543 FINANCE (3)**

Introduction to the theory and practice of corporate finance, with emphasis on topics such as valuation, capital budgeting, risk and return, and capital structure. Required for MBA. Offered Spring. Instructor(s): Lyandres.

**MGMP 560 ETHICS (.75)**

An exploration of the ethical and legal basis of managerial decision making and the social dimension of the business firm. Required for MBA. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Instructor(s): Windsor.

**MGMP 561 BUSINESS GOVERNMENT (1.5)**

Study of how public policy influences the private competitive environment of the firm. Examines the major political institutions and actors -- Congress, the President, interest groups, the media, and administrative agencies --that shape U.S. public policy. Students analyze business political strategies and formulated several of their own. Required for MBA. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals.

**MGMP 570 COMPETITIVE AND INDUSTRY ANALYSIS (1.5)**

Systematic examination of models and techniques used to analyze a competitive situation within an industry from a strategic perspective. Examines the roles of key players in competitive situations and the fundamentals of analytical and fact-oriented strategic reasoning. Examples of applied competitive and industry analysis are emphasized. Required for MBA. Offered Fall. Instructor(s): Li.

**MGMP 571 STRATEGIC FORMULA AND IMPLEMENTATION (1.5)**

This course focuses on formulating and implementing effective organizational strategy, including competitive positioning, core competencies and competitive advantage, cooperative arrangements, and tools for implementation. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Instructor(s): Wiersema.

**MGMP 574 OPERATIONS MANAGEMENT (1.5)**

Introduction to the principles of production management and process improvement. Required for MBA. Offered Spring.

**MGMP 580 MARKETING (3)**

Introduction to the key concepts underlying the function of marketing and its interaction with other functions in a business enterprise. Explores marketing's role in defining, creating, and communicating value to customers. Primarily case-based with capstone simulation exercise, providing a foundation for advanced course work in marketing. Required for MBA. Offered Spring. Instructor(s): Dholakia.

**MGMP 595 DATA ANALYSIS (3)**

The ever-increasing capacity of computers to analyze data and the explosion of the amount of data available has resulted in an increase role for data analysis as an aid to business decision-making. This course exposes the student to most important ideas and methods relevant for data analysis in a business context. Emphasizing practical applications to real problems, the course covers the following topics: sampling, descriptive statistics, probability distributions, and regression analysis. Required for MBA. Offered Fall. Instructor(s): Batsell.

**MGMP 596 LEADERSHIP COMMUNICATION (1.5)**

Introduction to the strategy and practice of management communication. Assignments are based on core courses integrated across the curriculum. Includes individual communication skills assessment and development and team-based oral and written communication instruction. Required for MBA. Offered Fall. Instructor(s): Wiley; Peters.

**MGMP 597 ILE (1.5)**

Repeatable for Credit.

**MGMP 598 ICE FIRST YEAR (1.5)**

ALP I focuses completely on the group project, including interacting with the faculty and corporate liaison to refine the scope and proposal, developing data gathering methods (surveys, interviews, research, etc.), completing research, beginning analysis, conducting progress reviews, and adjusting the project as necessary to ensure satisfactory completion of the project in ALP II. Repeatable for Credit. Offered Spring.

**MGMP 601 FINANCIAL STATEMENT ANALYSIS (1.5)**

Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Instructor(s): Crawford.

**MGMP 684 BRAND MANAGEMENT (1.5)**

Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Instructor(s): Perkins.

**MGMP 693 NEW PRODUCTS I (1.5)**

Exploration of the critical role of new products within the corporation and in small businesses, focusing on consumer products. Discusses the critical steps in new product development from ideal generation to business analysis and cross-functional team management to product launch into the marketplace. Students will work in groups to develop their own new products and to prepare the key elements for a new product introduction. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Instructor(s): Singh.

**MGMP 694 NEW PRODUCTS II (1.5)**

Continuation of New Products I. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMP 693. Repeatable for Credit. Instructor(s): Singh.

**MGMP 701 COMMUNICATION I ILE (1)**

Repeatable for Credit.

**MGMP 703 ETHICS ILE (1.5)**

Repeatable for Credit.

**MGMP 704 COMMUNICATION II ILE (1)**

Repeatable for Credit.

**MGMP 706 LEADERSHIP ILE (1.5)**

This course explores perspectives on leadership and management. Considers how leadership and management complement each other and what constitutes effective leadership in business situations. Required for MBA. Repeatable for Credit.

**MGMP 798 FIRST YEAR CAPSTONE (3)**

This core course uses a capstone business strategy simulation conducted in close proximity to the required formulation/implementation course. Student teams operate simulated companies in a highly competitive industry. Emphasis is placed on integrating strategy, financial control, operational excellence, and team building. Teams make presentations at the end of the course. Instructor(s): Windsor.

**MGMT (MANAGEMENT)****Jones School of Management/Management****MGMT 500 PRE-MATRICULATION REQUIREMENT (1.5)****MGMT 501 FINANCIAL ACCOUNTING (3)**

Introduction to the preparation, analysis, and use of corporate financial reports. Covers the basic techniques of financial reporting and analysis from the perspective of managers as well as external users of information such as investors. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Rountree.

**MGMT 502 COST MANAGEMENT (1.5)**

Introduction to the use of financial and cost information by managers in budgeting, resource allocation, pricing, quality control, and other contexts to help managers set goals and monitor and evaluate performance. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Prerequisite(s): MGMT 501. Repeatable for Credit. Offered Spring. Instructor(s): Anderson.

**MGMT 503 MANAGEMENT CONTROL (1.5)**

This course builds on earlier courses on cost management and corporate strategy and focuses on the management control systems that can be used for the effective implementation of strategy. Included topics are the balanced scorecard, stretch budgets, performance evaluation and incentives, organizational and operational controls, and the development of metrics to motivate and evaluate performance. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Prerequisite(s): MGMT 502. Repeatable for Credit. Offered Spring. Instructor(s): Epstein.

**MGMT 506 LEADERSHIP (1)**

Explores different perspectives on leadership and management. Considers how leadership and management complement each other and what constitutes effective leadership in business situations. Repeatable for Credit. Offered Fall. Instructor(s): Kehoe.

**MGMT 507 LEADERSHIP (0 TO 1)**

Explores different perspectives on leadership and management. Considers how leadership and management complement each other and what constitutes effective leadership in business situations. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Kehoe.

**MGMT 508 LEADERSHIP ILE (0)**

Explores different perspectives on leadership and management. Considers how leadership and management complement each other and what constitutes effective leadership in business situations. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Smith.

**MGMT 509 NEGOTIATION (0)**

Development of analytical and behavioral skills for effective negotiation, including topics such as diagnosing conflict, decision making, adversarial versus cooperative strategies, ethical and cultural factors, and third-party intervention. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Zhou.

**MGMT 510 ORGANIZATIONAL BEHAVIOR (1.5)**

Study of the many factors, which influence how individuals, groups, and teams behave and function in complex organizations and how they can be effectively managed. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Smith.

**MGMT 511 ORGANIZATIONAL THEORY AND CHANGE MANAGEMENT (1)**

Emphasizes understanding what constitutes effective organizational designs; considers both the macro designing of change initiatives and the micro execution of those initiatives. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Kehoe.

**MGMT 512 ORGANIZATIONAL THEORY AND CHANGE MANAGEMENT (.75)**

Offered Spring.

**MGMT 530 INFORMATION TECHNOLOGY (1)**

Overview of information technology and its applications in organizations, with emphasis on effectively managing the use of information technology. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Timmreck.

**MGMT 540 MANAGERIAL ECONOMICS (1.5)**

We study production and pricing decisions under different assumptions about firm market power. Emphasis is placed on understanding the relevant costs in firm decision-making. Examples are used from marketing and accounting areas. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Paye.

**MGMT 541 ECONOMIC ENVIRONMENT OF BUSINESS (1.5)**

Examination of the global economic environment that serves as a backdrop for business decision making, with emphasis on the key macroeconomic policy goals and tools and how they affect exchange rates, interest rates, business cycles, and long-term economic growth. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 540. Repeatable for Credit. Offered Spring. Instructor(s): Ostdiek.

**MGMT 543 FINANCE (3)**

Introduction to the theory and practice of corporate finance, with emphasis on topics such as valuation, capital budgeting, risk and return, and capital structure. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Corequisite(s): MGMT 501. Repeatable for Credit. Offered Fall. Instructor(s): Westen.

**MGMT 560 BUSINESS ETHICS (1)**

An exploration of the ethical and legal bases of managerial decision making and the social dimension of the business firm. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Cording; Windsor.

**MGMT 561 BUSINESS-GOVERNMENT RELATIONS (1.5)**

Study of how public policy influences the private competitive environment of the firm. Examines the major political institutions and actors—Congress, the President, interest groups, the media, and administrative agencies—that shape U.S. public policy. Students analyze business political strategies and formulate several of their own. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Schuler.

**MGMT 565 GLOBALIZATION OF BUSINESS (1)**

Examination of the increasing importance of trade and globalization to U.S. business. Course first focuses on the industrial winners and losers of free trade and protectionism, and then examines the institutions governing trade between the U.S. and its industrial competitors. Finally, the course examines the main challenges for foreign investment in important markets, such as Japan and China. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Zhang.

**MGMT 570 COMPETITIVE AND INDUSTRY ANALYSIS (.75)**

Systematic examination of models and techniques used to analyze a competitive situation within an industry from a strategic perspective. Examines the roles of key players in competitive situations and the fundamentals of analytical and fact-oriented strategic reasoning. Examples of applied competitive and industry analysis are emphasized. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Li.

**MGMT 571 STRATEGY FORMULATION AND IMPLEMENTATION (1.5)**

This course focuses on formulating and implementing effective organizational strategy, including competitive positioning, core competencies and competitive advantage, cooperative arrangements, and tools for implementation. Offered Spring.

**MGMT 574 OPERATIONS MANAGEMENT (1.5)**

Introduction to the principles of production management and process improvement. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring.

**MGMT 580 MARKETING (3)**

Introduction to the key concepts underlying the function of marketing and its interaction with other functions in a business enterprise. Explores marketing's role in defining, creating, and communicating value to customers. Primarily case-based with capstone simulation exercise, providing a foundation for advanced course work in marketing. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Seetharaman.

**MGMT 594 COMMUNICATIONS II (.75)**

Introduction to the strategy and practice of management communication. Assignments are based on core courses integrated across the curriculum. Includes individual communication skills assessment and development and team-based oral and written communication instruction. Required for M.B.A. Prerequisite(s): MGMT 596. Repeatable for Credit. Offered Spring. Instructor(s): Peters; Wiley.

**MGMT 595 DATA ANALYSIS I (.75)**

The ever-increasing capacity of computers to analyze data and the explosion of the amount of data available has resulted in an increased role for data analysis as an aid to business decision-making. This course exposes the student to the most important ideas and methods relevant for data analysis in a business context. Emphasizing practical applications to real problems, the course covers the following topics: sampling, descriptive statistics, probability distributions, and regression analysis. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Borle.

**MGMT 596 LEADERSHIP COMMUNICATION (.75)**

Introduction to the strategy and practice of management communication. Assignments are based on core courses integrated across the curriculum. Includes individual communication skills assessment and development and team-based oral and written communication instruction. Required for M.B.A. Must be enrolled in one of the following Program(s): MBA. Department permission required. Repeatable for Credit. Offered Fall. Instructor(s): Peters; Wiley.

**MGMT 597 DATA ANALYSIS II (1.5)**

The ever-increasing capacity of computers to analyze data and the explosion of the amount of data available has resulted in an increased role for data analysis as an aid to business decision-making. This course exposes the student to the most important ideas and methods relevant for data analysis in a business context. Emphasizing practical applications to real problems, the course covering the following topics: sampling, descriptive statistics, probability distributions, and regression analysis. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 595. Offered Spring. Instructor(s): Borle.

**MGMT 598 ACTION LEARNING PROJECT I (0)**

ALP I focuses completely on the group project, including interacting with the faculty and corporate liaison to refine the scope and proposal, developing data gathering methods (surveys, interviews, research, etc.), completing research, beginning analysis, conducting progress reviews, and adjusting the project as necessary to ensure satisfactory completion of the project in ALP II. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Kehoe.

**MGMT 599 ACTION LEARNING PROJECT II (5.5)**

Group project in which students, under the guidance of faculty and a corporate liaison, study the scope of improvements needed, examine a company's processes, and then provide written recommendations and present findings to senior management. Required for MBA. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 598. Offered Spring. Instructor(s): Kehoe.

**MGMT 601 FINANCIAL STATEMENT ANALYSIS (3)**

Study of how investors, financial analysts, creditors, and managers use financial statement information in evaluating firm performance and in valuing firms. Emphasizes industry and firm-level analysis of accounting information using financial accounting concepts and finance theory. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Spring. Instructor(s): Dharan.

**MGMT 602 STRATEGIC COST MANAGEMENT (3)**

Using the value chain as the organizing framework, this class explores how firms design business processes and management information systems to achieve strategic advantage through a competitive cost structure. Competitive cost structures are increasingly obtained, not through technical efficiencies of a single firm, but through innovative collaboration among firms--what has been termed the extended enterprise. Thus, more than half of the course considers strategic cost management at the boundaries of the firm--where the firm interacts with suppliers, strategic alliance partners, customers and society. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Anderson.

**MGMT 603 FEDERAL TAXATION (3)**

Survey of the basic federal tax law concepts of business income and deductions, proceeding to tax aspects of different forms of business organizations, emphasizing corporations. Includes sections of tax planning for mergers and acquisitions, compensation planning, and international tax effects. Introduces tax research. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Prerequisite(s): MGMT 501 or MGMP 501. Repeatable for Credit. Offered Fall. Instructor(s): Viebig.

**MGMT 606 CORPORATE FINANCIAL REPORTING: INTERNATIONAL PERSPECTIVES (1.5)**

Course covers aspects of interest to corporate finance officers and financial statement readers on a number of critical financial reporting issues, including those related to merchandise inventories, fixed and intangible assets, liabilities, shareholders' equity, business combinations, consolidated financial statements and segment reporting, and the effects of changing prices on net income and rate of return. The strategic role of the newly restructured International Accounting Standards Board, especially as viewed by the Securities and Exchange Commission and the European Commission, will be explored. Students will be apprised of the sweeping and fundamental changes that are occurring today in the milieu of international financial reporting. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Zeff.

**MGMT 607 FINANCIAL REPORTING AND ANALYSIS (1.5)**

This course is intended to enhance your ability to relate economic events to financial statement disclosures and to aid in developing a coordinated set of concepts and principles to serve as a framework for analyzing a variety of financial reporting issues. The goal is to make you an informed issuer or user of financial statement information. We will focus on understanding the mapping between underlying economic events and the information in financial statements, and on how this mapping affects inferences about the firm's financial position and future profitability. To provide context for understanding the implications of firms' accounting and reporting decisions, we will rely on case analyses. Topics to be covered include accounts receivable and inventory valuation, intangible assets, intercorporate investments, including consolidations and goodwill accounting, post-employment benefits, stockholders' equity, and employee stock options. Must be enrolled in one of the following Program(s): MBA. Prerequisite(s): MGMT 501. Repeatable for Credit. Offered Spring. Instructor(s): Price.

**MGMT 608 ACCOUNTING ANALYSIS OF COMPLEX BUSINESS TRANSACTION (3)**

This course is designed for students who will embark on careers requiring a sophisticated understanding of advanced financial accounting and reporting concepts. The focus is on the use rather than the preparation of financial statements, although it will be necessary to understand the underlying accounting mechanics. The main objective of the course is to understand the economic events underlying complex business transactions. This requires an understanding of the underlying accounting, including how to interpret financial statement footnotes and related disclosures as well as the financial statements themselves, and how to use this information in ways that are relevant for applications such as credit analysis, equity valuation, and transaction structuring. Topics covered include intercorporate investments, business combinations and goodwill accounting, intangible assets, stockholders' equity and employee stock options, deferred taxes, pensions and other post-employment benefits, leases, securizations, and derivatives and hedge accounting. Repeatable for Credit. Offered Fall. Instructor(s): Nelson.

**MGMT 610 FUNDAMENTALS OF THE ENERGY INDUSTRY (3)**

Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit.

**MGMT 613 MANAGING FOR CREATIVITY AND INNOVATION (1.5)**

Study of the nature of creativity, creative thinking skills and ways to encourage, promote, and effectively manage creativity and innovation in complex organizations. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Zhou.

**MGMT 614 ADVANCE SEMINAR IN STRATEGY MAKING FOR MANAGERS (3)**

This course builds upon the coverage of strategic management in core courses to provide participants with advanced skills for developing creative organizational strategies. It anticipates future strategy-making contexts facing organizations and examines a variety of useful ways to develop effective "emergent", "adaptive", "growing", and/or "analytic" strategies under these conditions. In this seminar, teams of participants are actively involved in building state-of-the-art strategy-making skills for successful management careers. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Taylor.

**MGMT 615 STRATEGIC PROBLEM SOLVING (3)**

Strategic Problem Solving examines theories, concepts and techniques used by highly effective managers and executives to solve challenging strategic problems facing their organizations. Strategic problems of two major types are addressed—problems as threats and problems as opportunities. The course integrates relevant ideas from decision sciences and strategic decision making and presents a coherent framework managers can use to become more effective strategic problem solvers. Focus is on analyzing and learning how to solve strategic problems course participants have faced or are likely to deal with in their future careers. Requires second year Jones School standing or permission of the instructor. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Taylor.

**MGMT 616 SEMINAR IN ORGANIZATIONAL PSYCHOLOGY (3)**

The objective of this course is to orient students to current topics in organizational psychology and provide an advanced treatment of core concepts in organizational behavior. Topics will include organizational climate and culture, misbehavior in organizations, leadership, job satisfaction and job attitudes, and organizational justice. Topics will also cover a special section on recent advances in conducting organizational research, including multi-level modeling of organizational survey data. Course is also open to students pursuing a graduate degree in psychology. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Smith.

**MGMT 617 MANAGERIAL DECISION MAKING (3)**

Examination of current advances in managerial decision-making theories, processes and practices. Advances featured in the 2003 course include: problem finding and solving; enhancing decision-making creativity; avoiding cognitive decision traps; using the major decision-making approaches (decision analysis, logical incrementalism, and intuition); understanding team, inclusive, participative, and distributed decision making; and implementing decisions effectively. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Taylor.

**MGMT 618 COMPLEXITIES OF PEOPLE AND ORGANIZATIONS (1.5)**

A seminar focused on contemporary issues on organizational behavior. Potential topics include the changing nature of work and organizations, the meaning of work in people's lives, the intersection of work and family, and functions and dysfunctions of alternative ways of organizing, managing, and leading people in complex organizations. Instructor(s): George.

**MGMT 619 CORPORATE GOVERNANCE (1.5)**

Critical examination of director selection, board decision-making processes, chief executive officer evaluation and compensation, the board's role in strategic planning, the impact of external constituencies of governance, and legal aspects of governance. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Zhou.



**MGMT 620 THE NEW ENTERPRISE (2)**

Evaluating opportunities and developing a business concept; analyzing new ventures; pricing, selling, and cost control; attracting stakeholders and bootstrap finance; the legal form of business and taxation; financing, deal structure and venture capital; harvesting value. Emphasis on case method. (NOTE: MGMT 620 and MGMT 621 provide much of the same content and may not both be taken for credit.) Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Napier.

**MGMT 621 THE NEW ENTERPRISE AND BUSINESS PLAN DEVELOPMENT (3)**

Evaluating opportunities and developing a business concept; analyzing new ventures; pricing, selling, and cost control; attracting stakeholders and bootstrap finance; the legal form of business and taxation; financing, deal structure and venture capital; harvesting value; developing a business plan. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Napier.

**MGMT 622 REAL TIME ENTERPRISE (2)**

Investigates the significance of this phenomenon with respect to key elements of traditional enterprises. The effect on business strategy is discussed, with a view toward competing in this new environment. Several types of contribution to value creation will be identified. Importantly, the value limits of the Real Time Enterprise (RTE) will also be identified, i.e., the point at which the cost of being real time exceeds the value. The new infrastructures and architectures needed to support Real Time Enterprises will also be explored. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Timmreck; Papadopoulos.

**MGMT 623 ENTREPRENEURSHIP IN BIOTECHNOLOGY (1.5)**

Provides an insider's perspective on workings and challenges of an early to mid-stage pharmaceutical company. Current company issues and case studies are used to discuss topics including pre-clinical & clinical development, licensing & business development and intellectual property and patent strategies. Intended for students considering a career in an entrepreneurial biotechnology company. Previous coursework in entrepreneurship or healthcare is preferred. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Varadnashy.

**MGMT 624 REAL ESTATE (3)**

This course emphasizes the components and processes of real estate industry including identification and analysis of investment and development opportunities from an entrepreneurial standpoint. It utilizes Harvard Cases and requires a major field project. Guest lectures will constitute a portion of most sessions. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Finger.

**MGMT 625 CREATIVE ENTREPRENEURSHIP (1.5)**

Designed for those wishing to form their own business. It takes the prospective entrepreneur from the conception stage through the opening of the doors on the first day of business. Students will form teams to make final presentations of their business plans. The winning team of the final presentation will be eligible to participate in the Southwest Business Plan Competition at Rice University. Numerous invited speakers. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Corequisite(s): MGMT 621. Repeatable for Credit. Offered Fall. Instructor(s): Murphree.

**MGMT 626 VENTURE CAPITAL (1.5)**

Overview of the venture capital industry; the organization and operation of venture capital funds; investment methodology; monitoring and portfolio liquidation; leveraged investing; and specialized investments. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Mueller.

**MGMT 627 ENTERPRISE EXCHANGE (3)**

The needs approach to buying and selling businesses; enterprise valuation; deal and contract structuring; mergers and acquisitions; leveraged buyouts; consolidating fragmented industries. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 601 and (MGMT 620 or MGMT 621). Repeatable for Credit. Not offered this academic year. Instructor(s): Williams.

**MGMT 628 OPPORTUNITY, IDENTIFICATION, AND ANALYSIS (2)**

Opportunity Identification and Analysis teaches students to recognize attractive opportunities. The most attractive opportunities can generate large cash flows with a minimum of investment; the least attractive ideas have little chance for significant profits but soak up large amounts of time and money. Students will learn to apply skills learned in Finance, Accounting, Marketing and Strategy to a series of real world case dilemmas. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 629 BUSINESS PLAN DEVELOPMENT (1.5)**

Offered Spring.

**MGMT 630 SYSTEMS ANALYSIS AND DESIGN (1)**

History and evolution of software systems analysis and design; the major approaches to systems development, including structured analysis, data-driven analysis, and object-oriented analysis and design techniques; and examination of traditional life-cycle methodologies and newer interactive approaches to systems development. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 632 E-BUSINESS (2)**

An overview of electronic commerce, including an examination of methods used to create and manage a business on the Internet. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 633 LIFE SCIENCE ENTREPRENEURSHIP & ROLES OF FOUNDERS & VENTURE CAPITAL IN HIGH-TECH STARTUPS (1.5)**

The origins of re-engineering, current methods for reorganizing a corporation around business processes, reengineering's relationship to systems development, and the relevance of developing modern information systems around business processes. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year.

**MGMT 634 INTELLECTUAL CAPITAL (1)**

Exploration of intellectual capital knowledge, information, intellectual property, experience--that can be put to use to create wealth. This course focuses on intellectual capital asset mapping (human, structural, customer capital), knowledge work, role of collaborative information technologies, and creating networked organizations. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 635 EMERGING TECHNOLOGIES (2)**

Leaders of 21st century companies are digital business architects requiring insight into the emerging technology landscape in order to exploit potential disruptions rather than being made irrelevant by them. The goal is not to predict the future, but to make better decisions in the present. What will be the important technologies in two to three years? What will be the impacts of these new technologies on work? Organizations? New value propositions? In this course, we will scan new technologies by looking at innovations in development as well as discuss cases of the recent past to learn from companies that were both successful and not so successful in exploiting them. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 637 STRATEGIC USE OF INFORMATION TECHNOLOGY (1.5)**

Examination of the strategic use of information technology to provide a competitive advantage. Exploration of business models, case studies, IT trends, and hot topics. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Baker.

**MGMT 638 SOCIETY IN THE INFORMATION AGE (1.5)**

Our increasing use of information technology is profoundly affecting the ways in which we live, work and think about the world around us. For example, the pervasive use of computers and networks is changing our ideas about property, privacy, security, authority, social relations, knowledge and identify. Such changes have many consequences for business, and in this course, we will explore some of the most important of these. Must be enrolled in one of the following Program(s): MBA. Instructor(s): Gorry.

**MGMT 640 WRIGHT FUND PRIMER (1)**

This short course is an intensive review of the equity markets and portfolio management techniques intended to quickly bring MGMT 643 students up to speed to manage a live portfolio (the M.A. Wright Fund). Must be enrolled in one of the following Program(s): MBA. Corequisite(s): MGMT 643. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Foote.

**MGMT 641 WRIGHT FUND PRIMER (1)**

This continues the study of financial theory and research concerning asset pricing and portfolio management that was initially started in MGMT 640. The course focuses on classic issues in investment finance as well as new and exciting issues at the cutting edge of finance. The course is conducted in an interactive, seminar-like format and is open to all second year students who satisfy the prerequisites regardless of whether they have or have not taken MGMT 648. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 648. Corequisite(s): MGMT 643. Not offered this academic year. Instructor(s): Foote.

**MGMT 642 FUTURES AND OPTIONS I (1.5)**

An introduction to forward, futures, option, and swap contracts, including the basic valuation principles, the use of these contracts for hedging financial risk, and an analysis of option-like investment decisions. Recommended for finance students. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 543 or MGMP 543. Repeatable for Credit. Offered Fall. Instructor(s): Fleming.

**MGMT 643 PORTFOLIO MANAGEMENT I - WRIGHT FUND (3)**

Students will gain hands on exposure to many aspects of investment management by managing 'live' portfolio (the M.A. Wright Fund) of endowed assets. The first semester's work (students must continue to MGMT 644) is predominately focused on stock analysis and valuation. Admission is by application and interview only. Must be enrolled in one of the following Program(s): MBA Executive Program, MBA. Prerequisite(s): MGMT 543. Corequisite(s): MGMT 640, MGMT 648. Limited enrollment. Offered Fall & Spring. Instructor(s): Foote.

**MGMT 644 PORTFOLIO MANAGEMENT II - WRIGHT FUND (3)**

This course is a continuation of MGMT 643 with a focus on investment portfolio management including responsibility for sector analysis and strategy, and risk / return evaluation. Four students (elected in MGMT 643) will serve as the Wright Fund's officers. Must be enrolled in one of the following Program(s): MBA Executive Program, MBA. Pre-requisite(s): MGMT 640 and MGMT 643 and MGMT 648. Recommended corequisite(s): MGMT 645. Limited enrollment. Offered Fall & Spring. Instructor(s): Foote.

**MGMT 645 INVESTMENTS (3)**

Review of classic investment theory, with emphasis on measuring and managing investment risk and return. Includes the development of modern portfolio theory and asset pricing models, an introduction to option and futures contracts, market efficiency, and stock valuation. Recommended for most finance students. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Prerequisite(s): MGMT 543 or MGMP 543. Repeatable for Credit. Offered Fall.

**MGMT 646 CORPORATE INVESTMENT POLICY (1.5)**

**CORPORATE FINANCIAL REPORTING \*\*\*\*\*** Exploration of value creation, diversification, risk-benefit analysis, tax policy, and present value, with emphasis on practical problems of the corporation. Limited enrollment. \*\*\*\*\* Course not offered 2004-2005. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit.

**MGMT 647 CORPORATE FINANCIAL POLICY (3)**

Examination of corporate investment and financing, with emphasis on valuation methods and how financial policy impacts corporate value. Includes the implications of agency costs, asymmetric information and signaling, taxes, mergers and acquisitions, corporate restructuring, real and embedded options, and financial risk management. Recommended for finance students. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 543 or MGMP 543 or MGMP 543. Repeatable for Credit. Offered Fall. Instructor(s): Lyandres.

**MGMT 648 APPLIED FINANCE (1.5)**

Study of the theory and practice of the fundamental principles in finance emphasizing hands-on experience with a wide range of corporate finance and investments applications. The course provides extensive opportunity to implement finance theory at a practical level and to develop advanced analytical spreadsheet expertise. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 543 or MGMP 543. Repeatable for Credit. Offered Spring.

**MGMT 649 INTEREST RATE/CREDIT RISK MANAGEMENT (1.5)**

This class explores the use of bonds and fixed income derivatives to manage interest and credit risks. The focus will be on applications using these securities, rather than their valuation, although we will develop and use models to correctly price instruments such as interest rate and asset swaps, caps, and structured notes. In addition, we will discuss models of credit risk and applications of the methods developed in class for evaluating the risk in complex structured swaps and risky sovereign debt. Throughout, the emphasis in the class will be on practical applications of the analytical concepts to real data and securities. Must be enrolled in one of the following Program(s): MBA.

**MGMT 650 FUTURES AND OPTIONS II (3)**

In-depth analysis of the theory and practice of derivative securities. Develops a general set of valuation, hedging, and risk management techniques, which are then applied to the equity, interest rate, currency, and commodity markets. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 543 and MGMT 642. Repeatable for Credit. Instructor(s): Fleming.

**MGMT 651 FIXED INCOME MANAGEMENT (1.5)**

Study of fixed income securities and markets in the U.S. and abroad, with an emphasis on the term structure of interest rates and the pricing of fixed income securities, derivatives, and portfolios. Include Treasury, Corporate Debt, and Mortgage-Backed Securities. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 543. Repeatable for Credit. Offered Spring. Instructor(s): Xing.

**MGMT 652 MERGERS AND ACQUISITIONS (1.5)**

The course examines the merger and acquisition process from the perspectives of buyers and sellers. Attention is paid to the internal (make) versus external (buy) growth opportunities and their value consequences. The course also analyzes the M&A transaction process through the study of cases. An additional focus will be in the interaction of strategic planning, value planning, financial strategies, and investment decisions. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 543 or MGMP 543. Repeatable for Credit. Not offered this academic year. Instructor(s): Lyandres.

**MGMT 653 PRIVATE EQUITY (1.5)**

Provides an overview of the private equity process. Private equity is a rapidly growing segment of the capital markets that funds mature and growing companies during the pre-public growth phase. Many companies are sold to strategic buyers as an alternative to going public. The private equity market also provides capital for LBOs and MBOs. We will examine three perspectives: (1) the organization and operation of private equity funds, (2) the due diligence investigation, negotiation of terms and valuation analysis necessary to make private equity investments and (3) exiting private equity investments. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 543. Repeatable for Credit. Not offered this academic year.

**MGMT 654 COMMERCIAL BANKING (1.5)**

Role of commercial banks in: Payments and clearing; new money creation, financing enterprise; reacting to monetary policy, credit criteria, services, economic and competitive environment, and global issues. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 543. Repeatable for Credit. Limited enrollment. Not offered this academic year.

**MGMT 656 ENERGY DERIVATIVES (3)**

Examines the physical energy markets, common financial instruments, and their applications, including cross-commodity hedges, dual variable assets, synthetic options, and swaps. Decision criteria for both outright and risk management trading are covered with respect to both fundamental and technical analysis. Eight guest speakers from various companies throughout the industry will participate. Must be enrolled in one of the following Program(s): MBA. Corequisite(s): MGMT 650. Repeatable for Credit. Offered Spring. Instructor(s): Kaminski.

**MGMT 657 INTERNATIONAL FINANCE (3)**

Exploration of special problems encountered by financial officers in international arenas. Includes the economics of the foreign exchange market, exchange rate risk management, international portfolio management, capital budgeting for international projects, and international financing strategies. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 543 and MGMP 642 or MGMP 543 and MGMP 642 or MGMP 5. Repeatable for Credit. Offered Fall. Instructor(s): Watanabe.

**MGMT 658 APPLIED RISK MANAGEMENT (1.5)**

This course focuses on applied risk management projects. The hands-on experience allows in-depth analysis and understanding of practical risk management issues and exposure to different risk management tools including Value at Risk and Monte Carlo simulations. The course emphasizes student development and application of skills rather than lectures. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 642 and MGMT 648. Repeatable for Credit. Offered Spring. Instructor(s): Cory.

**MGMT 659 REAL ESTATE FINANCE (3)**

This course provides an introduction to the concepts and techniques used to analyze and commercial real estate assets and the instruments commonly used to finance these assets. The topics covered include financial analysis of income-generating real property, analysis of mortgage instruments, commercial mortgage-backed securities (CMBS), and real estate investment trusts (REITs). This course is designed for students who are interested in commercial real estate; topics pertaining to single-family residential real estate will be covered only in passing. The course will offer all students an opportunity to develop their business presentation skills through case discussions and a final project presentation. The final project involves the detailed analysis of a CMBS deal, including separate, linked analyses of the mortgage collateral pool, the mortgages, and the note structure. The final project will require the use of all of the tools developed in the course. Must be enrolled in one of the following Program(s): MBA. Corequisite(s): MGMT 642. Repeatable for Credit. Offered Fall. Instructor(s): Downing.

**MGMT 660 PUBLIC NONPROFIT STRATEGIC AND FINANCIAL MANAGEMENT (1 TO 3)**

Introduction to the key elements of financial management in the public and nonprofit sectors: noncommercial accounting, appropriations process, budgeting procedures, social cost-benefit and cost-effectiveness analysis, financial supervision, and related topics. Suitable for students interested in government, health care, nonprofit management, or consulting practices in those areas. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Windsor.

**MGMT 661 INTERNATIONAL BUSINESS LAW (3)**

Exploration of U.S. and foreign law as it relates to the law-business interface of importing-exporting trade problems, foreign operations, and foreign investments. Includes the extraterritorial impact of U.S. law, corporate organization, foreign exchange, joint ventures, withdrawal from foreign ventures, and third-country manufacturing. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 561. Repeatable for Credit. Offered Spring. Instructor(s): Hannan.

**MGMT 662 TECHNOLOGY STRATEGY AND INNOVATION (3)**

This course provides a strategy framework for managing various aspects of innovation. The emphasis throughout this course is on the development and application of conceptual frameworks, which clarify how innovation affects the competitive dynamics of markets, how firms can strategically manage innovation, and how firms can implement innovation strategies to penetrate new markets, achieve higher margins, and increase their sustainable competitive advantage. The first half of the course examines industry dynamics and patterns of technological change and their impacts on firms, planning for technological transitions, and means for commercializing innovation. The second half of the course studies organizational issues involved in managing innovation such as understanding the strategic use of complementary assets and value assets and value networks, managing disruptive versus sustaining technologies, exploiting sources of new product ideas, and crafting a strategy for project selection. The course uses case analyses of companies and a combination of class discussion and lecture to examine these topics. Must be enrolled in one of the following Program(s): MBA. Offered Fall. Instructor(s): Weigelt.

**MGMT 663 ADVANCED CORPORATE FINANCE (1)**

This course provides students an in-depth study and analysis of advanced topics in corporate finance such as financial restructuring through mergers and acquisitions and spin-offs and financial engineering such as issues of complex securities. The course requires a solid understanding of the theory and practice of corporate finance. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 665 ORGANIZATIONAL DESIGN AND STRATEGY (1.5)**

This course provides analytical frameworks for managing the internal working of firms and how they affect a firm's ability to create and maintain competitive advantage. The course provides a set of analytic frameworks drawn from strategy, economics, and organization theory for thinking about how strategic choices are made in organizations and their impact on competitive advantage. Topics include resource allocation and strategy implementation, emergent versus deliberate strategy making, make-or-buy decisions, franchising, core capabilities and core rigidities, allocation of decision rights in firms, incentive systems, and optimal organization structures. The course uses case analyses of companies and a combination of class discussion and a combination of class discussion and lecture to examine these topics. Must be enrolled in one of the following Program(s): MBA. Offered Fall. Instructor(s): Weigelt.

**MGMT 667 CORPORATE FINANCE FOR NON-FINANCIAL MANAGERS (2)**

Focuses on essentials of corporate finance for students who do not wish to pursue finance-oriented careers. It builds on the basic principles of valuation, financing, and budgeting, and introduces personal taxes, agency problems, real options, and mergers and acquisitions. The emphasis is on an overview of leading financial theories, empirical evidence, and case studies and requires an understanding of the basic principles of finance. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year.

**MGMT 668 INTERNATIONAL TRADE (3)**

An overview of the economic and political environment of international trade, foreign investment, and competitiveness, focusing on institutions that affect international commerce. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Schuler.

**MGMT 669 BUSINESS STRATEGY IN THE ENERGY INDUSTRY (1.5)**

This course is designed to examine business in the energy industry from a strategic standpoint, and provide students with a basic understanding of major business issues in the energy industry, including historical and current events. Emphasis will be on oil and gas, but may also touch on other energy subset such as utilities. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall. Instructor(s): Papadopolous.

**MGMT 670 STRATEGIC PLANNING AND CREATIVITY (3)**

Examination of strategic planning approaches and methods for managing 21st Century organizations. Emphasizes design and implementation of planning systems that are highly responsive to the dynamic, competitive, stakeholder-influenced planning contexts facing modern organizations. Examples of excellent planning performed by a variety of actual companies and industries are analyzed. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Taylor.

**MGMT 671 CORPORATE CRISIS MANAGEMENT AND COMMUNICATION (1.5)**

Studies current methods of crisis communications with practical application utilizing numerous recent real-world case studies. Class will research and prepare strategies, make recommendations, then dissect and analyze each crisis situation, the processes, policies and results. This process will enhance strategic thinking, allow the consideration of pros and cons of alternative courses of action and provide a better understanding of the management decision making process. Class time will be interactive with individual and small group participation. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Hemeyer.

**MGMT 673 STRATEGIC INTEGRATION OF MARKETING COMMUNICATIONS (3)**

The course will focus on strategic planning, development, and execution of integrated marketing communications programs. In order to design programs that achieve maximum impact, we will survey all elements of the promotion mix- advertising, personal selling, public relations, sales promotions, sponsorship, direct response and interactive marketing. The emphasis of this course is on practical application of marketing communications in both consumer and business markets. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 580. Repeatable for Credit. Not offered this academic year. Instructor(s): Mendoza.

**MGMT 674 PRODUCTION AND OPERATIONS MANAGEMENT (3)**

Introduce students to the key issues facing managers regarding the operations management of their companies. The goal is to expose students to operations management issues they may face in general management or financial management of companies, either in the manufacturing or service sectors. Topics include: Just In Time (Lean) Production, Total Quality Management, Statistical Process Control (Six Sigma), The Theory of Constraints, Business Process Re-engineering, Supply Chain Cost Management, Leadership Skills in Operations, and Participative Management. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 574 or MGMP 574 or MGMP 574. Repeatable for Credit. Offered Fall. Instructor(s): Flatt.

**MGMT 675 MANAGEMENT OF INNOVATION (1.5)**

This course is a study in the creation and maintenance look of competitive advantage through both incremental and radical innovation. We learn to formulate innovation strategies consistent with a firm's business strategies. We study processes, management systems, and organizational structures that promote and support innovation. The scope of the course ranges from new product development to business model innovation. We also seek to understand the key drivers of innovation and sources for new ideas. The focus is primarily on large firms. The perspective is that of general management. Readings and case studies are used. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Austgen.

**MGMT 676 SOCIAL ENTERPRISE (1.5)**

Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit.

**MGMT 678 U.S. HEALTH CARE MANAGEMENT (1.5 TO 3)**

Sequence of offerings that provides an introduction to the business of health care in the U.S. Topics include health care systems, health service organizations, and issues relating to the aging problem and the technology explosion in health care. Required elective for MD/MBA's dual degree students. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Whitney.

**MGMT 679 COST AND QUALITY IN HEALTH CARE (1.5 TO 3)**

Sequence of offerings that provides further analysis of the business of health care in the U.S. Topics include issues of cost and quality, health care financial management, and national and international solutions to the challenge of providing health care to a population. This class is designed to stand-alone, yet builds upon MGMT 678. Required elective for MD/MBA dual degree students. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Whitney; Boom.

**MGMT 680 CUSTOMER SATISFACTION AND LOYALTY (3)**

Introduction to major concepts in the analysis of customer satisfaction and loyalty, with emphasis on managerial applications. Also examines related consumption and post-purchase phenomena related to customer satisfaction and loyalty. Open only to second-year MBA students. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 580. Repeatable for Credit. Offered Spring. Instructor(s): Westbrook.

**MGMT 682 PRICING STRATEGIES (3)**

Study of the paradigm that success of a product lies not only in its acceptance by the end consumer but also in how it is priced and how it reaches the intended consumer, with emphasis on understanding and analyzing the issues, problems, and opportunities characteristic of the channel relationship and of the various faces of pricing. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Dholakia.

**MGMT 683 SERVICE MARKETING AND MANAGEMENT (3)**

Exploration of challenges in the marketing of services, with emphasis on service quality, the importance of cross-functional interactions, and the development of breakthrough service organizations. Examines the differences between marketing services and marketing products, service quality, customer satisfaction, the design of services, and service guarantees, by using lectures, discussions, and case analyses. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year.

**MGMT 684 BRAND MANAGEMENT (3)**

Application of various dimensions of marketing strategy and management to the role of the product manager responsible for all marketing activities of a given product. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 580 or MGMP 580. Repeatable for Credit. Offered Fall. Instructor(s): Perkins.

**MGMT 686 MARKETING RESEARCH (1.5)**

The objective of the course is to provide a comprehensive look at the marketing research process and the associated data collection techniques that can be used to collect information to better manage the marketing mix. Qualitative, survey-based, and experimental research designs will be discussed. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 580 or MGMP 580. Offered Spring. Instructor(s): Singh.

**MGMT 687 MARKETING STRATEGY (3)**

Considers key elements of marketing strategy, namely, segmentation, targeting, positioning, new product introduction, product line policies, competition. Also treats development of strategic marketing plan. The concepts are discussed through cases, lectures, and a simulation game called MARKSTRAT. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 688 BUYER BEHAVIOR (3)**

Drawing on established theoretical frameworks of cognitive and social psychology, this course examines three aspects of consumer behavior: (1) individual, social and cultural influences on consumers, (2) psychological mechanisms of pre- and post-consumption processes such as decision-making and attitude formation and change, and (3) methodological issues in consumer analysis. Implications for strategy as well as marketing program design, measurement and execution are discussed. These topics will be studied through discussion of academic articles, cases and projects. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall.

**MGMT 689 MARKETING MODELS (3)**

Development and analysis of state-of-the-art marketing models that utilize consumer-level data and statistical software packages (SAS, SPSS, and GAUSS) to uncover the various key marketing measures such as price and advertising elasticities, to study the impact of promotions and advertising on sales, to analyze the diffusion of new products such as answering machines and cellular phones, and to do segmentation and market structure analysis. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 692 MARKETING FOR HIGH TECHNOLOGY INDUSTRIES (2)**

Examines the opportunities and challenges of marketing on the Internet, focusing on 3 areas: strategy, communications and consumers. First, we consider strategic issues facing internet marketers, and examine emerging and traditional theoretical frameworks and concepts of value. Second, we examine the media characteristics and potential of the digital environment, and compare it to traditional forms of marketing communication. Third, we study demand-side issues, examining consumer behavior in digital environments with implications for marketers. These topics will be studied through cases, discussions of academic and trade articles, and projects. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Dholakia.

**MGMT 693 NEW PRODUCTS (3)**

Exploration of the critical role of new products within the corporation and in small businesses, focusing on consumer products. Discusses the critical steps in new product development from ideal generation to business analysis and cross-functional team management to product launch into the marketplace. Students will work in groups to develop their own new products and to prepare the key elements of a new product introduction. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Spring. Instructor(s): Singh.

**MGMT 694 ADVERTISING CREATIVITY (1)**

Many CEOs and Marketing Managers are not trained how to evaluate advertising creativity or ad content even though advertising plays a key role in a company's/product's marketplace performance. Advertising Creative Management will provide a basic framework for managing and evaluating advertising creativity with a focus on television ads. The course will include lectures, numerous advertising samples for discussion, a guest speaker and two assignments. There will not be a final exam. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 695 TRADING ROOM SEMINAR (1)**

Independent projects based on data, software, and analysis techniques developed in the Jones School trading room. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 696 MARKETING FOR FINANCIAL SERVICES INDUSTRIES (1)**

The objective of this course is to help participants better understand market research data and special research techniques, including test marketing, advertising research, and new product research. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Dhoakia.

**MGMT 697 ADVERTISING AND PROMOTION (3)**

This course will take an Integrated Marketing Communications approach to the development, implementation and control for advertising and promotion programs. We will examine the role of Integrated Marketing Communications in marketing, setting objectives and budgets, development, monitoring, evaluating for advertising, direct marketing, public relations, and sales promotion programs. Must be enrolled in one of the following Program(s): MBA. Prerequisite(s): MGMT 580. Repeatable for Credit. Not offered this academic year. Instructor(s): Yoon.

**MGMT 699 ADVANCED MARKETING RESEARCH (3)**

In this course, we develop a thorough understanding surrounding the design of studies to measure perception and preference in a market. Topics include: Projective Techniques, Multidimensional Scaling, Factor Analysis, Conjoint Analysis, and Choice Models. Design of data collection instruments, collection, analysis, and reporting of results are emphasized in a project context. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 700 INDEPENDENT STUDY (1 TO 3)**

Independent study or directed reading on an approved project under faculty supervision. Contact MBA program office for application information. No more than 3 credit hours of independent study will count towards graduation unless approved by the Jones School Academic Standard Committee. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall & Spring.

**MGMT 701 MANAGEMENT CONSULTING (1.5)**

This course will introduce students to the basics of management consulting, with a focus on what it means to be a successful management consultant. The course will include instruction on managing client relations and projects, determining and controlling the scope of engagements, working effectively in, and leading client teams, and integrating strategic/analytic, organizational/process, and behavioral/anthropological disciplines into lasting impact for clients. Class work will include case studies, role-play, and interaction with real clients. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Offered Fall. Instructor(s): Kurtzman.

**MGMT 702 MEXICO STUDY ABROAD (1 TO 1.5)**

This class, conducted entirely in Mexico, is a language, culture, business practices and specific business language training in Mexico. It will be held January 2-11 and requires travel to Mexico City and Cuauhnahuac, Mexico. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): VanDrie.

**MGMT 703 FIELD STUDY IN AMERICAN BUSINESS I (0)**

The purpose of this course is to expose students to the American business enterprise. This exposure is accomplished through two primary means: (1) readings about the drivers of success in U.S. firms; and (2) a summer internship with a firm in the United States. The readings are meant to complement much of your course work in the first year of the MBA program. A final paper is due at end of summer to summarize experience. Must be enrolled in one of the following Program(s): MBA. Instructor permission required. Recommended prerequisite(s): CPT course required for International students to get authorization to work in U.S. Offered Summer. Instructor(s): VanDrie.

**MGMT 704 FIELD STUDY IN AMERICAN BUSINESS II (0)**

The purpose of this course is to expose students to the American business enterprise. This exposure is accomplished through two primary means: (1) readings about the drivers of success in U.S. firms; and (2) a fall internship with a firm in the United States. The readings are meant to complement much of your course work in the second year of the MBA program. Report due at end of term summarizing work experience. Must be enrolled in one of the following Program(s): MBA. Offered Fall. Instructor(s): VanDrie.

**MGMT 705 FIELD STUDY IN AMERICAN BUSINESS III (0)**

The purpose of this course is to expose students to the American business enterprise. This exposure is accomplished through two primary means: (1) readings about the drivers of success in U.S. firms; and (2) a spring internship with a firm in the United States. The readings are meant to complement much of your course work in the second year of the MBA program. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): VanDrie.

**MGMT 706 MANAGEMENT OF TECHNOLOGY (1)**

This course is a study in the creation and maintenance of competitive advantage through the development and exploitation of technology in both core products and enabling processes. We study the formulation and implementation of technology strategy and seek to understand how new and improved technologies are exploited through innovation. We learn to formulate technology strategy. We explore the appropriate scope and dimensions of technology strategy, forces that shape it, processes for crafting it, and integration of technology strategy into the firm's corporate-and business-level strategies. We also study processes, management systems, and organizational structures that promote effective technology development. The focus is primarily on large firms. The perspective is that of general management. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Merrill.

**MGMT 707 BUYER BEHAVIOR II (1)**

The objective of this course is to understand the psychological mechanisms underlying important marketing processes. In particular, we will examine the psychological bases of customer satisfaction, loyalty, relationship marketing, and branding. In each case, drawing on psychological theoretical frameworks, we will understand what these constructs mean from the consumer's standpoint, and how managers should take these meanings into account during planning, creating and executing marketing strategies. It is expected that this knowledge will benefit not just students interested in a marketing emphasis, but those in general management and finances as well, in evaluating the implications of their functional responsibilities on their firm's top-line through influencing customer processes and behaviors. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Not offered this academic year. Instructor(s): Dholakia.

**MGMT 708 STRATEGIC MARKET ANALYSIS (1.5)**

In rapidly changing business environments, with global competition and maturing markets, demonstrating in-market growth and competitive advantage is extremely important. This class explores how companies utilize existing information and custom data to create frameworks that facilitate strategic growth-oriented decisions. Class sessions will emphasize experimental learning and will include a combination of case studies, real-time business examples and hands-on fieldwork where applicable. Must be enrolled in one of the following Level(s): Graduate. Must be enrolled in one of the following Program(s): MBA. Prerequisite(s): MGMT 580. Repeatable for Credit. Offered Fall. Instructor(s): Connell.

**MGMT 709 STRATEGIC MARKET ANALYSIS II (1.5)**

Must be enrolled in one of the following Program(s): MBA. Instructor(s): Connell.

**MGMT 710 LEADERSHIP ILE (.75)**

Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit.

**MGMT 711 NEGOTIATIONS ILE (.75)**

Development of analytical and behavioral skills for effective negotiation, including topics such as diagnosing conflict, decision making, adversarial versus cooperative strategies, ethical and cultural factors, and third-party intervention. Required for MBA Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit.



**MGMT 712 DATABASE MARKETING (3)**

This course on Database Marketing will provide students with an understanding of 1.) The managerial issues related to database marketing and customer relationship management, 2.) The importance of integrating internal processes with customer relationship management processes, 3.) Technology issues in developing relationship tools such as data architecture, data warehousing, content personalization, etc. 4.) Data models used in understanding and predicting customer behavior for improved customer relationships from large databases, and will provide students with the ability to develop and utilize specific data mining techniques to integrate customer data and business processes. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Pre-requisite(s): MGMT 580 or MGMP 580. Repeatable for Credit. Offered Fall. Instructor(s): Seetharaman.

**MGMT 713 STRATEGIC ISSUES FOR GLOBAL BUSINESS (1.5)**

Seeks to provide students with the skills, knowledge and sensitivity required to attain and maintain sustainable competitive advantage within a global environment. Emphasizes a strategic perspective and highlights topics such as global environment analysis, global strategy, global strategic alliances, and the important role of organizational structure and strategic control. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Zhang.

**MGMT 715 STATE INNOVATION AND COMPETITIVE ADVANTAGE IN TECHNOLOGY (1.5)**

This course will help students apply the key strategic management frameworks and concepts into the innovation management context in technology industries and help them understand that innovation is an essential and integral part of strategic management. Within this strategic perspective, this course draws upon strategic management, organization theory, product innovation, and technology management for analytical tools to address important challenges faced by managers in technology-based firms. Must be enrolled in one of the following Program(s): MBA. Instructor(s): Li.

**MGMT 716 DESIGN AND CONSTRUCTION PROJECT DELIVERY INNOVATION (3)**

Process innovation in the design and construction industries is far to rare. Even with access to powerful tools such as CADD and the Internet, many opportunities for process improvement are overlooked and problems are repeatedly ignored. Within this course, cross-discipline project teams will use contemporary business tools to evaluate long-standing industry practices and develop ideas for process innovation. At the end of the semester, students will present innovation concepts to members of the Project Delivery Innovation Forum, a group of industry leaders that may select student ideas for further research on real projects. Cross-listed with ARCH 616. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Bryson.

**MGMT 717 GLOBAL LEADERSHIP (1 TO 3)**

Must be enrolled in one of the following Program(s): MBA. Not offered this academic year.

**MGMT 719 THINKING STRATEGICALLY (1.5)**

Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit.

**MGMT 720 STRATEGY AND MANAGING INTERNATIONAL STRATEGIC ALLIANCES (1.5)**

This course seeks to provide students with the skills, knowledge, and sensitivity required to structure and manage strategic alliances/joint ventures within a global environment. This course will discuss the following topics: motivations for joining strategic alliances/joint ventures, partner selection, structuring strategic alliances/joint ventures to meet firms' strategic objectives, control and management of alliances/joint ventures, evaluation of performance of alliances/joint ventures, and exiting alliances/joint ventures. Case studies will also be used to develop students' capacity to identify issues, to reason carefully through various options and improve students' ability to manage the organizational process by which alliances/joint ventures get formed and executed. We will also read and discuss recent articles from the business press and academic journals. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Zhang.

**MGMT 722 MANAGEMENT CONTROL AND DESIGN (1.5)**

This course builds on and extends the topics introduced in MGMT 503, Management Control. It is situated at the intersection of strategy and control and will focus on the use and design of control systems to facilitate strategic objectives and achieve business goals. It will begin by taking an in-depth look at the levers of control typology introduced in MGMT 503. The course will examine incentive issues that arise when compensation is linked to diagnostic controls, and whether it facilitates or hinders the achievement of strategic objectives. The course then shifts to examine the presence of strategic risks and how strategic pressures impact the accounting environment. Finally, it will examine how a component of the management control system is used to manage those risks. It will also include the current changes in management control and the requirements now imposed on top executives. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Spring. Instructor(s): Widener.

**MGMT 724 STRATEGIC ALLIANCES AND JOINT VENTURES (1)**

In today's world of global markets, rapid technological advancement, and increasing complexity of new products, few companies can successfully compete alone. As such, for industry giants and ambitious start-ups alike, strategic partnerships have become critical. The Strategic Alliance and Joint Ventures course will examine the theory and logic of alliances in value creation as well as exploring the life cycle of an alliance. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year. Instructor(s): Foote.

**MGMT 725 STRATEGIC ALLIANCES AND JOINT VENTURES II (1)**

This course examines: theory and logic of alliances in value creation, alliance evolution in various industries, the spectrum of alliance types from a low level of interdependence to a high. The course is discussion-based, focusing on reading material, case studies and problem sets. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 724. Not offered this academic year. Instructor(s): Foote.

**MGMT 726 FIXED INCOME PORTFOLIO SIMULATION (2)**

In this course, students will gain hands-on experience in the challenges and excitement of managing a simulated Fixed Income portfolio (U.S. Treasuries, corporate bonds and mortgages). FIP Sim 'studentmanagers' will actively learn and utilize the resources of the El Paso Finance Center to set up, research, and manage/trade their simulated portfolios. Each portfolio will consist of securities selected by the 'student manager' from an index in conformance with pre-established investment guidelines -analogous to the real investment management world. Monthly portfolio performance will be calculated and benchmarked against the index. Classroom time will be used for a combination of lectures, speakers, interactive Finance Center activities, and professor/student consultation sessions on investment strategy. This course work will leverage off of material learned in MGMT 651, and to receive credit, you must simultaneously take MGMT 651. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Foote.

**MGMT 730 ADVANCED INVESTMENT MANAGEMENT (3)**

Advanced theory and practice in investment management, including security analysis, optimal asset allocation for active fund managers, dynamic portfolio insurance programs, arbitrage-free pricing, bond fundamentals and arbitrage, and interest rate swaps and derivatives. Must be enrolled in one of the following Program(s): MBA. Pre-requisite(s): MGMT 543. Offered Spring. Instructor(s): Xing.

**MGMT 732 LEADERSHIP COMMUNICATION ILE (0)**

Must be enrolled in one of the following Program(s): MBA. Offered Fall. Instructor(s): Wiley; Elliott.

**MGMT 734 TECHNOLOGY ENTREPRENEURSHIP (3)**

Through exposure to literature on technology entrepreneurship and active involvement with technology entrepreneurs, the student will deepen his/her knowledge of the process of starting, funding, and growing an entrepreneurial company that is based on a science, engineering, software, or e-commerce innovation. Involvement with technology entrepreneurs will be made through the Rice Alliance for Technology and Entrepreneurship. Must be enrolled in one of the following Program(s): MBA. Not offered this academic year. URL: [www.alliance.rice.edu](http://www.alliance.rice.edu). Instructor(s): Currall.

**MGMT 737 INVESTOR RELATIONS (1.5)**

Students learn theory and practice of investor relations, with emphasis on the role of investor relations/financial communications. Subjects covered include: history of the stock market, formation of the SEC, evolution of SEC regulations, dynamics of the equity markets, flow of investor information, planning and implementing an investor relations program, fitting investor relations into a corporation's communications program. Students will be mentored by local investor relations practitioners who will serve as real world guides for course assignments. Students will learn specifics about filing with the SEC, the creation of annual reports, road shows, stockholder meetings, preparing financials, and more. Investor relations managers, analysts, and CEOs will serve as guest lecturers to talk about their challenges in today's workplace. only. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Wiley.

**MGMT 739 DELIVERING EMPLOYEE, CUSTOMER & SHAREHOLDER VALUE (1.5)**

The course delivers fundamental concepts of how a company delivers value to its primary stakeholders. Successful business models are examined and analyzed. Successful companies will be examined, primarily in the way of delivering value. The course will highlight what constitutes a good value chain and why. A portion of the course will revolve around the definition of value and the formulation of a "value proposition". A delineation will be made in the formulation of the "value proposition" for companies with different value disciplines. Real examples and case studies will be shared with the students derived from many years of the instructors' consulting experience with internal and external customers in their pursuit to provide satisfaction to all three major stakeholders: Customers, Employees, and Shareholders. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Merrill; Papadopoulos.

**MGMT 741 MANAGING GROWTH (1.5)**

Companies are either thought of as small start-ups or large, mature businesses. The small start-up is considered to be the domain of the entrepreneur, where by force of personality, spark of creativity, or bold opportunism, a business is formed *ex nihilo*. On the other extreme, the large business is considered to be the domain of the manager, where by force of scale and scope, imposition of process, and careful analysis, an empire is sustained and expanded. In summary, the focus of the course will be how to create wealth by buying a small business, putting systems and processes in place to create a foundation for future growth, driving growth both internally and externally, and, finally, selling the business. Students will learn to apply those skills to small businesses with growth potential. Must be enrolled in one of the following Program(s): MBA, MBA for Professionals. Repeatable for Credit. Offered Fall. Instructor(s): Linbeck; Morgan.

**MGMT 750 MANAGEMENT FOR SCIENTISTS AND ENGINEERS (3)**

This course is designed for science and engineering students who want to understand the management of new and/or small technology-based businesses. The course is taught in modular format to give students insights into how technology-oriented firms manage intellectual property, marketing, organization behavior, strategy, accounting, and finance. Concepts covered will be particularly relevant to students interested in careers in technology or entrepreneurial ventures. This course is part of a two-class sequence and provides the foundation for students taking NEW VENTURE CREATION for SCIENCE and ENGINEERING, which is offered in the spring. May not be enrolled in any of the following Program(s): MBA Executive Program, MBA. Not offered this academic year.

**MGMT 751 NEW VENTURE CREATION FOR SCIENCE AND ENGINEERING (3)**

This course deals with the concepts and theories relevant to new venture creation. Our primary focus is the start-up process with particular emphasis being placed on market issues, intellectual property and entrepreneurial finance. As part of the course, we will evaluate the commercial potential of a live technology drawn from the Rice engineering/science community. The concepts covered will be particularly relevant to students who are interested in careers in technology or entrepreneurial ventures. Not offered this academic year.

**MGMT 752 TECHNOLOGY TRANSFER INTERNSHIP (3)**

The Office of Technology Transfer at Rice University has currently established a formal internship program with the Jones Graduate School of Management (JGSM) to provide students exposure and experience with the process of transferring technology discovered in research activities at Rice to commercial activities. The program allows students to work directly with the Office of Technology Transfer. Technology Transfer is the process of facilitating the relationship between academia and industry, allowing ideas to flow or be transferred both ways and resulting in the development of technologies. This benefits the public through introducing new and better products for the improvement of quality of life. The national economy benefits as these technologies mature to grow their own industry and contribute to other sectors of the economy as well. Must be enrolled in one of the following Program(s): MBA. Offered Spring. Instructor(s): Napier.

**MGMT 753 HOUSTON ANGEL NETWORK (3)**

The Houston Angel Network (HAN) is establishing a formal internship program with the Jones Graduate School of Management (JGSM) at Rice University in order to give students exposure and experience with evaluating and funding early-stage companies within Houston. The program will allow students to work directly with start-up companies seeking funding and with HAN itself. The program will be beneficial for both HAN, by providing experienced volunteers, and the Jones school students, by giving them a chance to apply the knowledge they gain in the classroom to the real world funding process, which all start-up companies face. Interns will be required to sign a confidentiality agreement before the HAN Internship begins. Registration by application. Must be enrolled in one of the following Program(s): MBA. Limited enrollment. Offered Fall & Spring. Instructor(s): Napier.

**MGMT 754 AEGIS CAPITAL GROUP INTERNSHIP (3)**

Aegis Capital Group (AEGIS) has established a formal internship program with the Jones Graduate School of Management (JGSM) at Rice University in order to give students exposure and experience working within a venture capital/private equity firm. The program allows students to work directly with early stage and high-tech companies located in Texas. Interns will be engaged in working to provide due diligence, create business plans, offering memorandums and fund raising documents for various portfolio companies. Depending on the level of experience, the intern may also help in packaging companies for institutional financing with major venture players and corporate investors. The program should allow Jones school students to directly experience the workings of the venture capital/private equity environment and see the real world problems all early-stage companies face. Offered Fall. Instructor(s): Napa.

**MGMT 759 APPLIED RISK MANAGEMENT II (1)**

This course is a combination of lectures and projects providing a broad foundation in financial risk management and an opportunity to explore risk management concepts and apply risk management skills on focused projects. The practice of financial risk management has changed greatly over the past decade and is still rapidly evolving. Students in this course will get to apply their knowledge from prior courses on a real-world problem while working in a team environment. You will work in 2-3 person teams of students on one of two prepared projects. Pre-requisite(s): MGMT 648 and MGMT 642. Corequisite(s): MGMT 658. Not offered this academic year.

**MGMT 760 HOUSTON TECHNOLOGY INTERNSHIP (3)**

The Houston Technology Center (HTC) is working to enhance Houston's position as a leading city for technology companies and has established a formal internship program with the Jones Graduate School of Management (JGSM) to give students exposure and experience with high-tech companies within Houston. The program allows students to work directly with high-tech companies and with the HTC itself. The program provides Jones school students the chance to apply the knowledge they gain in the classroom to the real world problems, which all start-up companies face. Must be enrolled in one of the following Program(s): MBA. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Napier.

**MGMT 761 ALPHADEV INTERNSHIP (3)**

AlphaDev's mission is to develop inventions into successful medical companies and products; we source the world for the best ideas and bring them to Houston to actively manage; we specialize in driving inventions to market by weaving together proven entrepreneurial management and efficient allocation of capital; our life science focus includes: biotech, pharmaceuticals, devices & diagnostics; we get a minority equity stake and a share in the intellectual property; we only make money when the invention makes money. AlphaDev also develops juniors into entrepreneurs, through a partnership with HOLSTEIN- the Houston Life Science Technology Entrepreneurship Institute, a non-profit organization. Instructor(s): Napier.

**MBMT 762 DFJ MERCURY INTERNSHIP (3)**

DFJ Mercury has established a formal internship program with the Jones Graduate School of Management (JGSM) at Rice University in order to give students exposure and experience with an early-stage, Houston-based technology venture capital firm. The program will allow students to work directly with DFJ Mercury and a number of its portfolio investments. We believe this program will be beneficial for both DFJ Mercury, by providing us with experienced MBA students to perform deal analysis and review, and the Jones school students, by giving them a chance to apply the knowledge they gain in the classroom to the real world problems, which all start-up companies face. The program will also allow great networking opportunities for MBA students interested in venture capital and technology start-ups and could provide students future employment opportunities. Repeatable for Credit. Offered Fall. Instructor(s): Napier.

**MGMT 763 NASA JOHNSON SPACE CENTER INTERNSHIP (3)**

The NASA Johnson Space Center (JSC) has established a formal internship program with the Jones Graduate School of Management (JGSM) at Rice University in order to give students exposure and experience with high-tech companies. The program will be administered through the JSC Technology Transfer Office (TTO). The program will allow students to work directly with NASA engineers and scientists and high-tech companies. The program will be beneficial for the both the JSC TTO, by providing experienced volunteers, and the Jones School students, by giving them a chance to apply the knowledge they gain in the classroom to the real world problems which all high-tech companies face. The program will also allow great networking opportunities for graduate students interested in pursuing a career in the high-tech field. Repeatable for Credit. Offered Fall. Instructor(s): Napier.

**MGMT 764 SIMPLEXITY MD INTERNSHIP (3)**

Simplexity MD has established a formal internship program with the Jones Graduate School of Management (JGSM) at Rice University in order to give students exposure and experience with creating entrepreneurial medical device companies in Houston. The program has allowed students to work directly with medical device entrepreneurs in nearly all aspects of startup business. The program has been beneficial for both the Simplexity MD, by providing experienced volunteers, and the Jones school students, by giving them a chance to apply the knowledge they gain in the classroom to the real world problems, which all start-up companies face. The program has also allowed great networking opportunities for graduate students interested in the growing high-tech field and could provide students future employment opportunities. Repeatable for Credit. Instructor(s): Napier.

**MGMT 765 M-C MCLANE INTERNATIONAL INTERNSHIP (3)**

M-C McLane International is proud to partner with the Jones Graduate School of Management (JGSM) at Rice University in an effort to allow MBA students an opportunity for growth and exposure to the world of import/export. This program will allow students to work directly with our logistics manager for "hands on experience" in the area of global logistics. The program represents a real world view of the global logistics industry for those interested in exploring a career in international trade. Repeatable for Credit. Offered Fall. Instructor(s): Napier.

**MGMT 770 CONSULTATIVE SELLING (1.5)**

This course introduces students to the communications skills and behaviors required for success in the field of consultative selling, including effective questioning, active listening, client learning style and personality assessment, creating and delivering persuasive presentations, and proposal writing. Offered Spring.

**MGMT 781 TEAM DYNAMICS I (3)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 782 TEAM DYNAMICS II (1)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 786 INTERNATIONAL BUSINESS BRIEFING (1.5)**

An overseas course trip involving intensive meetings with company and commercial bank executives, directors in consulting and investment banking firms, executives in public sector and health care enterprises, and government officials and academics. The objective is to enhance students' appreciation of the opportunities and obstacles to doing business in different parts of the world and to heighten their interest in engaging in global ventures. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Uecker.

**MGMT 787 CROSS-CULTURAL ISSUES IN BUSINESS (1.5)**

Introduction to cultural business differences and discussion of problems and obstacles to business caused by non-synchronous historical and political viewpoints. Emphasizes management challenges to non-American and multicultural environments where values, practices, negotiation styles, concepts of time and methods of communication are dissimilar. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Lesnick; Currall.

**MGMT 790 LEADERSHIP DEVELOPMENT (.5)**

Extended Learning Labs are directed jointly by the four faculty members responsible for any given mini-semester. Their purpose is to apply information from each of that mini-semester's subject areas in practical, real-world setting such as cases, simulations, and communication exercises. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 791 FINANCIAL REPORTING AND ANALYSIS (1.5)**

This course is designed to increase your ability to extract and interpret information in corporate financial statements. This course will focus on developing your skills in accounting analysis, using the disclosures in a firm's annual and quarterly reports to determine accounting policy choices, and assessing how those choices affect the firm's primary financial statements. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Nelson.

**MGMT 792 INVESTMENTS / PORTFOLIO MANAGEMENT (1.5)**

This course examines the determinants and behavior of asset prices and provides a framework for portfolio management. We rely on both financial theory and analytical tools. Topics covered will include asset pricing models, market efficiency, asset allocation, portfolio management, and performance evaluation. The course is designed to provide a conceptual understanding of investment returns and portfolio management processes coupled with a strong quantitative focus that develops analytical tools and spreadsheet modeling techniques. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 793 NEW PRODUCTS (1.5)**

This course is to explore various issues and problems that are faced by marketing managers in making decisions on the design and marketing of new products. The course is intended to acquaint students with the idea of a new product development process such as opportunity identification, product design, pretest and test marketing, launching and profit management. Must be enrolled in one of the following Program(s): MBA Executive Program. Repeatable for Credit. Limited enrollment. Instructor(s): Singh.

**MGMT 794 STRATEGIC MARKET ANALYSIS I (1.5)**

In rapidly changing business environments, with global competition and maturing markets, demonstrating in-market growth and competitive advantage is extremely important. This class explores how companies utilize existing information and custom data to create frameworks that facilitate strategic growth-oriented decisions. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Connell.

**MGMT 800 INDEPENDENT STUDY (.5 TO 3)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Repeatable for Credit.

**MGMT 801 FINANCIAL ACCOUNTING (3)**

Preparation of financial statements, financial reporting framework and financial accounting techniques. Must be enrolled in one of the following Program(s): MBA Executive Program. Repeatable for Credit. Instructor(s): Nelson.

**MGMT 802 COST MANAGEMENT (1.5)**

Provides general managers with an understanding of the design and function of a firm's management accounting system to enable them to become active consumers of accounting information. The course describes how accounting information can assist managers in making decisions about products, services, and customers; improving existing processes; and aligning organizational activities toward long-term strategic objectives. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Anderson.

**MGMT 804 ADVANCED COMPETITIVE STRATEGY: INTEGRATING THE ENTERPRISE (2.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Wiersema

**MGMT 805 FINANCIAL STRATEGY (2.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Kanatas.

**MGMT 806 EXECUTIVE LEADERSHIP CAPSTONES (2)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 807 LEADERSHIP (1.5)**

Covers key elements of sound leadership theory and practice in organizational settings. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Windsor.

**MGMT 808 MARKETING STRATEGY (2.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Pazgal.

**MGMT 809 ORGANIZATIONAL BEHAVIOR (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 810 LEADING ORGANIZATIONS (1.5)**

This course is designed to further students' leadership skills by providing an assessment of their leadership competencies. This assessment will be used to focus participants' leadership development efforts. Additionally, the course will cover the common causes of executive derailment, critical competencies for effective leadership, leadership as coaching, leading decision-making in teams, and managing change. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 811 CHANGE MANAGEMENT (1.5)**

Examination of practical challenges in planning and in implementing organizational change. Topics include organizational transformation, continuous change, choices in organizational change initiatives, leadership of organizational change and transformation at different organizational levels, and motivation and resistance around change efforts. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 812 APPLIED FINANCE (1.5)**

Study of the theory and practice of the fundamental principles in finance emphasizing hands-on experience with a wide range of corporate finance and investments applications. The course provides extensive opportunity to implement finance theory at a practical level and to develop advanced analytical spreadsheet expertise. Must be enrolled in one of the following Program(s): MBA Executive Program. Offered Fall. Instructor(s): Hund.

**MGMT 813 MANAGING FOR CREATIVITY (1.5)**

Study of the nature of creativity, creative thinking skills and ways to encourage, promote, and effectively manage creativity and innovation in complex organizations. Must be enrolled in one of the following Program(s): MBA Executive Program.. Limited enrollment. Instructor(s): Zhou.

**MGMT 817 DECISION STRATEGIES (2.5)**

Decision analysis is the discipline that helps people choose wisely under conditions of uncertainty. Decision analysis provides the only logical, consistent way to incorporate judgments about risks and uncertainties into an analysis. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Skinner.

**MGMT 820 COMPLEXITIES OF PEOPLE AND ORGANIZATIONS (1.5)**

A seminar focused on contemporary issues in organizational behavior. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): George.

**MGMT 821 STRATEGY MANAGEMENT OF TECHNOLOGICAL INNOVATION (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Weigelt.

**MGMT 822 INTELLECTUAL PROPERTY AND TECHNOLOGY COMMERCIALIZATION (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 823 MANAGEMENT CONTROL (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Uecker.

**MGMT 830 STRATEGIC IT (1.5)**

The role and impact of information technology (IT) in organizations, strategic uses of IT, the internet and electronic commerce, outsourcing versus in-sourcing of IT activities, technology directions and management of the IT function. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Gorry.

**MGMT 831 IT AND SOCIETY (1.5)**

Our increasing use of information technology is profoundly affecting the ways in which we live, work, and think about the world around us. For example, the pervasive use of computers and networks is changing our ideas about property, privacy, security, authority, social relations, knowledge, and identity. Such changes have many consequences for business, and in this course, we will explore some of the most important of these. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Gorry.

**MGMT 835 MANAGING KNOWLEDGE IN THE INFORMATION AGE (1.5)**

People processes and technology. Technology for managing knowledge. New organizational models. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 840 MANAGERIAL ECONOMICS (1.5)**

Part I of the course first covers the basics of consumer demand and then focuses on the relevant costs in making production and pricing decisions, with an emphasis on seeking economics rather than accounting profit. Part II explores incentive problems in decision-making within firms and studies the relation between decision rights, compensation, and performance evaluation in productive organizational design. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Paye.

**MGMT 841 ECONOMIC ENVIRONMENT OF BUSINESS (1.5)**

Examination of the global economic environment that serves as a backdrop for business decision making, with emphasis on the key macroeconomic policy goals and tools and how they affect exchange rates, interest rates, business cycles, and long-term economic growth. Must be enrolled in one of the following Program(s): MBA Executive Program.. Instructor(s): Ostdiek.

**MGMT 843 CORPORATE FINANCIAL MANAGEMENT (3)**

Capital budgeting, risk and return, cost of capital, EVA concept, capital asset pricing model, time value of money, net present value, and internal rate of return. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Underwood.

**MGMT 845 CAPITAL INVESTMENT ANALYSIS (1.5)**

This course examines quantitative techniques for evaluating capital investment opportunities for corporations. In addition, the course will analyze cases to examine the use of those techniques in making capital investment decisions. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Atherton.

**MGMT 858 ENTERPRISE-WIDE RISK MANAGEMENT (1.5)**

This course explores the responsibilities for risk management from the top levels - the corporate directors - down to the roles of the internal audit department, risk control, and risk management groups, and examines an organization's internal risk management structure and the thought process for identifying key risks. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 860 BUSINESS ETHICS (1.5)**

Moral obligations of firms and managers. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Windsor.

**MGMT 861 BUSINESS-GOVERNMENT RELATIONS (1.5)**

The course exposes students to the governmental institutions that surround the business environment. Strategies for influencing and responding to governmental factors are explored as well as other issues related to business-government relations. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 865 GLOBALIZATION OF BUSINESS (1.5)**

This course examines the increasing importance of trade and the global economy to U.S. business. It focuses first on the industrial winners and losers of free trade and protectionism, and then examines the major laws and agencies governing trade between the U.S. and her industrial competitors. Finally, the course examines current issues and challenges for foreign investment in some of the most important markets for U.S. firms such as Japan and China. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Schuler.

**MGMT 869 BUSINESS STRATEGY IN THE ENERGY INDUSTRY (1.5)**

This course is designed to examine business in the energy industry from a strategic standpoint, and provide students with a basic understanding of major business issues in the energy industry, including historical and current events. Emphasis will be on oil and gas, but may also touch on other energy subsets such as utilities. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 870 COMPETITIVE STRATEGY (1.5)**

Systematic examination of models and techniques used to analyze a competitive situation within an industry from a strategic perspective. Examines the role of key players in competitive situations and the fundamentals of analytical and fact oriented strategic reasoning. Examples of applied competitive and industry analysis are emphasized. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Cording.

**MGMT 871 STRATEGY FORMULATION AND IMPLEMENTATION (1.5)**

This course focuses on formulating and implementing effective organizational strategy, including competitive positioning, core competencies and competitive advantage, cooperative arrangements, and tools for implementation. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 874 OPERATIONS MANAGEMENT (1.5)**

Introduction to the design and improvement of operations, including manufacturing technologies, quality management and control, and organizational issues in operations. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 880 MARKETING (3)**

Introduction to the key concepts underlying the function of marketing in a business enterprise. Includes lectures and an extensive analysis of marketing management cases. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Westbrook.

**MGMT 882 PRICING STRATEGY AND TACTICS (1.5)**

Course is intended to provide the knowledge required to make successful pricing decisions. Emphasis is on strategies and tactics to set initial prices for a product or service and to react to competitive forces as the product or service goes through the product life cycle. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Robinson.

**MGMT 884 BRAND MANAGEMENT (1.5)**

Application of various dimensions of marketing strategy and management to the role of the product manager responsible for all marketing activities of a given product. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Perkins.

**MGMT 895 DATA ANALYSIS (3)**

The ever-increasing capacity of computers to analyze data, and the explosion of the amount of data available, has resulted in an increased role for data analysis as an aid to business decision-making. This course exposes the student to the most important ideas and method relevant for data analysis in a business context. Emphasizing practical applications to real problems, the course covers the following topics: Sampling, Descriptive Statistics, Probability Distributions, and Regression Analysis. Must be enrolled in one of the following Program(s): MBA Executive Program. Repeatable for Credit. Instructor(s): Batsell.

**MGMT 896 LEADERSHIP COMMUNICATION (1.5)**

This course is an introduction to corporate communication strategy and global communication, with individual and team-based instruction in both written and oral communication. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): O'Sullivan; Hampton.

**MGMT 897 LEADERSHIP COMMUNICATIONS II (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): O'Sullivan; Hampton.

**MGMT 901 FINANCIAL STATEMENT ANALYSIS (1.5)**

Study of how investors, financial analysts, creditors, and managers use financial statement information in evaluating firm performance and in valuing firms. Emphasizes industry and firm-level analysis of accounting information using financial accounting concepts and finance theory. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Dharan.

**MGMT 905 HEALTHCARE (2.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Parisi.

**MGMT 907 FINANCIAL REPORTING AND ANALYSIS (1.5)**

This course is designed to increase your ability to extract and interpret information in corporate financial statements. It will focus on developing your skills in accounting analysis, using the disclosures in a firm's annual and quarterly reports to determine accounting policy choices, and assessing how those choices affect the firm's primary financial statements. This course will improve your ability to use an accounting report as part of an overall assessment of the firm's strategy and the potential rewards and risks of dealing with the firm. Must be enrolled in one of the following Program(s): MBA Executive Program. Prerequisite(s): MGMT 901. Limited enrollment.

**MGMT 908 NEGOTIATION AND CONFLICT RESOLUTION II (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Zhou.

**MGMT 909 NEGOTIATION AND CONFLICT RESOLUTION (0)**

Development of analytical and behavioral skills for resolving conflict and negotiating successfully in a business context. Topics include analysis of your negotiation counterpart, adversarial versus cooperative bargaining, influence tactics, and ethics. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Zhou.

**MGMT 911 ORGANIZATIONAL ARCHITECTURE AND COMPETITIVE ADVANTAGE (1.5)**

Study of effective organizational design, with a focus on costs and benefits as well as on increasing performance. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 919 CORPORATE GOVERNANCE (1.5)**

Critical examination of director selection, board decision-making processes, chief executive officer evaluation in compensation, the board's role in strategic planning, the impact of external constituencies of governance, and legal aspects of governance. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Zhang.

**MGMT 925 STRATEGIC ALLIANCES AND JOINT VENTURES (1.5)**

In today's world of global markets, rapid technological advancement, and increasing complexity of new products, few companies can successfully compete alone. As such, for industry giants and ambitious start-ups alike, strategic partnerships have become critical. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.



**MGMT 926 VENTURE CAPITAL (1.5)**

Overview of the venture capital industry, the organization and operation of venture capital funds, investment methodology, monitoring and portfolio liquidation, leveraged investing, and specialized investments. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment. Instructor(s): Murphree.

**MGMT 927 ENTREPRENEURSHIP: ENTERPRISE EXCHANGE (2.5)**

The needs approach to buying and selling businesses. Enterprise valuation, deal and contract structuring. Leveraged buyouts and consolidating fragmented industries. Economics and financing. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Napier.

**MGMT 937 INVESTOR RELATIONS (1.5)**

Students will learn theory and practice of investor relations, with special emphasis on the role of investor relations/financial communication, compliance with SEC regulations, the creation of annual reports, road shows, stock holder meetings, preparing financial statements for the public, and more. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 942 MANAGING GROWTH (1.5)**

The focus of the course will be how to transform a small business into a large business: putting systems and processes in place to create a foundation for growth, driving a transformation both internally and externally, and leading people through that transition. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 947 CORPORATE FINANCE (1.5)**

Capital structure, stockholder distributions, agency issues. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 948 ECONOMIC INCENTIVES AND ORGANIZATIONS (1.5)**

This course deals with incentive conflicts within organizations and how they affect shareholder value. A framework is presented for constructing a productive organizational architecture that assigns design rights to the appropriate employees, evaluates appropriately their efforts, and rewards them based on performance. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 950 FINANCIAL RISK MANAGEMENT (1.5)**

The basics of futures and options, as well as real options and use of derivatives to hedge risk. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Hund.

**MGMT 952 MERGERS AND ACQUISITIONS (1.5)**

Motivation, valuation, and strategy in the process of merging established businesses or evaluating/acquiring other enterprises. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Hackett.

**MGMT 954 FINANCIAL RESTRUCTURING (1.5)**

This course will examine the causes of and the alternatives available to firms that are confronting financial distress. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Atherton.

**MGMT 957 INTERNATIONAL FINANCE (1.5)**

Exploration of issues encountered in international financial arenas, including foreign exchange rate risk management, capital budgeting for international projects, and international financing strategies. Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Watanabe.

**MGMT 958 STRATEGIC ISSUES FOR GLOBAL BUSINESS (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Zhang.

**MGMT 959 STRATEGY AND MANAGING INTERNATIONAL STRATEGIC ALLIANCES (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program. Instructor(s): Zhang.

**MGMT 960 STRATEGIC INNOVATION MANAGEMENT (1.5)**

Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 961 BUSINESS LAW (1.5)**

Contracts, employment law, product liability, and foreign corrupt practices act. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 970 STRATEGY PLANNING AND CREATIVITY (1.5)**

Controlling and evaluating effectiveness. Action planning scenario creation and planning. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 974 OPERATIONS MANAGEMENT--LEAN SIX SIGMA (1.5)**

This course is about making money the old-fashioned way -- by rolling up one's sleeves and fixing the problems that constrain us from making more money. We will use the framework of the latest consulting terminology -- Lean Six Sigma -- to try to understand the interactions of Better, Cheaper and Faster. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MGMT 982 ADVERTISING AND PROMOTION (1.5)**

This course will take an Integrated Marketing Communications approach to the development, implementation, and control for advertising and promotion programs. We will examine the role of IMC in marketing and discuss how to develop, monitor, and evaluate advertising, sales promotion, direct marketing, public relations, and other types of non-traditional marketing communication programs. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 984 MARKETING RESEARCH (1.5)**

The objectives of the course are: to familiarize you with the marketing research process, alternative research designs and data collection techniques; to develop capabilities in designing and executing studies appropriate for a particular marketing problem; and to provide skills for using and understanding various data analysis procedures for survey and experimental data. Must be enrolled in one of the following Program(s): MBA Executive Program.

**MGMT 985 GLOBAL LEADERSHIP (1.5)**

Leadership challenges, skills and strategies in the global context. Cross-cultural differences in characteristics of followership, values, information-processing styles, interpersonal relationships, group dynamics and many other areas. Implications of these differences for employee attitudes and behavior, and for leadership effectiveness in the workplace. Scientifically-proven course material and dynamic, interactive teaching style. Must be enrolled in one of the following Program(s): MBA Executive Program. Limited enrollment.

**MILI (MILITARY SCIENCE)****No College Designated/Military Science****MILI 106 ADVANCED PHYSICAL FITNESS COURSE (1)**

Physically demanding. Develops skills through team competition. Land navigation, assembly/disassembly of weapon, tactics, assembly of one-man rope bridge. Students are also required to attend fitness training 5 times a week. Participants compete for Ranger Challenge slots. Selected cadets compete against other teams at the annual Ranger Challenge competition. Recommended prerequisite(s): Must be ROTC cadet. Repeatable for Credit.

**MILI 109 PHYSICAL FITNESS TRAINING (1)**

Open to all students. Utilizes Army fitness techniques; develops strength, flexibility and endurance; develops self-confidence through leadership training and physical activities. Repeatable for Credit.

**MILI 121 INTRODUCTION TO ROTC (2)**

Learn fundamental concepts of leadership in both classroom and outdoor laboratory environments. Increase self-confidence through team study and activities in basic drill, physical fitness, rappelling, first aid and basic marksmanship. Develop communication skills to improve individual performance and group interaction. One hour classroom session and a required lab. No military commitment is required for attending this course. Offered Fall.

**MILI 122 INTRODUCTION TO LEADERSHIP (2)**

Learn and apply principles of effective leadership. Reinforce self-confidence through participation in physically and mentally challenging training with upper division ROTC students. Develop communications skills to improve individual performance and group interaction. Relate ethical values to the effectiveness of a leader. Includes training on survival skills and self-defense. One hour classroom session and a required lab. No military commitment is required for attending this course. Offered Spring.

**MILI 123 LEADERSHIP LAB (0)****MILI 201 MILITARY LEADERSHIP DEVELOPMENT (2)**

Characteristics of leadership, problem analysis, decision making, oral presentations, first aid, small unit tactics, land navigation, basic radio communication, marksmanship, fitness training, rappelling. Fitness training required two times per week in addition to class and lab. Offered Fall.

**MILI 202 MILITARY LEADERSHIP DEVELOPMENT (2)**

Continuation of MILI 201. Offered Spring.

**MILI 203 LEADERSHIP LABORATORY (0)**

Repeatable for Credit.

**MILI 281 LEADER TRAINING COURSE (LTC) (8)**

Four week off campus field training practicum. Introduces students to the Army and Leadership. No military obligation is associated with this course. Department permission required.

**MILI 301 ADVANCED MILITARY SCIENCE (3)**

Leadership training, preparing combat orders, military instruction principles, small unit tactics, and tactical communications. Course is designed to prepare students for Leader Development Assessment Course (LDAC). In addition to class, students must attend lab and physical fitness training. Department permission required. Offered Fall.

**MILI 302 ADVANCED MILITARY SCIENCE (3)**

Continuation of MILI 301. Offered Spring.

**MILI 304 LEADERSHIP LABORATORY (0)****MILI 349 LEADER DEVELOPMENT ASSESSMENT (4)**

Off campus field training practicum stressing application of leadership management with emphasis on tactical and special military skills. Pre-requisite(s): MILI 302. Department permission required.

**MILI 398 SPECIAL PROBLEMS (3)**

Must be in one of the following Classification(s): Junior. Department permission required.

**MILI 401 ADVANCED MILITARY SCIENCE (3)**

Leadership and command, military law, administrative/staff operations and procedures, dynamics of the military team, training management, ethics and professionalism. In addition to class, students must attend lab and physical fitness training. Department permission required. Offered Fall.

**MILI 402 ADVANCED MILITARY SCIENCE (3)**

Continuation of MILI 401. Offered Spring.

**MILI 403 LEADERSHIP LABORATORY (0)****MILI 439 SPECIAL PROBLEMS (3)**

Must be in one of the following Classification(s): Senior. Department permission required.

**MLSC (LIBERAL STUDIES)****Continuing Studies/School of Continuing Studies****MLSC 501 THE SHAPING OF WESTERN THOUGHT (3)**

This course will focus on readings in literature, philosophy, history, and religion that have been instrumental in shaping Western thought throughout the centuries. Students will study and discuss Homer's Iliad, Euripides' Medea, selections from Thucydides, Plato's Republic, selections from the Hebrew Bible and the New Testament, Virgil's The Aeneid, Augustine's Confessions, and Chaucer's The Canterbury Tales. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Huston.

**MLSC 502 OUR ENVIRONMENT: SCIENCE AND CULTURE (3)**

In this course, students will learn environmental concepts, the science and culture behind them, and possible reactions to related problems from a political, economic, and cultural perspective. The instructor will introduce the necessary background material in biology, ecology, and chemistry as needed but the emphasis will be on obtaining scientific literacy in environmental studies. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Sass.

**MLSC 503 VIOLENCE AND HUMAN NATURE (3)**

The topic of violence has engaged social scientists from many fields and can provide an illuminating and interesting focus for understanding the research and rationale of psychologists, political scientists, anthropologists, and sociologists. Topics covered in this course include the early concepts of human behavior, evolutionary, biological, cross cultural, and historic approaches, cultural factors and the mass media, the sociology of violence, Freud and other emotion theorists, group violence, and legal, political and psychological solutions to controlling violence. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Schneider.

**MLSC 504 ISLAM: STATE AND SOCIETY (3)**

This course offers an analytical and theoretical examination of government and social systems in the Arab and Muslim world. Because no one discipline is sufficient for an adequate understanding, this course reaches across the disciplines to include various subjects. History, economics, political science, gender studies, as well as literary and cinematic are the venues for learning about the region. The course will maximize student participation and students will be expected to be fully engaged through class discussion, oral presentations and writing assignments. Limited enrollment. Instructor(s): Al-Sowayel.

**MLSC 505 SHAKESPEARE AND FILM (3)**

This course will examine several Shakespeare plays and their theatrical productions. The instructor will teach each play as a text (and a script) first, and then study the films of these plays in an effort to understand the choices the film-makers have made in adapting Shakespeare's plays to the screen. In this course, then, we will be concerned with studying both Shakespeare's plays and what happens to those plays in the hands of a creative film-maker. Limited enrollment. Instructor(s): Huston.

**MLSC 506 THE SOLAR SYSTEM AND THE MIND OF MAN (3)**

This course will explore the beauty of the solar system, both as majestic work of nature and from the standpoint of a challenge to the observational and analytical capabilities of human beings. We will review our knowledge of the solar system from Ptolemy to the present day using contributions of Copernicus, Kepler, Galileo, Newton, Einstein, and finally, robotic spacecraft. We will examine each planet and its satellite(s) using its satellite(s) using data and photographs from space probes and the Apollo missions. We will study the earth's atmosphere including present-day changes such as global warming. Finally, we will review briefly how the solar system came into being, the contemporary search for planets around other stars, and the probability of extraterrestrial life and intelligence. The course will be non-mathematical. Limited enrollment. Instructor(s): Freeman.

**MLSC 507 THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS (3)**  
 There are a series of interrelated themes in this course. We want to study and discuss ideas that can be relevant to a number of disciplines in the social sciences. We want to use these ideas to explore some interesting questions that are asked in the social sciences. But just because an idea is interesting does not mean it is valid. So we also want to think about how we might determine if these ideas actually account for behavior in the real world (i.e., how would we test these ideas and insights?). Limited enrollment. URL: [www.ruf.rice.edu/~stoll/mlsc507/](http://www.ruf.rice.edu/~stoll/mlsc507/). Instructor(s): Stoll.

**MLSC 508 EARTH SYSTEMS DYNAMICS (3)**  
 This course involves exposing the advanced student to the interactions among the several mechanisms that combine to produce a working Earth. It would include concepts of Physics, Chemistry, Biology, Geology, Meteorology and Ecology. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Sass.

**MLSC 509 STEREOTYPES, PREJUDICE, AND DISCRIMINATION (3)**  
 In the past century, social scientists have learned an enormous amount about stereotypes, prejudice, and discrimination, yet they remain poorly understood by the public at large and especially by public policy makers. We all have hold stereotypes, show prejudices, and discriminate although not necessarily in traditional racist or sexist ways. This course will explore what social scientists, especially social psychologists, have learned about these issues especially in the last quarter century. While we will cover traditional racial and gender issues, we will also consider material related to obesity, homosexuality, mental and physical disability, and age among other topics. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Schneider.

**MLSC 510 MUSIC AND OTHER ARTS: COLLABORATION AND FUSION (3)**  
 This course will introduce students to the collaboration between music and other arts - poetry, drama, mythology, the visual arts (as applied to set and costume design), and dance - that often occurs during the creation of large musical works such as symphonies, operas, and ballets. By investigating six musical masterpieces, it will be possible to discuss aspects of the collaborative process and how they lead to artistic fusion. Department permission required. Limited enrollment.

**MLSC 601 INTRODUCTION TO WESTERN ART: CAVES TO CATHEDRALS (3)**  
 This course will introduce students to major art historical periods and monuments of the western world from the first appearance of images in the caves of Paleolithic Europe to the construction of Medieval cathedrals and the illumination of books of hours in the fifteenth century. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Neagley.

**MLSC 602 AGAINST THE GRAIN: DISSENTERS IN AMERICAN SOCIETY (3)**  
 This course will offer a biographical focus on ten Americans who challenged the orthodoxies of their time and place. Where these radical dissenters visionaries or cranks? What led them to challenge the conventional wisdom of their day? Which of their ideas came to fruition, and which ones were rejected? By examining unpopular ideas and the man and women who propounded them, perhaps we can understand the dynamics of social change. Must be enrolled in one of the following Major(s): Liberal Studies. Limited enrollment. Instructor(s): Lichtenstein.

**MLSC 603 HOW COME COMMUNISM COLLAPSED? (3)**  
 This history course will investigate the collapse of communism in Eastern Europe in 1989 and 1991 and related historical issues. Why did Marxism, which is based on a critique of capitalism, succeed in Russia in the first place, since Russia was essentially an agrarian state? What led to the emergence of the Cold War after World War II? Was it the Yalta agreements, aggression by the Soviet Union, American intransigence, or what? When did the Soviet system sign its own death warrant? Who was the prime mover in the events of 1989 - Ronald Reagan, Mikhail Gorbachev, or the East Europeans themselves? And what about Yugoslavia? Why did the collapse of communism there mean bloody warfare, whereas it did not in the USSR and in Czechoslovakia? Department permission required. Limited enrollment.

**MLSC 604 EXPLORATION AND DISCOVERY IN ANTARCTICA (3)**  
 This course will introduce students to the seventh continent through the history of austral exploration and through an explanation of the scientific research that has happened, is happening, and will happen there. This course will begin with a basic scientific description of the highest, driest, coldest, windiest continent on Earth. Participants will then study journals of some of the original explorers as well as recent works analyzing the "glory days" of polar exploration. The class will then move from the period of exploration, through the early scientific work, and on to the modern hypothesis-driven science that is taking place now and is being planned for the future, particularly that for the International Polar Year scheduled for March 2007 to February 2009. The class will close with an examination of tourism and its effects on the nature of the Antarctic ecosystems and cryosphere. Department permission required. Limited enrollment.

**MLSC 605 TRANSNATIONAL CHINA: THE MIDDLE KINGDOM IN GLOBAL PERSPECTIVE (3)**

Almost everyone in the contemporary world is aware that the 21st century may well be "China's century." This course will focus on the ways that geography, history and the forces of "globalization" have shaped the politics, social life, and culture of East Asia. Although the focus of this course will be primarily on China, we will give some attention to other parts of East Asia, including pre-modern and contemporary Korea, Japan and Vietnam. Department permission required. Limited enrollment.

**MLSC 606 THE HEBREW BIBLE AND ITS INTERPRETERS (3)**

This seminar seeks to acquaint students with the principal parts of the Hebrew Bible/Old Testament, with the modern, historical-critical study of the Bible as an academic discipline, and a few episodes in the reception history of the Bible in the West. Our reading of the biblical literature will primarily be historical-critical in the sense that it emphasizes that the Hebrew Bible is rooted in the ancient Near East, its history and literature. At the same time we will be sensitive to traditional, Jewish and Christian readings of the Bible as they evolved over two millennia and examine how these faith-based traditions arose, how they differ from modern critical approaches, and how the two can complement each other. Department permission required. Limited enrollment.

**MLSC 607 MEDICAL ANTHROPOLOGY (3)**

This course examines how the body, health, illness and healing have been conceptualized across different cultures and different historical periods. This course also explores the complex interrelationship between biology and culture, and discusses how historical, political and cultural factors have helped shape our biology to produce specific distributions of health and disease. Department permission required. Limited enrollment.

**MLSC 700 CAPSTONE (3)**

Departmental permission required. To be completed after all MLS core and elective courses have been successfully completed. Offered fall, winter, and spring terms only. Department permission required.

**MSCI (MATERIALS SCIENCE)****School of Engineering/Mechanical Engineering & Materials Science****MSCI 301 MATERIALS SCIENCE (3)**

Introduction to the science of solid materials. Includes metals, ceramics, plastics, and semiconductors, as well as the properties of solid materials from atomic and macroscopic points of view. Required for mechanical engineering and materials science and engineering majors. Offered Fall & Spring. Instructor(s): Brotzen; Loos.

**MSCI 303 MATERIALS SCIENCE JUNIOR LAB (1)**

Selected lab experiments in materials science. Open only to junior materials science and engineering majors. Required for materials science and engineering majors. At the start of the semester, please check with the Department of Mechanical Engineering and Materials Science for the time and location of the organizational meeting for the course. Offered Spring.

**MSCI 304 APPLIED MATERIALS ENGINEERING (1)**

Practical application of the basic principles of materials science. Includes case studies of failures under a variety of conditions, as well as topics in the fabrication and heat treatment of metallic materials. Instructor(s): Cunningham.

**MSCI 311 INTRODUCTION TO DESIGN (4)**

Introduction of fundamental aspects of design through semester-long group projects. Open to non-majors only with permission of instructor. Required for materials science and engineering majors. Offered Fall. Instructor(s): Barrera.

**MSCI 401 THERMODYNAMICS AND TRANSPORT PHENOMENA IN MATERIALS SCIENCE (4)**

Unified presentation of the kinetics and thermodynamics of mass and energy transport. Includes heterogeneous equilibrium, diffusion in solids, and heat transfer, as well as their application to engineering design. Required for materials science and engineering majors. Offered Fall. Instructor(s): McLellan.

**MSCI 402 MECH PROPERTIES OF MATERIALS (3)**

Survey of the mechanical properties of solid materials. Includes basic mechanics, elasticity, plasticity, fracture, fatigue, creep, hardening mechanisms, mechanical testing, and structure-property relationships. Required for materials science and engineering majors. Pre-requisite(s): MATH 211. Offered Fall. Instructor(s): Lou.

**MSCI 404 MATERIALS ENGINEERING AND DESIGN (4)**

Exploration of technological aspects of materials selection, design, failure, and analysis. Lab time spent in an industrial setting. Open to non-majors only with permission of instructor. Required for materials science and engineering majors. Offered Spring. Instructor(s): Cunningham.

**MSCI 406 PHYSICAL PROPERTIES OF SOLIDS (3)**

Survey of the electrical, magnetic, and optical properties of metals, semiconductors, and dielectrics based upon elementary band theory concepts. Required for materials science and engineering majors. Not offered every year. Pre-requisite(s): MATH 211. Offered Fall. URL: [www.ownet.rice.edu/~msci406](http://www.ownet.rice.edu/~msci406). Instructor(s): Yakobson.

**MSCI 411 METALLOGRAPHY AND PHASE RELATIONS (3)**

Study of microstructures that may be observed in metals and alloys, optical metallography (in addition to more sophisticated techniques), and the relationships between structural properties and failures. Required for materials science and engineering majors. Pre-requisite(s): MSCI 301. Offered Spring. Instructor(s): McLellan.

**MSCI 415 CERAMICS AND GLASSES (3)**

Fundamentals of ceramic and glassy materials, including phase relations, theoretical properties, structure, bonding, and design.

**MSCI 500 MATERIALS SCIENCE SEMINAR (0)**

A series of seminars on selected topics in Materials Science. Required for materials science and engineering majors. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Barrera.

**MSCI 501 MATERIALS SCIENCE SEMINAR (1)**

See MSCI 500. Required for materials science and engineering majors. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Barrera.

**MSCI 510 COMPUTATIONAL NANOMECHANICS (3)**

Fundamentals of mechanical properties in nanometer scale. Role of discrete structure, underlying atomic, molecular and interfacial forces is illustrated with modern examples. Includes overview of computational modeling methods with the emphasis on multi-scale physics. Accessible for senior undergraduates. Instructor permission required. Instructor(s): Yakobson.

**MSCI 523 PROPERTIES, SYNTHESIS AND DESIGN OF COMPOSITE MATERIALS (3)**

Study of the science of interfaces and the properties that govern their use in composite materials. Not offered every year. Offered Spring. Instructor(s): Barrera.

**MSCI 535 CRYSTALLOGRAPHY AND DIFFRACTION (3)**

Study of crystals by x-ray, electron and neutron diffraction. Includes basic diffraction theory as well as methods for characterizing the structure, composition and stresses in crystalline materials. Required for undergraduate materials science and engineering majors. Cross-listed with PHYS 535. Offered Fall. URL: [www.owl.net.rice.edu/~msci535](http://www.owl.net.rice.edu/~msci535). Instructor(s): Loos.

**MSCI 537 CRYSTALLOGRAPHY AND DIFFRACTION LAB (1)**

Selected lab experiments in materials science. Required for undergraduate materials science and engineering majors. Offered Fall. Instructor(s): Loos.

**MSCI 545 THIN FILMS (3)**

Deposition methods, structure, properties, performance and failure mechanisms of thin solid films for various applications. Deposition methods include sputtering, plating, evaporation and chemical vapor deposition. Material types include crystalline and amorphous metals as well as semiconductors and insulators. Applications are primarily in microelectronics; data storage; micro-electro-mechanical systems, wear and corrosion prevention and thermal barriers. Cross-listed with ELEC 545. URL: [www.owl.net.rice.edu/~msci545](http://www.owl.net.rice.edu/~msci545). Instructor(s): Loos.

**MSCI 561 ADVANCED METALLURGICAL LAB I (1)**

Students whose interest lies primarily in the field of materials and metallurgy are given the opportunity for research in these fields. Instructor permission required. Offered Fall.

**MSCI 569 CORROSION SCIENCE AND ENGINEERING (3)**

Survey of surface activity and corrosion processes on metals, semiconductors, and insulating materials. Survey of the principles and theories of corrosion, corrosion testing, and the selection of materials for corrosion prevention. Not offered every year. Pre-requisite(s): MSCI 301. Offered Spring.

**MSCI 570 SENIOR DESIGN THESIS PROJECT (2)**

A design project in the materials science field will be undertaken by the student in close collaboration with at least one materials science faculty member. Offered Fall.

**MSCI 571 SENIOR DESIGN THESIS PROJECT (2)**

A design project in the materials science field will be undertaken by the student in close collaboration with at least one materials science faculty member. Offered Spring.

**MSCI 580 MICROSCOPY METHODS IN MATERIALS SCIENCE (3)**

This course focuses on theories, applications, and sample preparation for various microscopy methods including Atom Force Microscopy (AFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and related spectroscopy techniques. Hands on experience is emphasized. Students are expected to be able to independently operate related instruments after taking the course. Prerequisite(s): MSCI 535. Offered Spring. Instructor(s): Lou; Loos.

**MSCI 593 POLYMER SCIENCE AND ENGINEERING (3)**

Basic concepts in macromolecular chemistry and their application in the synthesis and chemical modification of polymers. Pre-requisite(s): CHEM 211 and CHEM 212. Offered Fall. Instructor(s): Armeniades.

**MSCI 594 PROPERTIES OF POLYMERS (3)**

Study of the molecular organization and physical properties of polymeric materials. Includes elastomeric, semi-crystalline, and glassy polymers, as well as the processing and technology of polymeric systems. Required for materials science and engineering majors. Offered Spring. Instructor(s): Armeniades.

**MSCI 596 CHEMISTRY OF ELECTRONIC MATERIALS (3)**

A review of the chemical processes involved in the manufacture of microelectronic chips, including: crystallization, purification, oxidation, thin film methods, lithography and ceramic processing. Usually alternates with CHEM 595. Open to undergraduates by special permission only. Cross-listed with CHEM 596. Offered Fall & Spring. Instructor(s): Barron.

**MSCI 597 POLYMER SYNTHESIS, SOFT MATERIALS AND NANOCOMPOSITES (3)**

The course will cover methods of characterization and some basic synthetic polymer methods (step growth and chain growth approaches). New synthetic polymer methods will be presented including ATRP, ADMET, ROMP, metallocene catalysts and the development of flame retardant polymer blends. Carbon-carbon composites will be discussed, along with the functionalization of carbon nanotubes and their use in nanocomposites. Cross-listed with CHBE 597, CHEM 597. Repeatable for Credit. Offered Spring. Instructor(s): Tour; Barrera.

**MSCI 603 TECHNOLOGY MANAGEMENT FOR SCIENTISTS AND ENGINEERS (3)**

This course is intended for graduate students in science and engineering who are interested in gaining an understanding of the business of technology. Particular emphasis is placed on the financial and human resources management, business strategy, patents, trademarks, and licenses, as well as new business start-up and development. Cross-listed with CHEM 603. Instructor(s): Barron.

**MSCI 609 FRACTURE MECHANICS (3)**

Topics on the theory of linear and nonlinear fracture mechanics. Energetics of fracture, the J-integral, stress and strain fields near crack tips, R-curve behavior. Cross-listed with MECH 518. Offered Spring.

**MSCI 610 CRYSTAL THERMODYNAMICS (3)**

Discussion of potentials and third-order elastic constants. Includes the lattice dynamics of harmonic phonons and anharmonic perturbation expansion, as well as the contribution of electrons to the thermodynamics quantities. Not offered every year. Offered Fall. Instructor(s): Yakobson.

**MSCI 611 INDEPENDENT STUDY (1 TO 9)**

Offered Fall. Instructor(s): Yakobson.

**MSCI 612 INDEPENDENT STUDY (1 TO 9)**

Offered Spring.

**MSCI 614 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MSCI 615 SPECIAL TOPICS (1 TO 9)**

Topics may vary. Please consult with the department for additional information. Offered Fall & Spring.

**MSCI 616 AUTOMOTIVE ENGINEERING: MATERIALS AND DYNAMICS (1 TO 3)**

Discussion of the engineering and materials technology that is involved in modern automotive design. Topics include: chassis design and construction; composite design and fabrication; aerodynamics and ground effects; suspension dynamics; performance technology. External expert speakers will provide a real-world perspective. Course will only be offered with sufficient demand. Check with the instructor. Repeatable for Credit. Offered Fall. Instructor(s): Barron.

**MSCI 621 M.M.S. RESEARCH PROJECT I (3)**

This is the first part of the M.M.E. research project course. The faculty advisor, taking into account the background and research interests of the student as well as the research interests of the faculty advisor, will determine the contents. Course requirements will include a final report. Offered Fall & Spring.

**MSCI 622 M.M.S. RESEARCH PROJECT II (3)**

This is the second part of the M.M.E. research project and continuation of MECH 621. Course requirements will include a final report. Offered Fall & Spring.

**MSCI 623 ANALYTICAL SPECTROSCOPES: TOOLS IN MATERIALS SCIENCE (3)**

Exploration of concepts in vacuum technology, thin film metallization, x-ray photoelectron spectroscopy, Auger electron spectroscopy, and x-ray absorption fine structure. Includes lab sessions on XPS and EXAFS analysis. Not offered every year. Pre-requisite(s): MSCI 402 and MSCI 535. Offered Fall.

**MSCI 634 THERMODYNAMICS OF ALLOYS (3)**

Examinations of relations between classical thermodynamics and statistical mechanics as applied to an understanding of solid and liquid alloys. Includes solid-solid, liquid-solid, and gas-solid equilibria in metallurgy. Not offered every year. Offered Fall. Instructor(s): McLellan.

**MSCI 635 TRANSFORMATION IN ALLOYS (3)**

Study of diffusion in metals and alloys. Includes the mechanism and phenomenology of diffusion-controlled transformations, precipitation from saturated alloys and liquid solutions, and transformations in heat-treated alloys. Not offered every year. Offered Spring. Instructor(s): McLellan.

**MSCI 666 CONDUCTION PHENOMENA IN SOLIDS (3)**

Survey of fundamental aspects of electron and energy transport in conductors, semiconductors, and insulators. Not offered every year. Pre-requisite(s): MSCI 406. Recommended prerequisite(s): MSCI 406 or equivalent. Offered Spring. Instructor(s): Brotzen.

**MUSI (MUSIC)****School of Music/Music****MUSI 111 MUSICAL LIVES (3)**

Musical biography tends to follow stereotypical patterns that depict composers as heroes who rebel against authority and live on the margins of society. This seminar will focus on the life stories and music of selected 18th and 19th century composers. No musical background necessary. Cross-listed with FSEM 111. Limited enrollment. Not offered this academic year. Instructor(s): Ferris.

**MUSI 112 GREAT LITERATURE IN GREAT MUSIC (3)**

A study of six famous literary works, from classical civilization to expressionism, and their incarnation in famous musical compositions. Authors include Vergil, Shakespeare, Beaumarchais, Pushkin, Goethe, and Buchner; paired pieces include operas by Berlioz, Verdi, Mozart, Tchaikovsky, Gounod, and Berg. No technical or reading knowledge of music is required. Cross-listed with FSEM 112. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Spring. Instructor(s): Citron.

**MUSI 117 FUNDAMENTALS OF MUSIC I (3)**

For non-music majors with minimal music preparation. Rudiments of pitch and duration. Study of scales, chord structure, tonality, and forms. Limited enrollment. Offered Fall & Spring.

**MUSI 141 CLASSICAL GUITAR/NON-MAJOR (2)**

Private instruction on guitar. Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Gaschen.

**MUSI 151 FLUTE FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 153 OBOE FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 155 CLARINET FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 157 BASSOON FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 161 HORN FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 163 TRUMPET FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 165 TROMBONE FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 167 TUBA FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 171 PERCUSSION FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.



**MUSI 173 VOICE FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Dunn.

**MUSI 181 PIANO FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Limited enrollment. Offered Fall & Spring.

**MUSI 183 ORGAN FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 187 HARP FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 191 VIOLIN FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 193 VIOLA FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 195 VIOLONCELLO FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 197 DOUBLE BASS FOR NON-MAJORS (2)**

Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 211 THEORY I (3)**

Intensive study of the fundamentals of pitch, rhythm, and timbre. Must be enrolled in one of the following Major(s): Music. Offered Fall. Instructor(s): Lavenda.

**MUSI 212 THEORY II (3)**

Harmony and counterpoint of the Baroque and Classical Eras. Must be enrolled in one of the following Major(s): Music. Offered Spring. Instructor(s): Brandt

**MUSI 222 MEDIEVAL AND RENAISSANCE ERAS (3)**

Introduction to the study of Western music history, with emphasis on music before 1600. Score reading ability required. Cross-listed with MDST 222. Pre-requisite(s): MUSI 211 or MUSI 317 or permission of instructor. Offered Spring. Instructor(s): Loewen

**MUSI 230 GREEK AND ROMAN SOURCES IN THE HISTORY OF OPERA (3)**

The aim of the course is to develop critical skills and new ideas about classical antiquity and western music of the last four centuries, with special reference to musical drama. This course takes a literary-historical approach to what has come to be known as opera. Among the major themes we will discuss are the complex admixture of factors which produced the earliest operas, the persistent influence of Ovid, the appeal of mythic Crete, Greek & Roman history, the centrality of pastoral poetry in the history of the genre, and recurrent efforts through musical-literary history since 1600 to 'reform' and correct 'abuses' in compositional style in poetry and music. Cross-listed with CLAS 230. Offered Spring. Instructor(s): Anderson.

**MUSI 231 AURAL SKILLS AND PERFORMANCE TECHNIQUE I (2)**

Preliminary studies in ear-training, sight-singing, and dictation. Offered Fall. Instructor(s): Jalbert

**MUSI 232 AURAL SKILLS AND PERFORMANCE TECHNIQUE II (2)**

Continuation of MUSI 231. Offered Spring. Instructor(s): Jalbert

**MUSI 236 MUSIC HISTORY THROUGH TECHNOLOGY (3)**

An exploration of music history and literature taught electronically. May not be enrolled in any of the following Major(s): Music. Limited enrollment. Offered Spring. Instructor(s): Gottschalk.

**MUSI 251 SECONDARY FLUTE (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 253 SECONDARY OBOE (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 255 SECONDARY CLARINET (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 257 SECONDARY BASSOON (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 261 SECONDARY HORN (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 263 SECONDARY TRUMPET (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 265 SECONDARY TROMBONE (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 267 SECONDARY TUBA (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 271 SECONDARY PERCUSSION (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 273 SECONDARY VOICE (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunn.

**MUSI 281 SECONDARY PIANO (2)**

Fall offerings: Level 1 offered MWF 12:00-12:50, TR 9:25-10:40. Level 3 offered MWF 8:00-8:50, MWF 10:00-10:50, TR 8-9:15. Spring offerings: Level 2 offered MWF 1-1:50, TR 9:25-10:40. Level 4 offered MWF 8-8:50, MWF 10-10:50, TR 8:00-9:15. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Park.

**MUSI 283 SECONDARY ORGAN (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 285 SECONDARY HARPSICHORD (2)**

Department permission required. Repeatable for Credit. Not offered this academic year.

**MUSI 287 SECONDARY HARP (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 291 SECONDARY VIOLIN (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 293 SECONDARY VIOLA (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 295 SECONDARY VIOLONCELLO (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 297 SECONDARY DOUBLE BASS (2)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 303 UNDERGRAD COMPOSITION SEMINAR (1)**

Must be enrolled in one of the following Major(s): Music. Repeatable for Credit. Offered Fall & Spring.

**MUSI 305 COMPOSITION ELECTIVE (3)**

Must be enrolled in one of the following Major(s): Music. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 307 COMPOSITION FOR NON-MAJORS (3)**

Creative composition employing 20th and 21st century vocabularies. May not be enrolled in any of the following Major(s): Music. Repeatable for Credit. Limited enrollment. Offered Fall & Spring.

**MUSI 311 THEORETICAL STUDIES III (3)**

An examination of music from the Classical Era through the late Nineteenth Century, with particular focus on phrase structure, form and chromatic harmony. Offered Fall. Instructor(s): Chen

**MUSI 312 THEORETICAL STUDIES IV (3)**

Analysis of selected works composed since 1900 Offered Spring. Instructor(s): Brandt.

**MUSI 317 THEORY FOR NON-MAJORS I (3)**

Study of harmony, melody, rhythm, and form. May not be enrolled in any of the following Major(s): Music. Limited enrollment. Offered Fall.

**MUSI 318 THEORY FOR NON-MAJORS II (3)**

Continuation of MUSI 317. May not be enrolled in any of the following Major(s): Music. Pre-requisite(s): MUSI 317. Limited enrollment. Offered Spring.

**MUSI 321 BAROQUE AND EARLY CLASSICAL ERAS (3)**

Advanced historical studies in music of the seventeenth and eighteenth centuries. Score reading ability required. Pre-requisite(s): (MUSI 212 or MUSI 317) and MUSI 222 or permission of instructor. Offered Fall. Instructor(s): Barnett.

**MUSI 322 CLASSICAL AND ROMANTIC ERAS (3)**

Advanced historical studies in the music of the eighteenth and nineteenth centuries. Score reading ability required. Pre-requisite(s): MUSI 321 or permission of instructor. Offered Spring. Instructor(s): Ferris.

**MUSI 324 OPERA ON FILM (3)**

Study of major treatments of cinematic and televised versions of opera, with a focus on aesthetics, interpretation, and representation. Limited enrollment. Offered Fall. Instructor(s): Citron.

**MUSI 327 MUSIC LITERATURE FOR NON-MAJORS I (3)**

Historical survey of music from the Middle Ages to 1750. Not offered this academic year. Instructor(s): Loewen

**MUSI 328 MUSIC LITERATURE FOR NON-MAJORS II (3)**

Historical survey of music from 1750 to the present. Limited enrollment. Not offered this academic year. Instructor(s): Bailey.

**MUSI 329 SPECIAL STUDIES IN MUSIC HISTORY (3)**

Special studies in music history. Topics may vary. Please consult with the department for additional information. Repeatable for Credit. Not offered this academic year.

**MUSI 331 AURAL SKILLS AND PERFORMANCE TECHNIQUES III (2)**

Continuation of MUSI 232. Offered Fall. Instructor(s): Chen.

**MUSI 332 AURAL SKILLS AND PERFORMANCE TECHNIQUES IV (2)**

Continuation of MUSI 331. Offered Spring. Instructor(s): Chen.

**MUSI 334 CAMPANILE ORCHESTRA (1)**

Registration is by audition only. Repeatable for Credit. Offered Fall & Spring.

**MUSI 335 UNDERGRADUATE CHORUS (1)**

Section 1, Shepherd Singers (by audition only); Section 2, Rice Chorale; Section 3, Sallyport. Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Jaber.

**MUSI 337 UNDERGRADUATE ORCHESTRA (2)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rachleff.

**MUSI 338 CHAMBER MUSIC (1)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring.

**MUSI 340 CONCERT BAND (1)**

Section 1: SYMPHONIC BAND; Section 2: CHAMBER MUSIC FOR NON-MAJORS. \*\*\*Course meets in HICKS B-16\*\*\* Repeatable for Credit. Offered Fall & Spring. Instructor(s): Throckmorton.

**MUSI 341 JUNIOR RECITAL (0)**

Department permission required. Offered Fall & Spring.

**MUSI 342 JAZZ ENSEMBLE (1)**

Section 1, Jazz Ensemble I; Section 2, Jazz Ensemble II. \*\*\*Course meets in HICKS B-16\*\*\* Repeatable for Credit. Offered Fall & Spring. Instructor(s): Slezak.

**MUSI 343 PROFESSIONAL DEVELOPMENT FOR MUSICIANS (2)**

This course will explore the practical aspects of building and sustaining a career in music. Using networking, self-promotion, and presentation skills, students will create projects needed for pursuing their careers. Guest speakers will offer additional resources for students as they learn how to navigate the world of the Music Business. Must be in one of the following Classification(s): Graduate, Junior, Senior. Offered Spring. Instructor(s): Rarick.

**MUSI 344 ACTING FOR SINGERS (1)****MUSI 345 APPLIED STUDIES IN JAZZ (2)**

Private lessons on specific advanced techniques in jazz improvisation. Must register with the Shepherd School and the Registrar's Office by the second week of classes. Department permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Slezak.

**MUSI 351 CONCENTRATION FLUTE (2)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 352 CONCENTRATION FLUTE INTENSIVE (3)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Buyse.

**MUSI 353 CONCENTRATION OBOE (2)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 354 CONCENTRATION OBOE INTENSIVE (3)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Atherholt.

**MUSI 355 CONCENTRATION CLARINET (2)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 356 CONCENTRATION CLARINET INTENSIVE (3)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Webster.

**MUSI 357 CONCENTRATION BASSOON (2)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

- MUSI 358 CONCENTRATION BASSOON INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kamins.
- MUSI 361 CONCENTRATION HORN (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 362 CONCENTRATION HORN INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): VerMeulen.
- MUSI 363 CONCENTRATION TRUMPET (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 364 CONCENTRATION TRUMPET INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Speziale.
- MUSI 365 CONCENTRATION TROMBONE (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 366 CONCENTRATION TROMBONE INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Waters.
- MUSI 367 CONCENTRATION TUBA (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 368 CONCENTRATION TUBA INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kirk.
- MUSI 371 CONCENTRATION PERCUSSION (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 372 CONCENTRATION PERCUSSION INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Brown.
- MUSI 373 CONCENTRATION VOICE (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 374 CONCENTRATION VOICE INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kaun; King; Mentzer.
- MUSI 381 CONCENTRATION PIANO (2)**  
Department permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 382 CONCENTRATION PIANO INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Fischer; Shank.
- MUSI 383 CONCENTRATION ORGAN (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 384 CONCENTRATION ORGAN INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Holloway.
- MUSI 387 CONCENTRATION HARP (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 388 CONCENTRATION HARP INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Page.
- MUSI 389 COLLABORATIVE PIANO SKILLS (1 TO 2)**  
A practicum exploring the pianist as an ensemble player. 3 sessions weekly. Performance class for pianists in partnership with instrumentalists and singers-particular techniques discovered in balance, pedaling, articulation, style, etc.; Supervised sight-reading private appointment with instructor on individual repertoire-songs, sonatas, concerto reductions, etc. Repeatable for Credit. Offered Spring. Instructor(s): Fischer.
- MUSI 391 CONCENTRATION VIOLIN (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 392 CONCENTRATION VIOLIN INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Goldsmith; Luca; Winkler.
- MUSI 393 CONCENTRATION VIOLA (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 394 CONCENTRATION VIOLA INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunham.
- MUSI 395 CONCENTRATION VIOLONCELLO (2)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- MUSI 396 CONCENTRATION VIOLONCELLO INTENSIVE (3)**  
Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Fischer; Harrell.

**MUSI 397 CONCENTRATION DOUBLE BASS (2)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 398 CONCENTRATION DOUBLE BASS INTENSIVE (3)**

Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Ellison; Pitts.

**MUSI 401 COMPOSITION FOR MAJORS (3)**

Must be enrolled in one of the following Major(s): Music. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Al-Zand; Brandt; Chen; Gottschalk; Jalbert; Lavenda; Stallmann.

**MUSI 403 BASIC ELECTRONIC MUSIC (3)**

Introduction to electronic and computer music. Limited enrollment. Offered Fall. Instructor(s): Stallmann.

**MUSI 404 ELECTRONIC MUSIC COMPOSITION (3)**

Continuation of MUSI 403. Pre-requisite(s): MUSI 403 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Stallmann.

**MUSI 405 MUSIC BUSINESS AND LAW (3)**

Limited enrollment. Offered Spring. Instructor(s): Gottschalk.

**MUSI 406 CLASSICAL CONCERTO PERFORMANCE CLASS (1)**

Study of concerto repertoire for a chosen instrument with emphasis on stylistically informed performance. Instructor permission required. Repeatable for Credit. Limited enrollment. Not offered this academic year. Instructor(s): Luca.

**MUSI 407 CHAMBER MUSIC IN THE CLASSIC PERIOD (3)**

Performance styles and rhetoric are examined and directed toward performance approaches to the music of Haydn, Mozart, and early Beethoven, and others. Practical application of dances, textures, and popular topics of the time as well as an understanding of harmonic and formal implications. String quartet majors only - other music majors may audit. Not offered this academic year. Instructor(s): Goldsmith.

**MUSI 408 UNACCOMPANIED BACH PERFORMANCE CLASS (1)**

Performance with commentary about stylistic and historic aspects of the works for one unaccompanied instrument of J. S. Bach. Students will perform versions in original form or transcribed for their instrument when applicable. Instructor permission required. Repeatable for Credit. Not offered this academic year. Instructor(s): Luca.

**MUSI 409 SEMINAR IN CLASSICAL PERFORMANCE STYLE (1)**

Haydn, Mozart, early Beethoven, CPE Bach and other repertoire of the period. You must belong to a group that has already been coached and is prepared to perform at least one movement. Instructor permission required. Not offered this academic year. Instructor(s): Luca.

**MUSI 414 PIANO CHAMBER MUSIC LITERATURE (3)**

Survey of the classical era with a focus on 20th and 21st century chamber music with piano. Not offered this academic year. Instructor(s): Connolly.

**MUSI 415 BAND ARRANGING (1)**

Creative band arranging for marching, jazz, and concert bands. Study of contemporary harmony, musical style, and scoring supported by practical performance and analysis of student projects. Instructor(s): Throckmorton.

**MUSI 416 ORCHESTRATION (3)**

Intensive study of the individual instruments of the orchestra and orchestrational techniques from the classical period through the present. Limited enrollment. Offered Fall. Instructor(s): Jalbert.

**MUSI 417 MUSIC FOR FILM (3)**

Not offered this academic year. Instructor(s): Gottschalk.

**MUSI 421 THE MODERN ERA (3)**

Advanced historical studies in music of the twentieth and twenty-first centuries. Score reading ability required. Pre-requisite(s): MUSI 322 or permission of instructor. Offered Fall. Instructor(s): Bailey.

**MUSI 422 RENAISSANCE MUSIC (3)**

A study of the major musical styles and composers of Western art and music between 1400 and 1600 and their historical, cultural, and sociological contexts. Limited enrollment. Not offered this academic year. Instructor(s): Loewen.

**MUSI 424 ORGAN LITERATURE I (3)**

Not offered this academic year. Instructor(s): Holloway.

**MUSI 425 ORGAN LITERATURE II (3)**

Not offered this academic year. Instructor(s): Holloway.

**MUSI 426 PIANO LITERATURE - SURVEY (3)**

Offered Fall. Instructor(s): Fischer.

**MUSI 427 ORGAN LITERATURE III (3)**

Offered Fall. Instructor(s): Holloway.

**MUSI 428 ORGAN LITERATURE IV (3)**

Offered Spring. Instructor(s): Holloway.

**MUSI 429 MUSIC OF THE MIDDLE AGES (3)**

A study of the major musical styles and composers of western art music before 1400 and their historical, cultural, and sociological contexts. Cross-listed with MDST 429. Offered Fall. Instructor(s): Loewen.

**MUSI 431 AURAL SKILLS AND PERFORMANCE TECHNIQUES V (2)**

Continuation of MUSI 332. Offered Fall. Instructor(s): Gottschalk.

**MUSI 432 GRADUATE AURAL SKILLS REVIEW (2)**

A remedial course in ear-training, sight-singing, and musical dictation. Offered Spring. Instructor(s): Gottschalk.

**MUSI 435 CONTEMPORARY MUSIC ENSEMBLE (1)**

Note: Does not count as chamber music. Repeatable for Credit.

**MUSI 436 COLLEGIUM (1)**

Performance of music up to the early 17th century. Note: Does not count as chamber music. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Barnett; Loewen.

**MUSI 437 SEMINAR IN CHURCH MUSIC (2)**

A seminar in various aspects of church music. For organ majors only. Repeatable for Credit. Not offered this academic year. Instructor(s): Simpson.

**MUSI 438 SEMINAR IN CHURCH MUSIC II (2)**

Continuation of MUSI 437. Pre-requisite(s): MUSI 437. Not offered this academic year. Instructor(s): Simpson.

**MUSI 439 CHORAL CONDUCTING (3)**

The fundamental skills of choral conducting, including baton techniques, score reading, and rehearsal procedures. Conducting materials will be selected from representative choral works. Not offered this academic year. Instructor(s): Jaber.

**MUSI 440 CHORAL CONDUCTING II (3)**

Advanced techniques of choral conducting with emphasis on expressive gestures and phrasal conducting, interpretation and chironomy of chant, recitative conducting, repertoire selection, score preparation, and conducting of choral-instrumental works. Not offered this academic year. Instructor(s): Jaber.

**MUSI 441 SENIOR RECITAL (0)**

Department permission required. Offered Fall & Spring.

**MUSI 442 RECITAL ACCOMPANYING (1)**

Accompanying a single student recital, including the preview, dress rehearsal, performance, their lessons with the soloist's teacher, and practice times mutually agreeable to soloist and accompanist. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connelly.

**MUSI 443 STUDIO ACCOMPANYING (1)**

Accompanying private lessons in studios as assigned for a total of four hours per week. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connelly.

**MUSI 444 PRACTICUM IN CONTEMPORARY MUSIC (2)**

Each student will write a piece for an ensemble formed within the class. The piece will be rehearsed and coached as it is being written, and will be performed on various recitals. Must be enrolled in one of the following Major(s): Music. Repeatable for Credit. Not offered this academic year. Instructor(s): Lavenda.

**MUSI 445 KEYBOARD SKILLS I (2)**

For organ majors only. Must be enrolled in one of the following Major(s): Music. Offered Fall. Instructor(s): Kloeckner.

**MUSI 446 KEYBOARD SKILLS II (2)**

For organ majors only. Offered Spring. Instructor(s): Kloeckner.

**MUSI 447 INTRODUCTION TO PIANO TECHNOLOGY (2)**

Introduction to the tuning and maintenance of pianos. Includes the theory and acoustics of tuning, a brief history of the piano, and a general exposure to restoration, as well as "hands-on" experience. Offered Fall. Instructor(s): Shank.

**MUSI 448 PIANO TECHNOLOGY PRACTICUM FOR PIANISTS (2)**

A practicum exploring the basic maintenance procedures of the modern pianoforte. Students will learn cleaning and unison tuning as well as basic action regulation. Not offered this academic year. Instructor(s): Shank.

**MUSI 449 UNDERGRADUATE INDEPENDENT STUDY (1 TO 3)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 450 QUALIFYING RECITAL (0)**

Department permission required. Offered Fall & Spring.

**MUSI 451 FLUTE FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Buuse.

**MUSI 453 OBOE FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Atherholt.

**MUSI 454 OBOE TECHNOLOGY (2)**

A hands on study of the basic maintenance and regulation of the oboe, as well as an overview of available equipment for gonging and shaping. Recommended prerequisite(s): DMA enrollment in oboe performance. Instructor(s): Atherholt.

**MUSI 455 CLARINET FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Webster.

**MUSI 457 BASSOON FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kamins.

**MUSI 459 THEORY OF WOOD WIND PERFORMANCE TECHNIQUES (1)**

Primarily for conductors and composers.

**MUSI 461 HORN FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): VerMeulen

**MUSI 463 TRUMPET FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Speziale.

**MUSI 465 TROMBONE FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Waters.

**MUSI 467 TUBA FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kirk.

**MUSI 469 THEORY OF BRASS PERFORMANCE TECHNIQUES (1)**

Primarily for conductors and composers. Instructor(s): Speziale.

**MUSI 471 PERCUSSION FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Brown.

**MUSI 472 GENERAL PERCUSSION STUDIES (1)**

A class that will address other issues of percussion playing to prepare for a job that is not related to regular classical studies, i.e. drumset, jazz kits, rudimental drumming, instrument building, playing shows, sight-reading, etc. The emphasis of the class will vary each semester. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Brown.

**MUSI 473 VOICE FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kaun; King; Mentzer.

**MUSI 474 OPERA THEATER WORKSHOP (1)**

Operatic techniques for the singer/actor: the cultivation, through study and performance, of free, expressive and significant movement on stage, and the development of musical, dramatic and muscular sensitivity as the basis of good opera theater. Participation, according to ability, in scenes recitals and major productions. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dickinson.

**MUSI 475 THEORY OF VOCAL PERFORMANCE TECHNIQUES (1)**

Primarily for conductors and composers.

**MUSI 479 THEORY OF PERCUSSION PERFORMANCE TECHNIQUES (1)**

Primarily for conductors and composers.

**MUSI 481 PIANO FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connolly; JKFischer; Parker; Roux.

**MUSI 483 ORGAN FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Holloway.

**MUSI 486 FIGURED BASS AND CONTINUO REALIZATION (3)**

The semester begins with intensive drills to achieve complete fluency in reading figures and establishing effective keyboard techniques appropriate for continuo playing. The remainder of the semester is spent realizing continuo parts for vocal and instrumental genres from a wide variety of epochs. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Kloeckner.

**MUSI 487 HARP FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Page.

**MUSI 491 VIOLIN FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Goldsmith; Lin; Luca; Winkler.

**MUSI 492 STRING TECHNOLOGY (2)**

An introduction and practicum in the maintenance and repair of string instruments. Instructor permission required. Offered alternate years.

**MUSI 493 VIOLA FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunham; van der Werff.

**MUSI 495 VIOLONCELLO FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): N. Fischer; Harrell; B. Smith.

**MUSI 497 DOUBLE BASS FOR MAJORS (3)**

Must be enrolled in one of the following Level(s): Undergraduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Ellison; Pitts.

**MUSI 499 THEORY OF STRING PERFORMANCE TECHNIQUES (1)**

Primarily for conductors and composers. Offered alternate years.

**MUSI 503 ACOUSTICS (3)**

An introduction to the physical acoustics of sound and its psychological perception. Intended for those interested in applying these principles towards the composition of music using computer software systems. Instructor(s): Stallmann.

**MUSI 504 COMPUTER ASSISTED MUSIC COMPOSITION (3)**

Instructor permission required. Instructor(s): Stallmann.

**MUSI 505 MULTIMEDIA AUTHORIZING (3)**

Instructor permission required. Instructor(s): Stallmann.

**MUSI 511 GRADUATE THEORY REVIEW (3)**

Offered Fall. Instructor(s): Brandt.

**MUSI 512 ANALYTICAL SYSTEMS (3)**

Practical applications of principal analytical systems. Department permission required. Offered Spring. Instructor(s): Chen

**MUSI 513 MODAL COUNTERPOINT (3)**

Applied contrapuntal techniques of the 16th century, and analysis of selected works. Limited enrollment. Offered Fall. Instructor(s): Gottschalk.

**MUSI 514 SCORE READING AND THEORY AT THE KEYBOARD (3)**

Advanced studies in reading an orchestral score at the keyboard. Limited enrollment. Offered Fall. Instructor(s): Jalbert.

**MUSI 516 ADVANCED ORCHESTRATION (3)**

Advanced studies in orchestrational techniques from the classical era through the present day. Must be enrolled in one of the following Major(s): Music. Pre-requisite(s): MUSI 416 or permission of instructor. Limited enrollment. Offered Spring. Instructor(s): Jalbert.

**MUSI 517 EARLY MODERN MASTERS (3)**

Analysis of music from 1900-1950. Must be enrolled in one of the following Major(s): Music. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Brandt.

**MUSI 520 VERDI AND WAGNER (3)**

In-depth explanation of two operas of each composer (recent choices are Rigoletto, Falstaff, Tristan und Isolde, & Parsifal), and comparison of the style & influence of the two figures. We also place these composers & works in cultural context, especially nationalism and the "music of the future" debate. Limited enrollment. Not offered this academic year. Instructor(s): Citron.

**MUSI 521 GRADUATE REVIEW OF MUSIC HISTORY I (3)**

Survey of Medieval, Renaissance, and Baroque music for graduate students. Assigned on the basis of placement exam only. Offered Fall. Instructor(s): Loewen.

**MUSI 522 GRADUATE REVIEW OF MUSIC HISTORY II (3)**

Survey of Classical, Romantic and 20th century music for graduate students. Assigned on the basis of placement exam only. Offered Spring. Instructor(s): Barnett.



**MUSI 523 BIBLIOGRAPHY AND RESEARCH METHODS (3)**

Study of bibliography methods and techniques in research methodology. Limited enrollment. Offered Fall. Instructor(s): DuMont.

**MUSI 524 AMERICAN MUSIC (3)**

Exploration of art music in the United States, ca. 1800-ca. 1940, with reference to earlier American and European styles. Pre-requisite(s): MUSI 421. Limited enrollment. Not offered this academic year. Instructor(s): Bailey.

**MUSI 525 PERFORMANCE PRACTICES SEMINAR (3)**

The study of performing practices of music prior to the Romantic era. Topics will range from pre-performance considerations of pitch and tuning systems to those of performance, such as basso continuo realization, improvisation, vibrato, and articulation. Limited enrollment. Offered Spring. Instructor(s): Barnett.

**MUSI 526 WOMEN IN MUSIC (3)**

Study of gender in music, including aesthetics and representation, and of the major roles women have assumed in music, especially as composers, performers and patrons. While the course emphasizes the western art tradition, other types of music are explored as well. Cross-listed with SWGS 440. Limited enrollment. Offered Fall. Instructor(s): Citron.

**MUSI 527 TOPICS IN EARLY MUSIC (3)**

Advanced study in selected topics in music history prior to 1600. Topics may vary. Please consult with the department for additional information. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Loewen.

**MUSI 528 TOPICS IN THE 17TH AND 18TH CENTURIES (3)**

Topics in the 17th and 18th Centuries. Topics may vary. Please consult with the department for additional information. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Ferris.

**MUSI 529 TOPICS IN 19TH AND 20TH CENTURIES (3)**

Advanced study in selected topics in music history of the 19th and 20th centuries. Topics may vary. Please consult with the department for additional information. Repeatable for Credit. Limited enrollment. Offered Fall & Spring. Instructor(s): Citron.

**MUSI 531 ORCHESTRAL REPERTOIRE (1)**

Section 1: violin; Section 2: viola; Section 3: cello; Section 4: double bass; Section 5: woodwinds; Section 6: brass; Section 7: percussion; Section 8: harp. Repeatable for Credit. Offered Fall & Spring.

**MUSI 533 GRADUATE CONDUCTING SEMINAR (1)**

Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rachleff.

**MUSI 545 SERVICE SKILLS I (2)**

For organ majors only. Not offered this academic year. Instructor(s): Kloeckner.

**MUSI 546 SERVICE SKILLS II (2)**

For organ majors only. Not offered this academic year. Instructor(s): Holloway.

**MUSI 547 ORGAN PEDAGOGY (2)**

Offered Fall. Instructor(s): Holloway.

**MUSI 549 VOCAL PHYSIOLOGY & FUNCTION (2)**

Introduction to anatomy, physiology and function of the singing voice. Must be enrolled in one of the following Level(s): Graduate. Limited enrollment.

**MUSI 551 MUSIC OF RICHARD STRAUSS (3)**

An examination of Strauss's musical style and professional reputation in the context of changing aesthetic and political perspectives from the 1880s to the 1940s. Analysis of selected lieder, symphonic poems, and operas, including "Salome" and "Der Rosenkavalier". Limited enrollment. Not offered this academic year. Instructor(s): Bailey.

**MUSI 552 WORDS AND MUSIC (3)**

A study of the relationship between text and music in non-operatic solo vocal repertory drawn from a wide historical range. Topics will include: correspondences between musical and poetic forms, how a song transforms the text that it sets, how text expression has led composers to experiment with musical style. Limited enrollment. Not offered this academic year. Instructor(s): Ferris.

**MUSI 559 WOODWIND PEDAGOGY (2)**

Repeatable for Credit. Offered alternate years.

**MUSI 569 BRASS PEDAGOGY (2)**

Offered alternate years.

**MUSI 571 VOCAL COACHING (1)**

Repeatable for Credit. Offered Fall & Spring. Instructor(s): deChambrier; Jaber.

**MUSI 572 OPERA ROLE PERFORMANCE (1)**

After audition, opera director makes role assignments and grants credit to roles that are deemed significant. Enrollment is only by permission of opera director, for those preparing and performing roles in opera theater productions. Instructor permission required. Repeatable for Credit. Limited enrollment. Instructor(s): Bado.

**MUSI 573 ITALIAN DICTION (1)**

**MUSI 574 GERMAN DICTION (1)**

**MUSI 575 VOICE REPERTOIRE I (2)**

Offered Fall. Instructor(s): N. Bailey.

**MUSI 576 VOICE REPERTOIRE II (2)**

Offered Spring. Instructor(s): N. Bailey.

**MUSI 577 ENGLISH DICTION (1)**

**MUSI 578 FRENCH DICTION (1)**

Instructor(s): DeChambrier.

**MUSI 579 PERCUSSION PEDAGOGY (2)**

**MUSI 583 INSTRUMENTAL ACCOMPANYING TECHNIQUES (2)**

A course for piano majors, emphasizing practical skills of accompanying strings and wind instruments in a wide variety of repertoire. Instructor(s): Connelly.

**MUSI 584 VOCAL COACHING TECHNIQUES FOR PIANISTS (2)**

A course for piano majors, to develop skills of accompanying and coaching singers. Topics will include basic vocal production and terminology, lieder, opera, and oratorio. Instructor permission required. Offered alternate years.

**MUSI 588 PIANO PEDAGOGY I (2)**

An overview of the group piano area which includes a comprehensive study of standard methods, in-depth discussion of group vs. individual lessons, and a supervised student teaching practicum. Offered alternate years. Instructor(s): Park.

**MUSI 589 PIANO PEDAGOGY II (2)**

An intensive study of studio teaching with an overview of different methods as well as guidance in studio organization and management. Each student will participate in a private teaching practicum as well. Offered alternate years. Instructor(s): Park.

**MUSI 599 STRING PEDAGOGY (2)**

Section 1 Violin; Section 2 Viola; Section 3 Cello; Section 4 Double Bass. Offered alternate years.

**MUSI 601 COMPOSITION FOR MAJORS ADVANCED AND**

**GRADUATES (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Al-Zand; Brandt; Chen; Gottschalk; Jalbert; Lavenda; Stallmann.

**MUSI 603 GRADUATE COMPOSITION SEMINAR (1)**

Repeatable for Credit. Offered Fall & Spring.

**MUSI 605 ADVANCED ELECTRONIC AND COMPUTER MUSIC**

**SYSTEMS (3)**

Advanced topics and applications in computer and electronic music composition. Instructor permission required. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Stallmann.

**MUSI 606 ADVANCED COMPUTER SOUND SYNTHESIS (3)**

Continuation of MUSI 605. Pre-requisite(s): MUSI 605. Department permission required. Repeatable for Credit. Limited enrollment. Offered Spring. Instructor(s): Stallmann.

**MUSI 610 ADVANCED OPERA WORKSHOP (2)**

For Doctoral students only. Provides singers with broad understanding of opera production. Lectures emphasize the exploration of music and text to develop the director's concept, the development of underlying themes through staging, technical aspects of opera production, and methods for coaching singing actors. Students will direct and perform in opera scenes. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dickinson.

**MUSI 611 CLASSROOM PEDAGOGY (3)**

The practical application of various teaching methods, and an in depth study of college-level materials. Department permission required. Limited enrollment. Offered Spring. Instructor(s): Lavenda.

**MUSI 613 TONAL COUNTERPOINT (3)**

18th Century counterpoint in the style of J.S. Bach. Limited enrollment. Offered Spring. Instructor(s): Al-Zand.

**MUSI 614 SPECIAL TOPICS IN MUSIC THEORY (3)**

Topics may vary. Please consult with the department for additional information.

**MUSI 615 INTRODUCTION TO JAZZ (3)**

Topics in jazz analysis and performance. Examination of important jazz recordings and a consideration of the music's historical development and social context. Open to both music and non-music majors and to both jazz and classical performers. Recommended prerequisite(s): Ability to read music well and some previous study in music theory. Offered alternate years. Instructor(s): Al-Zand.

**MUSI 617 MUSIC SINCE 1950 (3)**

Study and analysis of composers and music from Post- World War II to the present. Limited enrollment. Offered Spring. Instructor(s): Chen.

**MUSI 619 HISTORY OF THE 20TH CENTURY PIANISM (2)**

A critical survey of the great pianists of the 20th century covering the stylistic and pianistic traits of each, including a selective discography for each pianist. Must be enrolled in one of the following Major(s): Music. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Park.

**MUSI 620 HISTORICAL OVERVIEW OF PIANO TECHNIQUE (2)**

A survey of the teaching of piano technique from the historical perspective. The focus will be on documents and quotes from historical pedagogues such as C.P.E Bach, Czemlinski, Chopin, and the pianists of the 20th century. Must be enrolled in one of the following Major(s): Music. Instructor permission required. Limited enrollment. Instructor(s): Park.

**MUSI 621 SELECTED STUDIES IN MUSIC HISTORY (3)**

Seminar on individual topics in music history. Content varies. Repeatable for Credit. Limited enrollment. Not offered this academic year.

**MUSI 622 EARLY OPERA (3)**

A study of opera history from the beginning of the seventeenth Century through Mozart's early works of the 1770's. We will consider literary sources, versification, musical forms, and the periodic "reforms" within the first two centuries of opera. Limited enrollment. Offered Fall. Instructor(s): Barnett.

**MUSI 623 J.S. BACH: CAREER, WORKS, AND CRITICAL RECEPTION (3)**

An examination of Bach's music and the social circumstances in which he created it. A substantial portion of the course will focus on issues and controversies in recent Bach scholarship. Limited enrollment. Not offered this academic year. Instructor(s): Barnett.

**MUSI 624 SEMINAR ON A SELECTED COMPOSER (3)**

Advanced study of the music of a single composer. Topics may vary. Please consult with the department for additional information. Repeatable for Credit. Limited enrollment. Offered Fall. Instructor(s): Bailey.

**MUSI 625 MOZART OPERAS (3)**

Study of three or four of Mozart's operas in-depth, with a focus on how music shapes drama, interpretation, characterization, and meaning. Limited enrollment. Not offered this academic year. Instructor(s): Citron.

**MUSI 626 THE CLASSICAL STYLE (3)**

A study of the way in which Haydn, Mozart, and Beethoven create large musical forms that have purely musical meaning, which does not derive from a text. We will consider various approaches to understanding musical meaning including rhetoric, structure, and style. Limited enrollment. Not offered this academic year. Instructor(s): Ferris.

**MUSI 627 ROMANTIC SONGS AND PIANO PIECES (3)**

Study of songs and piano character pieces of Schumann, Chopin, Mendelssohn, and Schubert from analytical and historical perspectives. Limited enrollment. Not offered this academic year. Instructor(s): Ferris.

**MUSI 628 BRAHMS (3)**

Study of Brahms in the context of 19th-century music and culture. Selected works are analyzed in detail and interpreted in light of formative influences (Schumann and older music) and contemporary debates (Wagnerism and Viennese musical politics). Limited enrollment. Not offered this academic year. Instructor(s): Citron.

**MUSI 629 OPERA 1875-1925 (3)**

In-depth study of Bizet's Carmen, Verdi's Othello, Strauss's Elektra, and Berg's Wozzeck. The course emphasizes the role of music in shaping drama, characterization, and meaning. Limited enrollment. Offered Spring. Instructor(s): Citron.

**MUSI 630 GRADUATE CHORAL CONDUCTING SEMINAR (3)**

Repeatable for Credit. Offered Fall & Spring. Instructor(s): Jaber.

**MUSI 631 MOCK AUDITION (0)**

Department permission required. Offered Fall & Spring.

**MUSI 633 COMPREHENSIVE PRACTICUM IN PIANO TUNING (3)**

The complete restoration of a studio or performance piano under the scrutiny of the instructor. Areas of emphasis include restringing, the installation of new action parts and dampers, and the finish regulation and voicing of these parts. Not offered this academic year. Instructor(s): Shank.

**MUSI 635 ADVANCED ORCHESTRA (2)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rachleff.

**MUSI 636 ADVANCED CHAMBER MUSIC (1)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring.

**MUSI 637 ADVANCED CONDUCTING FOR MAJORS (3)**

Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rachleff.

**MUSI 640 ADVANCED CHORUS (1)**

Section 1, Shepherd Singers (by audition only); Section 2, Rice Chorale; Section 3, Sallyport. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Jaber.

**MUSI 641 MASTER'S RECITAL I (0)**

Department permission required. Offered Fall & Spring.

**MUSI 642 ACCOMPANYING INSTEAD OF ENSEMBLE (1)**

Taken in lieu of MUSI 635 or 640. Student to fulfill requirements of MUSI 442 or 443. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connelly.

**MUSI 645 ORGAN CONSTRUCTION (2)**

Not offered this academic year. Instructor(s): Visser.

**MUSI 647 MASTER'S THESIS (3)**

Repeatable for Credit. Offered Fall & Spring.

**MUSI 649 GRADUATE INDEPENDENT STUDY (1 TO 3)**

Department permission required. Repeatable for Credit. Offered Fall & Spring.

**MUSI 651 FLUTE FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Buys.

**MUSI 653 OBOE FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Atherholt.

**MUSI 655 CLARINET FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Webster.

**MUSI 656 BASSOON FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kamins.

**MUSI 661 HORN FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): VerMeulen.

**MUSI 663 TRUMPET FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Speziale.

**MUSI 665 TROMBONE FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Waters.

**MUSI 667 TUBA FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kirk.

**MUSI 671 PERCUSSION FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Brown.

**MUSI 673 VOICE FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Kaun; King; Mentzer.

**MUSI 681 PIANO FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connelly; Parker; Roux.

**MUSI 683 ORGAN FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Holloway.

**MUSI 686 APPLIED PIANO TECHNOLOGY (3)**

The comprehensive study of tuning all important historical and modern temperaments; supervised work on action voicing, regulation, and restoration. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Not offered this academic year. Instructor(s): Shank.

**MUSI 687 HARP FOR MAJORS-ADVANCED (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Page.

**MUSI 689 PIANO FOR CHAMBER MUSIC AND ACCOMPANYING MAJORS, ADVANCED/GRADUATE (3)**

Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Connelly.

**MUSI 690 INDIVIDUAL INSTRUMENT COACHING FOR STRING QUARTET MAJORS (2)**

Advanced individual instrumental coaching for students in the M.Mus. string quartet program. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunham; Fischer; Goldsmith.

- MUSI 691 VIOLIN FOR MAJORS-ADVANCED (3)**  
Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Goldsmith; Lin; Luca; Winkler.
- MUSI 693 VIOLA FOR MAJORS-ADVANCED (3)**  
Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunham; van der Werff
- MUSI 695 VIOLONCELLO FOR MAJORS-ADVANCED (3)**  
Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): N. Fischer; Harrell; B. Smith.
- MUSI 697 DOUBLE BASS FOR MAJORS-ADVANCED (3)**  
Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Ellison; Pitts.
- MUSI 698 ADVANCED STRING QUARTETS (4)**  
Private lessons for graduate students enrolled in the M.Mus. string quartet program. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dunham.
- MUSI 700 GRADUATE RESEARCH (1 TO 9)**  
Repeatable for Credit.
- MUSI 707 DOCTORAL INDEPENDENT STUDY, COMPOSITION (3)**  
Independent project at the doctoral level. Instructor permission required. Instructor(s): Gottschalk.
- MUSI 711 ANALYTICAL APPROACHES (3)**  
In depth exploration of tonal and post-tonal analytical procedures. Required of all doctoral students. Instructor permission required. Recommended prerequisite(s): MUSI 512 or equivalent. Offered Spring. Instructor(s): Al-Zard.
- MUSI 712 SEMINAR IN ADVANCED ANALYSIS (3)**  
This class will build on the concept and materials presented in MUSI 711. Students will do in-depth analyses of significant pieces from several style periods. Pre-requisite(s): MUSI 711. Instructor permission required. Limited enrollment. Offered alternate years. Instructor(s): Lavenda.
- MUSI 721 MUSIC OF SCHOENBERG (3)**  
Study of the music of Arnold Schoenberg in the context of the major musical centers and artistic movements that colored his works: Vienna, Berlin, romanticism, expressionism and the New Objectivity. Limited enrollment. Offered Spring. Instructor(s): Bailey.
- MUSI 722 MUSIC OF STRAVINSKY (3)**  
Study of Igor Stravinsky's major works to ca.1925 in the context of his early training, commissions from Diaghilev, exile in Switzerland, and post-war prominence in Paris. Limited enrollment. Not offered this academic year. Instructor(s): Bailey.
- MUSI 723 AESTHETICS OF MUSIC (3)**  
An introduction to music aesthetics, focusing on contemporary theories and writings. Limited enrollment. Offered Fall. Instructor(s): Lavenda.
- MUSI 733 DOCTORAL SEMINAR I: CAREER SKILLS (3)**  
Practical training in digital recording, editing, and producing and preparation for academic jobs. Required of, and limited to, doctoral music majors. Must be enrolled in one of the following Major(s): Music. Department permission required. Limited enrollment. Instructor(s): Stallmann.
- MUSI 735 DOCTORAL SEMINAR II: REPERTORY (3)**  
In-depth study of chamber music and concert repertory. Required of, and limited to, all doctoral music students. Must be enrolled in one of the following Major(s): Music. Department permission required. Limited enrollment. Instructor(s): Rarick.
- MUSI 736 SOLO REPERTORY FOR DOCTORAL STUDENTS (3)**  
One semester required of all doctoral students on performance areas. Additional semesters may be taken at the discretion of the major teacher. Must be enrolled in one of the following Major(s): Music. Department permission required. Repeatable for Credit. Limited enrollment.
- MUSI 738 DOCTORAL INDIVIDUAL PROJECT (3)**  
A substantial project in an area of the student's interest. Working with a faculty member, each doctoral music student will propose, carry out and then give a public report on the project. Proposals must be approved by the Graduate Studies Committee. Must be enrolled in one of the following Major(s): Music. Department permission required. Limited enrollment.

**MUSI 739 PEDAGOGY FOR DOCTORAL STUDENTS (3)**

The study of methods and materials specific to each student's major, focusing on the teaching of private studio lessons and instrumental or vocal classes for college-level students. Includes practical training. Each student will work with their major teacher or a faculty member designated by their department. Section 001 - PIANO; 002 - VOICE; 003 - FLUTE; 004 - CLARINET; 005 - OBOE; 006 - VIOLIN; 007 - VIOLA; 008 - CELLO; 009 - DOUBLEBASS; 010 - PERCUSSION. Department permission required. Limited enrollment.

**MUSI 741 MASTER'S RECITAL II (0)**

Department permission required. Offered Fall & Spring.

**MUSI 742 STRING QUARTET RECITAL (0)**

Each recital will include a format chosen by the quartet and natural to them in which they relate to the general public in a meaningful, non-technical way (i.e., pre-concert question and answer session, etc.). These are not lecture-recitals in the traditional, academic sense: their aim is to give the quartet guidance and experiences in how to impart substantive information that help non-musicians deepen their concert-going experience. Department permission required. Repeatable for Credit. Limited enrollment. Offered Fall & Spring.

**MUSI 747 SURVEY-ORCHESTRAL REPERTOIRE (2)**

A survey of the techniques of orchestral playing with emphasis on preparation of orchestral excerpts for professional auditions.

**MUSI 749 APPRENTICESHIP (1 TO 3)**

Repeatable for Credit.

**MUSI 750 DOCTORAL DOCUMENT (3)**

Supervised research and writing of doctoral document. Repeatable for Credit.

**MUSI 751 DOCTORAL RECITAL (0)**

Section 1, solo; section 2, chamber; section 3, concerto; section 4, lecture. Department permission required. Repeatable for Credit.

**MUSI 800 DISSERTATION (3)**

Substantial original music composition. Instructor permission required. Repeatable for Credit.

**NAVA (NAVAL SCIENCE)****No College Designated/Naval Science****NAVA 101 NAVAL ORIENTATION (3)**

An introduction to naval traditions and customs, seamanship, naval organization and missions, and the fundamental concepts of sea power. Offered Fall. Instructor(s): Carlucci.

**NAVA 102 NAVAL ENGINEERING (3)**

Ship propulsion systems, auxiliary systems, steering systems, electrical power distribution, ship design, ship stability and damage control measures. Offered Fall. Instructor(s): Lentz.

**NAVA 201 NAVAL WEAPONS-NAVAL SHIP SYSTEMS II (3)**

The theory and employment of weapons systems. The student explores the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. The physical aspects of radar and underwater sound are described in detail. Offered Spring. Instructor(s): Lentz.

**NAVA 202 SEA POWER AND MARITIME AFFAIRS (3)**

Readings, discussions, and research on selected topics related to the history, importance, and impact of sea power on modern civilization. Offered Spring. Instructor(s): Carlucci.

**NAVA 301 NAVIGATION I (3)**

Marine navigators and laws of vessel operations. Includes coastal piloting, navigational aids, nautical astronomy, satellite and inertial systems, and rules of the nautical road. Offered Spring. Instructor(s): Lentz.

**NAVA 302 NAVAL OPERATIONS AND SEAMANSHIP (3)**

An analysis of ship movements, formations, and fleet operations; includes Rules of the Road, maneuvering board, tactical publications and communications. Offered Fall. Instructor(s): Lentz.

**NAVA 303 EVOLUTION OF WARFARE (3)**

Historical survey of the evolution of the conduct of warfare. Strategy, tactics, weapons, organization, and military leaders/thinkers are studied. Offered Fall. Instructor(s): Schouten.

**NAVA 401 LEADERSHIP MANAGEMENT I (3)**

An introduction to the principles and concepts of management, organization, leadership, information systems, and decision making. Offered Fall. Instructor(s): Cerrillo.

**NAVA 402 LEADERSHIP AND ETHICS (3)**

Leadership principles, with particular emphasis on ethics, human resources management, military law and discipline, and administration. The Capstone course for NROTC seniors. Pre-requisite(s): NAVA 401. Recommended prerequisite(s): Spring semester of senior year. Offered Spring. Instructor(s): Murray.

**NAVA 410 AMPHIBIOUS WARFARE (3)**

Study of the history of amphibious warfare, using case studies to examine doctrine tactics, and the factors necessary for successful operations. Offered Fall. Instructor(s): Schouten.

**NEUR (NEUROSCIENCE)****No College Designated/Other/No Department****NEUR 415 THEORETICAL NEUROSCIENCE (3)**

This course introduces current theoretical methods used to model the properties of nerve cells and the processing of information by neuronal networks. Concrete examples that can be implemented using MATLAB will be emphasized. The starting point is the passive cable properties of single neurons and the Hodgkin-Huxley model of action potential generation. Subsequently, models of synaptic transmission and active properties of dendritic trees will be considered. This will be followed by stochastic properties of single neurons and information encoding using mean and instantaneous firing rates in visual neurons. Finally, methods to analyze phase-locking and activity in populations of cells as well as learning algorithms will be considered. Cross-listed with CAAM 415. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Cox.

**NEUR 501 COGNITIVE NEUROSCIENCE I (3)**

Overview of neuropsychological and cognitive neuroscience approaches to higher mental functions including sensation and perception, attention, motor control, and neuroplasticity. Other topics include basic neuroanatomy, experimental and clinical investigative methods and the historical and philosophical context of contemporary neuroscience. Cross-listed with PSYC 575. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Ro.

**NEUR 502 COGNITIVE NEUROSCIENCE II (3)**

Overview of neuropsychological and cognitive service approaches to higher mental functions including language, memory, executive functions, reasoning, and numerical processing. Cross-listed with PSYC 576. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Martin.

**NEUR 504 CELLULAR NEUROPHYSIOLOGY I & II (3)**

Properties of excitable nerve membranes and chemical synapses; theory of ions in solutions, ion conduction through membranes, ion transport, linear cable theory, nonlinear properties of neurons, + stochastic properties of single ion channels, synaptic transmission, the role of calcium and transmitter release, + postsynaptic mechanism. Taught at Baylor; check NEUR website. Pre-requisite(s): PHYS 125 and MATH 101. Instructor permission required. Repeatable for Credit. Instructor(s): Dannemiller; Wu.

**NEUR 505 OPTICAL IMAGING (3)**

This course includes a theoretical portion, which will introduce the fundamentals of optical imaging of neural activity, present the devices that are employed, and review applications and discuss their results. In addition, in a practical part, students will design, set up, and perform simple in vitro experiments to gain practical experience with this exciting and powerful technology. Instructor permission required. Offered alternate years. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Saggau.

**NEUR 506 CONCEPTS OF LEARNING AND MEMORY (3)**

This course is designed to introduce graduate students to the field of learning and memory. This field has exploded in the last few years with the introduction of new techniques, new approaches, and new concepts. The course will introduce the student to classical and modern concepts of learning and memory across all levels at which learning and memory is studied, including behavioral, anatomical, cellular, molecular and genetic levels of analysis. The basic concepts of learning and memory will also be related to known diseases of learning and memory. Instructor permission required. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Davis; Sweatt.

**NEUR 511 INTEGRATIVE NEUROSCIENCE CORE I (5)**

A broad introductory survey covering all aspects of neuroscience, team-taught by faculty from Baylor College of Medicine. Includes a lab at Baylor. This is the entry level neuroscience course for all Rice students. Please contact Dr. James Pomerantz if you wish to enroll. Instructor permission required. Limited enrollment. Offered Fall. URL: [www.ruf.rice.edu/~neurosci/](http://www.ruf.rice.edu/~neurosci/). Instructor(s): Baylor faculty.

**NEUR 512 INTEGRATIVE NEUROSCIENCE CORE II (5)**

A broad introductory survey covering all aspects of neuroscience, team-taught by faculty from Baylor College of Medicine. A continuation of NEUR 511. Course taught at Baylor. Pre-requisite(s): NEUR 511. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Baylor faculty.

**NEUR 515 NEURAL DEVELOPMENT (3)**

An advanced graduate course focusing on molecular genetic studies. Integrates molecular patterning of nervous system with developmental neuroscience using a cross-species approach, with an emphasis on the visual system. Topics include the biochemical and genetic basis for neural plasticity, neurotrophic factors in neural development, and the molecular mechanism of growth core guidance and synapse formation. Instructor permission required. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Crair.

**NEUR 516 SENSORY SYSTEMS (3)**

A two-part course covering sensory transduction in audition, touch, and the chemical senses, and a detailed coverage of the visual system, including retinal structures and central pathways, phototransduction, receptive fields, and functional organization in the cortex. Instructor permission required. Limited enrollment. Offered Spring. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Eatock; Wu.

**NEUR 517 MECHANISMS OF MEMORY (3)**

Synthesizes our understanding of the mechanism of higher-order memory formation covering learning theory, cellular physiology and biochemistry and discussing memory disorders. Instructor permission required. Limited enrollment. Offered Fall. URL: [www.ruf.rice.edu/~neurosci/](http://www.ruf.rice.edu/~neurosci/). Instructor(s): Sweatt.

**NEUR 520 TEN UNSOLVED QUESTIONS IN NEUROSCIENCE (3)**

Neuroscience has yet to establish its general principles. This course introduces the major topics including memory, sleep, consciousness, information in neural activity, emotions, plasticity, and intelligence. Each week's lecture introduces a new problem, addressing why the question is important, its history, current thinking, and what we have learned. Instructor permission required. Limited enrollment. URL: [www.ruf.rice.edu/~neurosci](http://www.ruf.rice.edu/~neurosci). Instructor(s): Egleman.

**NEUR 577 INTRODUCTION TO FUNCTIONAL NEUROANATOMY (2)**

Anatomy and function of components of the nervous system with an emphasis on the central nervous system. This course is offered for Rice psychology graduate students only. Must be enrolled in one of the following Level(s): Graduate. Instructor permission required. URL: [www.ruf.rice.edu/~neurosci/](http://www.ruf.rice.edu/~neurosci/). Instructor(s): Thalmann.

**NEUR 578 HIGHER BRAIN FUNCTION (3)**

Aspects of systems' neuroscience related to higher brain function: (1) role of limbic system in higher brain functions, (2) role of the extended amygdala and the mesolimbic system in reward and addiction, (3) discussion of human brain processes including decision making, goal directed learning and representation of self and others. Instructor permission required. URL: <http://www.ruf.rice.edu/~neurosci>. Instructor(s): De Biasi.

**NSCI (NATURAL SCIENCES)****School of Natural Sciences/Natural Sciences Division****NSCI 111 CONCEPTS IN PHYSICS AND ASTRONOMY (3)**

This course is intended as an investigation of some of the major concepts in physics and astronomy that form the basis of our modern understanding of the universe. By focusing on scientific methodology and a few universal laws, the course will help students appreciate scientific discoveries and give them the conceptual understanding to form intelligent views of contemporary scientific issues. For non-science/engineering majors. Instructor(s): Toffoletto.

**NSCI 121 WRITING PROFESSIONALLY IN THE NATURAL SCIENCES (2)**

To begin to develop a professional identity, students will learn to document research or clinical activities, present research findings, interpret information, and summarize their work. Writing workshops will be based on simulated and virtual laboratory or clinical activities. Includes group work. Meshes well with BIOS 125, 211, or 311. NOTE: Pilots materials developed from instructor comments on lab-work. Limited enrollment. Instructor(s): Eich; Purugganan

**NSCI 142 SCIENCE FOR CHANGING TIMES (3)**

This course is designed for non-science and non-engineering majors. In it, we will explore topics having a direct impact on our lives right now and in the future. These will include nuclear medicine, global warming, water pollution, the chemical industry, cloning and genetic engineering, health and fitness, and drugs. Learn to be an active and informed citizen. Limited enrollment. Offered Spring. Instructor(s): Kinsey.

**NSCI 230 COMPUTATION IN SCIENCE AND ENGINEERING (3)**

The course introduces basic techniques for problem solving and visualization using computational environments such as Mathematica. Class will consist of self-paced modules covering topics in science and engineering that will be completed in Symonds II Lab. No previous programming experience is required or expected. Cross-listed with COMP 110. Limited enrollment. Instructor(s): Goldman.

**NSCI 305 NEW VENTURE COMMUNICATION FOR SCIENCE AND ENGINEERING (1)**

Teaches students in science or engineering the skills needed to discover, communicate, and promote products and services based on technological innovation or scientific research. Students learn to innovate a product or service with social or commercial application, write an early-stage business plan, and give a 10-minute financing presentation. Not offered this academic year.

**NSCI 501 PROFESSIONAL MASTER'S SEMINAR (1)**

A weekly seminar which serves to provide exposure to local industry leaders from the areas of oil and gas exploration, nanotechnology, and environmental management; introduce career management and business relations tools; further develop written and oral communication skills; provide a forum for students to present internship project results. Repeatable for Credit.



**NSCI 505 ENVIRONMENTAL LAB (1)**

Laboratory module offered in conjunction with CAAM 353 that illustrates applications of numerical analysis in the solutions of common environmental science and engineering problems. Instructor permission required.

**NSCI 506 ENVIRONMENTAL CASE STUDIES (1)**

Seminar bringing in outside speakers from the community to address environmental issues.

**NSCI 510 PROFESSIONAL MS INTERNSHIP (12)**

Supervised internship or project associated with pursued degree. Exclusively for students in the Professional Master's Program. Repeatable for Credit.

**NSCI 511 SCIENCE, POLICY, AND ETHICS (3)**

An introduction to the policy, ethics, politics, and legal issues that relate to science and technology - discovery and application. This course presents a framework for analyzing ethical issues in business and professional work. The course then explores the ways in which government policy and business practices can promote or inhibit advances in science and technology while influencing the ethical choices of the professionals involved. Case studies will be used.

**NSCI 512 PROFESSIONAL MASTER'S PROJECT (1)**

Professional master students present the results of their internship or independent project. Prerequisite(s): NSCI 510.

**NSCI 580 CONTEMPORARY TOPICS IN ELEMENTARY SCHOOL MATHEMATICS (1 TO 6)**

Mathematical topics related to the elementary grades that include number and operations, geometry, probability and statistics, patterns and functions, and measurement. Hands-on experiences in innovative methods using manipulatives and technology, problem-solving techniques, and motivational strategies. Curriculum development using the RUSMP Learning Plan. Assessment for elementary school classrooms.

**NSCI 585 CONTEMPORARY TOPICS IN MIDDLE SCHOOL MATHEMATICS (1 TO 6)**

Mathematics topics related to middle school mathematics that include number concepts, ratio and proportion, geometry, measurement, probability and statistics, variables, and functions. A problem-solving approach to teaching mathematics with an emphasis on the use of manipulatives and technology. Curriculum development using the RUSMP Learning Plan. Assessment for middle school mathematics classrooms.

**NSCI 586 CONTEMPORARY TOPICS IN K-12 SCIENCE AND MATHEMATICS (1 TO 6)**

Contemporary topics in grades K-12 SCIENCE AND MATHEMATICS instruction - covers both content and pedagogy. Multiple sections are offered. Each section focuses on specific areas of instruction at specified grade levels. All sections include field studies, inquiry, curriculum development and implementation of instructional strategies in the classroom. Students may enroll in different sections for repeated credit. These courses do not count toward graduate degrees in Natural Science. Repeatable for Credit.

**NSCI 590 CONTEMPORARY TOPICS IN SENIOR HIGH SCHOOL MATHEMATICS (1 TO 6)**

Mathematical topics related to high school mathematics that include geometry, probability and statistics, functions, limits, sequences and series, and number theory. A problem-solving approach to teaching mathematics with an emphasis on the use of manipulatives and technology. Curriculum development using the RUSMP Learning Plan. Assessment for high school mathematics classrooms.

**NSCI 592 SEMINAR IN SCIENCE FOUNDATIONS (3)**

SEMINAR IN SCIENCE FOUNDATIONS \*\*\*\*\* Seminar with a team of university faculty and community-based scientists (in fields such as medicine, space, energy, and the environment) to increase understanding of scientific principles as they are applied in the scientific community of Houston and as they relate to secondary school science.

**NSCI 595 TOPICS IN CONTEMPORARY ALGEBRA FOR IN-SERVICE TEACHERS (1 TO 6)**

Teaching beginning algebra with an emphasis on mathematical models and representations, variables and functions, and symbolic reasoning. Foundation concepts for secondary mathematics, algebraic thinking and symbolic reasoning, function concepts, relationship between algebra and geometry, and underlying mathematical processes. Use of manipulatives and technology. Curriculum development using the RUSMP Learning Plan development and assessment strategies.

**NSCI 610 MANAGEMENT FOR SCIENCE AND ENGINEERING (3)**

This course is for graduate and undergraduate students who want to understand the basics of management in new and/or small technology-based businesses and is particularly relevant to students who are interested in careers in technology or entrepreneurial ventures. NSCI 610/ENGI 610 is team taught to provide insight into how technology oriented firms manages people, projects, accounting, marketing, strategy, intellectual property, organizations and entrepreneurship. Students' active participation is essential. Students who take this course are eligible for MGMT 625. Limited enrollment. Offered Fall. Instructor(s): Wilkinson; Barron.

## PHIL (PHILOSOPHY)

### School of Humanities/Philosophy

#### **PHIL 100 PROBLEMS OF PHILOSOPHY (3)**

An introduction to philosophy through such fundamental problems as the basis of morality, the foundation of state authority, determinism and freedom, and the possibility of knowledge. Offered Fall & Spring. Instructor(s): Sheinman; Sher.

#### **PHIL 101 CONTEMPORARY MORAL ISSUES (3)**

Examination of moral issues surrounding such topics as abortion, euthanasia, war, capital punishment, justice, and equality. Offered Fall & Spring. Instructor(s): Sher.

#### **PHIL 103 PHILOSOPHICAL ASPECTS OF COGNITIVE SCIENCE (3)**

An examination of current research in cognitive science and its philosophical implications. Topics include whether the mind is a computational system, how the mind is organized, whether certain components of the mind are innate. Offered Fall.

#### **PHIL 104 PHILOSOPHICAL PERSPECTIVES ON SCIENCE (3)**

The nature, origins, and impact of scientific knowledge will be examined from a variety of disciplinary perspectives. In addition to works by some of the most relevant philosophers of the past, including Descartes and Hume, readings will include writings of scientists such as Newton, and from 20th-century philosophers, and historians. Normally offered every year. Offered Fall. Instructor(s): Fagan.

#### **PHIL 105 HISTORICAL INTRODUCTION TO PHILOSOPHY (3)**

Study and discussion of central issues of Western philosophy as developed by its original thinkers from the ancient Greeks to the twentieth century. Enrollment will be limited in order to focus special attention on student writing. Limited enrollment. Offered Spring. Instructor(s): Prince.

#### **PHIL 106 LOGIC (3)**

Introduction to the formal theory of reasoning, which will be used to assess the validity of arguments in natural languages. Study of general properties of logical implication and logical truth. Offered Spring.

#### **PHIL 116 INTRODUCTION TO THE PHILOSOPHY OF LAW (3)**

The course will discuss the nature of law in general as well as discrete topics in legal philosophy. How is a legal rule different from an order backed by a terrorist threat? Is retroactive legislation legal? What are legal rights? Is there a general moral duty to obey the law? Offered Fall. Instructor(s): Sheinman.

#### **PHIL 120 ETHICS OF LEADERSHIP (1)**

This class explores the ethical implications of leadership. The course includes: a presentation of some main approaches to ethics; class discussion of the ethical dimensions of the very concept "leader"; and a series of case studies. The course has no pre-requisites. Limited enrollment. Not offered this academic year.

#### **PHIL 201 HISTORY OF PHILOSOPHY I (3)**

Survey of the major philosophers and philosophical systems of ancient Greece, from Parmenides to the Stoics. Cross-listed with CLAS 201, MDST 201. Offered Fall. Instructor(s): Morrison.

#### **PHIL 202 HISTORY OF PHILOSOPHY II (3)**

A survey of the history of philosophy from the 17th- to the 20th century. Offered Spring. Instructor(s): Kulstad.

#### **PHIL 205 INTRODUCTION TO THEORIES/PRACTICES OF SCIENCE AND TECHNOLOGY STUDIES (3)**

This discussion-based course, covers social, cultural, political, and historical dimensions of science and technology. Problems, qualitative methods, and theory in analyses of science and technology; sociology of scientific knowledge; contemporary and historical case studies; scientific and technical knowledge in historical, institutional, and organizational contexts. Attention to cultural studies and feminist approaches to interdisciplinary studies of scientific knowledge and expertise. Offered Fall & Spring. Instructor(s): Koay; Poser.

#### **PHIL 206 THE ETHICAL NATURE AND LIMITS OF PROFESSIONALISM IN MEDICINE (3)**

This course will critically examine the ethical nature of medicine as a profession and ethically justifies limits on medical professionalism in the context of contemporary ethical and public policy controversy. Not offered this academic year. Instructor(s): McCullough.

#### **PHIL 301 ANCIENT AND MEDIEVAL PHILOSOPHY (3)**

Topics in the history of philosophy from the 4th century B.C. through the 14th century. Cross-listed with CLAS 301, MDST 301. Repeatable for Credit. Offered Fall. Instructor(s): Morrison.

#### **PHIL 302 MODERN PHILOSOPHY (3)**

Examination of themes or authors in 17th- and 18th-century philosophy. Topics vary from year to year. Repeatable for credit with consent of instructor. Normally offered every year. Recommended for majors that PHIL 202 be taken before PHIL 302. For non-majors one previous course in philosophy is recommended. Repeatable for Credit. Offered Fall. Instructor(s): Kulstad.

**PHIL 303 THEORY OF KNOWLEDGE (3)**

Topics: analysis of knowledge, foundations of knowledge, skepticism, perception, etc. Offered Fall. Instructor(s): Fagan.

**PHIL 304 METAPHYSICS (3)**

Examination of metaphysical theories in the works of historical and contemporary thinkers. Topics may include: free will, the identity of persons over time, causation, possibility and necessity, design and chance, the nature of existence, the nature of time. Recommended prerequisite(s): A previous course in philosophy. Offered Fall. URL: [www.owl.net.rice.edu/~phil304](http://www.owl.net.rice.edu/~phil304). Instructor(s): Grandy.

**PHIL 305 MATHEMATICAL LOGIC (3)**

We study formal languages and methods for assessing correctness of arguments, including a brief look at modal and many-valued logics. We also consider their relations to natural languages and reflect on the techniques required to prove theorems about languages. A previous logic course is helpful, though the course is self-contained. Graduate/Undergraduate version: PHIL 505. Offered Fall. URL: [www.owl.net.rice.edu/~phil305](http://www.owl.net.rice.edu/~phil305). Instructor(s): Grandy.

**PHIL 306 ETHICS (3)**

This course deals with fundamental questions of value and morality-questions such as: What sort of life is best? What kind of person is it best to be? What does morality require of us? It also deals with important second-order questions about these fundamental questions- for example: Can morality be justified? How can we know what is right or good? Is there moral truth? What is the relation between morality and self-interest? Readings are drawn from both classical and contemporary sources. Offered Spring. Instructor(s): Sheinman; Sher.

**PHIL 307 SOCIAL AND POLITICAL PHILOSOPHY (3)**

What makes a society just? On what grounds may the liberty of individuals be legitimately limited? What social ends may a state legitimately pursue? Offered Fall. Instructor(s): Sheinman; Sher.

**PHIL 308 CONTINENTAL PHILOSOPHY (3)**

An examination of philosophical movements in 20th-century European philosophy-including phenomenology, existentialism, hermeneutics, critical theory, deconstruction, and postmodernism. Repeatable for credit with consent of instructor. Graduate/Undergraduate version: PHIL 508. Repeatable for Credit. Instructor(s): Crowell.

**PHIL 309 AESTHETICS (3)**

An introduction to the philosophy of art drawing upon traditional and contemporary philosophical theories, artist's manifestos, and reflection upon exemplary art works. Topics include: What is a work of art? What is artistic genius? What makes an artwork good? What is the place of art within morality and society. Recommended prerequisite(s): A previous course in philosophy. Instructor(s): Crowell.

**PHIL 311 PHILOSOPHY OF RELIGION (3)**

Examination of God's existence, the problem of evil, the relation between faith and reason, and the varieties of religious experience. Offered Spring. Instructor(s): Brody.

**PHIL 312 PHILOSOPHY OF MIND (3)**

Inquiry into the nature of mind, with emphasis on the mind/body problem. Recommended-Prerequisite(s): One course in philosophy or permission of the instructor. Offered Spring.

**PHIL 313 PHILOSOPHY OF SCIENCE (3)**

This course will focus on the concepts of law and design in biology, relating debates within the life sciences to core problems in philosophy of science. We will examine the role of scientific laws in biology, and the relation between law and design in biological theories, explanations, and experiments. Readings will include key primary sources (e.g. Aristotle, Darwin, Mendel, Burnet) as well as contemporary literature in philosophy of biology. Offered Spring. Instructor(s): Fagan.

**PHIL 314 THE PHILOSOPHY OF MEDICINE (3)**

The biomedical sciences, the practice of medicine, and health care policy employ concepts of health, disease, disability, and defect in explanatory accounts, intermixing factual claims with moral and other evaluations. This course explores the interplay of evaluation and explanation in medicine's models of disease and health. Not offered this academic year. Instructor(s): Engelhardt.

**PHIL 315 ETHICS, MEDICINE, AND PUBLIC POLICY (3)**

The relationship between theories of justice and accounts of the proper allocation of health care is explored. The first half examines Rawls' "Theory of Justice", Nozick's "Anarchy, State, and Utopia", and particular accounts of justice and health care. The second addresses specific problems in the allocation of health care resources. Offered Spring. Instructor(s): Englehardt.

**PHIL 316 PHILOSOPHY OF LAW (3)**

Examination of social control of private property, compensation in the law of torts, the right to privacy and bodily integrity, and justice through compensatory discrimination, etc. Offered Spring. Instructor(s): Sheinman.

**PHIL 317 ETHICS AND EXISTENCE (3)**

An examination of the concept of ethical obligation from an existential point of view. Readings from Kierkegaard, Husserl, Heidegger, Sartre, Derrida, Levinas, and Apel. Offered Spring. Instructor(s): Crowell.

**PHIL 319 FEMINIST PHILOSOPHY (3)**

This course is an introduction to feminist philosophy, including texts by both historical and contemporary thinkers (e.g. Wollstonecraft, Mill, de Beauvoir, MacKinnon, Gilligan, Irigaray). We shall discuss both feminists' radical critiques of traditional values and beliefs, and feminist alternative views of justice, ethical judgment, and truth. Cross-listed with SWGS 339.

**PHIL 321 KANT AND 19TH CENTURY PHILOSOPHY (3)**

An examination of Kant's philosophical revolution in his Critique of Pure Reason, and of the development and criticism of conceptions of self-consciousness, autonomy, sociality, and history in the later post-Kantian philosophical tradition, which may include works by Hegel, Schopenhauer, Marx, Kierkegaard, Nietzsche, or others. Recommended prerequisite(s): One previous course in philosophy.

**PHIL 322 REASON AND FAITH: PHILOSOPHY OF ENLIGHTENMENT (3)**

This course will study the core texts from the European Enlightenment traditions (British, French, and German). Our goal will be to investigate the Enlightenment doctrines concerning the nature of reason and rationality, and the varying engagements—from conciliatory to antagonistic of the defenders of reason with faith and organized religions. Cross-listed with ENGL 334. Not offered this academic year.

**PHIL 326 HISTORY OF ETHICS (3)**

An introduction to the major issues of ethical theory through the reading and discussion of such classical figures as Plato, Aristotle, the Stoics, the Epicureans, St. Augustine, St. Thomas, Maimonides, Bishop Butler, David Hume, Adam Smith, J.S. Mill, and I. Kant.

**PHIL 327 HISTORY OF SOCIAL AND POLITICAL PHILOSOPHY (3)**

A survey of classic texts in the history of social and political philosophy, from Plato to Machiavelli to Mill. Offered Spring. Instructor(s): Morrison.

**PHIL 331 MORAL PSYCHOLOGY (3)**

An examination of the role of intellect, emotion, and character as they contribute to the moral (and immoral) life, and as they pertain to rationality and moral responsibility. Not offered this academic year. Instructor(s): Sher.

**PHIL 332 ANIMAL RIGHTS (3)**

Is it wrong to breed animals for food and experimentation? Do we have a moral obligation to eliminate meat from our diets and leather from our wardrobes? Do non-human animals have rights? This course will explore these questions.

**PHIL 333 CONSEQUENTIALISM (3)**

This course focuses on the debate between the two currently dominant approaches to ethical theory consequentialism, whose best known version is utilitarianism, and deontology, as defended by such philosophers as Kant, Ross, Nagel, and Thomson. Offered Spring.

**PHIL 335 ADVANCED TOPICS IN VALUE THEORY (3)**

Intensive examination of a topic of contemporary or historical interest in ethics or social and political philosophy. Recommended prerequisite(s): One course in philosophy or permission of the instructor.

**PHIL 336 MEDICAL ETHICS (3)**

A philosophical examination of some of the fundamental issues in clinical ethics, including informed consent, competency, confidentiality, end of life decision making, the definition of death, allocating scarce medical resources, and the role of economic analysis in clinical decision making. Readings drawn from the clinical and philosophical literature. Graduate/Undergraduate version: PHIL 536. Offered Fall. Instructor(s): Brody.

**PHIL 337 RESEARCH ETHICS (3)**

A philosophical and ethical examination of some of the major issues related to research on human and animal subjects. A general framework will be introduced and it will be applied to research on new technologies, research on special populations, and research in an international setting. Limited enrollment. Instructor(s): Brody.

**PHIL 342 GENDER, RACE, AND TECHNOSCIENCE (3)**

This upper-level discussion-style seminar explores the influences of science, medicine, and technology to the conceptual formations and lived experiences of race, sex, and gender. Readings will be interdisciplinary with a heavy focus on historical and feminist science, medicine, and technology studies. Each participant will make one presentation and lead one discussion. Cross-listed with SWGS 342. Instructor(s): Koay.

**PHIL 353 PHILOSOPHY OF LANGUAGE (3)**

Philosophical investigation of relations among language, thought, and reality. Recommended prerequisite(s): One course in philosophy or permission of the instructor. Offered Spring.

**PHIL 355 PHILOSOPHICAL TOPICS IN ADVANCED LOGIC (3)**

Various systems of formalization for modalities, tenses and other intentional concepts are studied syntactically and semantically. Students use and compare these systems and evaluate their strengths and limits. These provide examples for discussion of questions such as: What is a logical constant? What is the scope of logic? Pre-requisite(s): PHIL 305 or PHIL 505. URL: [www.owl.net.rice.edu/~phil355](http://www.owl.net.rice.edu/~phil355). Instructor(s): Grandy.

**PHIL 357 INCOMPLETENESS, UNDECIDABILITY, AND COMPUTABILITY (3)**

Proof of Godel's Incompleteness Theorems for number theory in several forms and by various methods, as well as development of several definitions of computability for number-theoretic functions, which are then shown to be equivalent. Includes proof of the unsolvability of the Halting Problem and analysis of Church's thesis, as well as exploration of the extension of the concept of computability to real-valued functions. Not offered this academic year. URL: [www.owl.net.rice.edu/~phil357](http://www.owl.net.rice.edu/~phil357). Instructor(s): Grandy.

**PHIL 390 TOPICS IN PHILOSOPHY (3)**

Topics may vary. Please consult with department for additional information. Repeatable for credit with consent of the instructor. Repeatable for Credit.

**PHIL 401 INDEPENDENT READING I (3)**

Course for undergraduate students to pursue independent research projects under direction of a philosophy department faculty member. Instructor permission required. Repeatable for Credit. Offered Fall.

**PHIL 402 INDEPENDENT READING II (3)**

See PHIL 401. Instructor permission required. Repeatable for Credit. Offered Spring.

**PHIL 411 HONORS (3)**

Independent research course for undergraduate philosophy majors who wish to receive honors in the major. Students may enroll in PHIL 411 only with consent of a faculty advisor and the department, and only if they intend to enroll in PHIL 412 as well. Honors are a year-long research course. Instructor permission required. Offered Fall. Instructor(s): Crowell.

**PHIL 412 HONORS (3)**

Independent research course for undergraduate philosophy majors who wish to receive honors in the major. Students may enroll in PHIL 412 only with consent of a faculty advisor and the department, and only if they intend to enroll in PHIL 411 as well. Honors are a year-long research course. Instructor permission required. Offered Spring. Instructor(s): Crowell.

**PHIL 501 SEMINAR IN ANCIENT AND MEDIEVAL PHILOSOPHY (3)**

Graduate/Undergraduate version: MDST 481. Offered Spring. Instructor(s): Morrison.

**PHIL 502 SEMINAR IN MODERN PHILOSOPHY (3)**

Graduate level examination of topics and figures of 17th and 18th century history of philosophy. Topics vary from year to year. Repeatable for credit with the consent of the instructor. Repeatable for Credit. Offered Fall. Instructor(s): Kulstad.

**PHIL 503 SEMINAR IN EPISTEMOLOGY (3)**

Instructor(s): Fagan.

**PHIL 504 SEMINAR IN METAPHYSICS (3)**

Instructor(s): Grandy.

**PHIL 505 MATHEMATICAL LOGIC (3)**

A version of PHIL 305 for philosophy graduate students. Graduate/Undergraduate version: PHIL 305. Offered Fall. URL: [www.owl.net.rice.edu/~phil305](http://www.owl.net.rice.edu/~phil305). Instructor(s): Grandy.

**PHIL 506 SEMINAR IN ETHICS (3)**

Instructor(s): Sher.

**PHIL 507 SEMINAR IN SOCIAL AND POLITICAL PHILOSOPHY (3)**

Instructor(s): Sher.

**PHIL 508 SEMINAR IN CONTINENTAL PHILOSOPHY (3)**

The study of selected topics and figures in 20th century European philosophy. Repeatable for credit with consent of the instructor. Graduate/Undergraduate version: PHIL 308. Repeatable for Credit. Offered Fall. Instructor(s): Crowell.

**PHIL 509 SEMINAR IN AESTHETICS (3)**

A focused seminar on one aspect of aesthetics, either topical or historical; to include, e.g., the 18th century theories of taste, beauty and the sublime, environmental aesthetics, or the nature of artistic expression. Repeatable for credit with consent of the instructor. Repeatable for Credit. Instructor(s): Crowell.

**PHIL 512 SEMINAR PHILOSOPHY OF MIND (3)**

Offered Fall.

**PHIL 513 SEMINAR IN PHILOSOPHY OF SCIENCE (3)**

Focused consideration of either topics of perennial interest (e.g. explanation, experiment, the problem of induction, confirmation, the measurement problem of quantum mechanics, interpretation of probability, realism vs. anti-realism, the role of values in science) or topics currently popular in the field. Offered Spring. Instructor(s): Fagan.

**PHIL 516 SEMINAR IN PHILOSOPHY OF LAW (3)**

The seminar will concentrate on one or more of such central topics in the philosophy of law as the normative foundations of contracts, criminal responsibility, the debate over legal positivism, theories of corrective justice, and the duty to obey the law. Offered Spring. Instructor(s): Sheinman.

**PHIL 522 TOPICS IN MODERN PHILOSOPHY (3)**

Topics in early modern philosophy: a focused, more advanced seminar on select problems or figures in the 17th and 18th centuries. Repeatable for credit with consent of the instructor. Repeatable for Credit. Instructor(s): Kulstad.

**PHIL 523 SEMINAR IN KANT (3)**

Offered Fall. Instructor(s): Engelhardt.

**PHIL 524 SEMINAR IN HEGEL (3)**

Offered Fall. Instructor(s): Engelhardt.

**PHIL 525 SEMINAR IN 19TH CENTURY PHILOSOPHY (3)**

An in-depth investigation of a central philosophical movement (e.g. romanticism, German idealism) and/or of the works of one or more central philosophers in the 19th century, to include, e.g., Nietzsche, Schopenhauer, Marx, Kierkegaard, Schelling, and Fichte. Repeatable for credit with consent of the instructor. Repeatable for Credit.

**PHIL 530 SEMINAR IN HISTORY OF ANALYTIC PHILOSOPHY (3)**

Offered Spring. URL: [www.owl.net.rice.edu/~phil530](http://www.owl.net.rice.edu/~phil530). Instructor(s): Grandy.

**PHIL 532 SEMINAR IN METAETHICS (3)**

Offered Fall.

**PHIL 533 CONSEQUENTIALISM (3)**

The leading question of virtue ethics has been characterized as: "What kind of person is it best to be?" Topics to be discussed may include moral worth, virtues and vices, and feminist ethics.

**PHIL 534 LIBERALISM (3)**

An examination of the theoretical foundations of liberalism, with emphasis on the thesis that government should be neutral toward competing conceptions of the good life. Course offered alternate years. Offered Spring. Instructor(s): Sher.

**PHIL 535 ADVANCED TOPICS IN VALUE THEORY (3)**

Intensive examination of a topic of contemporary or historical interest in ethics or social and political philosophy.

**PHIL 536 SEMINAR IN MEDICAL ETHICS (3)**

An examination of the theoretical foundations of bioethics emphasizing principlism, utilitarianism, Kantianism, contractarianism, medicalism, post-modernism, and casuistry. Graduate/Undergraduate version: PHIL 336. Offered Fall. Instructor(s): Brody.

**PHIL 537 SEMINAR IN RESEARCH ETHICS (3)**

An examination of the major issues of research ethics, including informed consent and IRB review, involvement and protection of special groups of subjects, fetal tissue and stem cell research, and genetic research. Instructor(s): Brody.

**PHIL 542 TOPICS IN PHILOSOPHY OF MIND (3)**

An in-depth look at different topics in contemporary philosophy of mind. Some sample topics: consciousness, mental representation, innateness, modularity, and the role of language in thought. Repeatable for credit with consent of the instructor. Repeatable for Credit.

**PHIL 553 SEMINAR IN PHILOSOPHY OF LANGUAGE (3)**

Instructor(s): Grandy.

**PHIL 590 TOPICS IN PHILOSOPHY (3)**

Topics may vary: Please consult with the department for additional information. Repeatable for Credit. Offered Spring. Instructor(s): Sher.

**PHIL 598 ADVANCED INDEPENDENT READING (3)**

Directed reading and research. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall. Instructor(s): Crowell.

**PHIL 599 ADVANCED INDEPENDENT READING (1 TO 6)**

Directed reading and research. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Spring. Instructor(s): Crowell.

**PHIL 601 RESEARCH PAPER (3)**

Research course normally for second-year graduate students completing research paper requirement. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Offered Fall. Instructor(s): Crowell.

**PHIL 602 RESEARCH PAPER (3)**

Research course normally for second year graduate students completing research paper requirement. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Offered Spring. Instructor(s): Crowell.

**PHIL 651 MASTERS THESIS RESEARCH (1 TO 15)**

Research course for graduate students preparing a masters thesis. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall. Instructor(s): Crowell.

**PHIL 652 MASTERS THESIS RESEARCH (1 TO 15)**

Research course for graduate students preparing a Masters thesis. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Spring. Instructor(s): Crowell.

**PHIL 701 READING AND RESEARCH FOR QUALIFYING EXAMINATION AND THESIS PROPOSAL (1 TO 15)**

Reading course in preparation for the comprehensive examination and thesis proposal defense. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall. Instructor(s): Crowell.

**PHIL 702 READING AND RESEARCH FOR QUALIFYING EXAMINATION AND THESIS PROPOSAL (1 TO 15)**

Reading course in preparation for the comprehensive examination and thesis proposal defense. Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Spring. Instructor(s): Crowell.

**PHIL 757 TEACHING WORKSHOP (2)**

A highly participatory workshop for graduate students to improve their teaching abilities. Instructor(s): Grandy.

**PHIL 758 RESEARCH AND WRITING WORKSHOP (1)**

A participatory practical workshop for graduate students to learn about professional aspects of work in philosophy, including research methods and writing for publication and conferences. Department permission required. Offered Fall.

**PHIL 800 RESEARCH AND THESIS (1 TO 15)**

Must be enrolled in one of the following Major(s): Philosophy. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Crowell.

**PHYS (PHYSICS)****School of Natural Sciences/Physics and Astronomy****PHYS 101 MECHANICS (WITH LAB) (3)**

Calculus-based survey of physics. Includes classes and lab exercises on topics chosen from mechanics, electricity, and magnetism. Primarily for physical science and engineering students. May receive credit for only one of PHYS 101, 111, 125, AP Physics-B, and AP Physics-C (MECH).

**PHYS 102 ELECTRICITY & MAGNETISM (WITH LAB) (4)**

Continuation of PHYS 101. May receive credit for only one of PHYS 102, 112, 126, AP Physics-B, and AP Physics-C (E&M).

**PHYS 111 MECHANICS (WITH LAB) (3)**

Calculus-based survey of physics. Includes classes and lab exercises on topics chosen from mechanics, electricity, and magnetism. Primarily for physical science and engineering students with strong high school backgrounds in physics. May receive credit for only one of PHYS 101, 111, 125, AP Physics-B, and AP Physics-C (MECH).

**PHYS 112 ELECTRICITY & MAGNETISM (WITH LAB) (4)**

Continuation of PHYS 111. May receive credit for only one of PHYS 102, 112, 126, AP Physics-B, and AP Physics-C (E&M).

**PHYS 125 GENERAL PHYSICS (WITH LAB) (4)**

Calculus-based survey of physics. Includes classes and lab exercises on topics chosen from mechanics, waves, electricity, magnetism, optics, and modern physics. Primarily for bioscience and premedical students. May receive credit for only one of PHYS 101, 111, 125, AP Physics-B, and AP Physics-C (MECH).

**PHYS 126 GENERAL PHYSICS II (WITH LAB) (4)**

A continuation of PHYS 125. May receive credit for only one of PHYS 102, 112, 126, AP Physics B, and AP Physics-C (E&M). Pre-requisite(s): PHYS 125.

**PHYS 141 CONCEPTS IN PHYSICS I (3)**

Study of concepts in physics with emphasis on the nature of physical phenomena, the conceptual development of physics, and related cultural influences.

**PHYS 142 CONCEPTS IN PHYSICS II (3)**

For AP credit only.

**PHYS 201 WAVES AND OPTICS (3)**

Fundamentals of oscillations and waves and properties of electromagnetic waves. Basic principles of geometric optics, interference and diffraction, including Fourier methods.

**PHYS 202 MODERN PHYSICS (3)**

An introductory course in modern physics. Topics include special relativity, early quantum theory, quantum mechanics, atomic physics, statistical physics, nuclear and particle physics. The course is descriptive in nature with emphasis on phenomena rather than on calculations. Pre-requisite(s): PHYS 101 or PHYS 111 and PHYS 102 or PHYS 112.

**PHYS 231 ELEMENTARY PHYSICS LAB (1)**

Laboratory on waves and optics.

**PHYS 301 INTERMEDIATE MECHANICS (4)**

Classical mechanics and appropriate mathematical methods. Emphasis on problem solving. Prerequisite(s): PHYS 201.

**PHYS 302 INTERMEDIATE ELECTRODYNAMICS (4)**

Classical electrodynamics and appropriate mathematical methods. Emphasis on problem solving. Prerequisite(s): PHYS 201.

**PHYS 311 INTRODUCTION TO QUANTUM PHYSICS I (3)**

Fundamentals of quantum mechanics and applications to atomic and molecular structure. Prerequisite(s): PHYS 202.

**PHYS 312 INTRODUCTION TO QUANTUM PHYSICS II (3)**

Continuation of PHYS 311.

**PHYS 331 JUNIOR PHYSICS LAB I (2)**

Lab exercises in electronics, noise reduction, statistics and particle counting.

**PHYS 332 JUNIOR PHYSICS LAB II (2)**

Lab exercises illustrating topics in the upper-division physics curriculum.

**PHYS 357 ATMOSPHERE, WEATHER, AND CLIMATE (3)**

Following an overview of atmospheric science, we will examine the following topics: atmospheric thermodynamics, radiative transfer, cloud microphysics, atmospheric dynamics, severe weather, and climate dynamics. Weather systems and forecasting are incorporated by a weather briefing at the beginning of each class.

**PHYS 401 PHYSICS OF HAM RADIO (3)**

Amateur radio for middle-school science teaching. Fundamentals of electromagnetic waves and propagation, the ionosphere and space weather. Basic electronics, antenna design and safety. Provides information necessary to gain the technical level of ham radio license.

**PHYS 411 INTRODUCTION TO NUCLEAR & PARTICLE PHYSICS (3)**

A broad survey of history and current state of nuclear and particle physics. The emphasis is on experimental results and how they led to our current undertaking of the strong and electroweak interactions. Some recent advances are discussed in detail. Graduate/Undergraduate version: PHYS 542. Pre-requisite(s): PHYS 311.

**PHYS 412 SOLID STATE PHYSICS (3)**

Introduction to topics in solid state physics, including crystal structure, lattice vibrations, electronic band structure and transport.

**PHYS 416 COMPUTATIONAL PHYSICS (3)**

Use of computational techniques to solve selected physics problems. Examine benefits and pitfalls of doing physics by computation.

**PHYS 425 STATISTICAL & THERMAL PHYSICS (3)**

Includes classical thermodynamics; classical & quantum statistical mechanics; Fermi, Bose, and classical gases; magnetic systems; and phase equilibria.

**PHYS 461 INDEPENDENT RESEARCH (1 TO 6)**

A reading course in special topics. Repeatable for Credit.

**PHYS 462 INDEPENDENT RESEARCH (1 TO 6)**

A reading course in special topics. Repeatable for Credit.

**PHYS 465 REU RESEARCH IN PHYSICS AND ASTRONOMY (1 TO 3)**

Repeatable for Credit.

**PHYS 480 INTRODUCTION TO PLASMA PHYSICS (3)**

Fundamental processes in cosmic and laboratory plasmas: gas dynamics, kinetic theory, magneto-hydrodynamics, wave and shocks, individual particle drifts, collisions and electrical conductivities, geometric and distribution instabilities. Pre-requisite(s): PHYS 302.

**PHYS 491 UNDERGRADUATE RESEARCH (2)**

Research projects conducted under supervision of departmentally approved faculty. Open to juniors and seniors majoring in physics and astronomy. May be repeated for credit. PHYS 493/494 must be taken concurrently with PHYS 491/492 when used in partial fulfillment of B.S. degree requirements. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics, Chemical Physics, Physics. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit.

**PHYS 492 UNDERGRADUATE RESEARCH (2)**

Research projects conducted under supervision of departmentally approved faculty. Open to juniors and seniors majoring in physics and astronomy. May be repeated for credit. PHYS 493/494 must be taken concurrently with PHYS 491/492 when used in partial fulfillment of B.S. degree requirements. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics, Chemical Physics, Physics. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit.



**PHYS 493 UNDERGRADUATE RESEARCH SEMINAR (1)**

Weekly seminar for juniors and seniors in which presentations on research topics and/or topics in the scientific literature will be given. Open to juniors and seniors majoring in physics and astronomy. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics, Chemical Physics, Physics. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit.

**PHYS 494 UNDERGRADUATE RESEARCH SEMINAR (1)**

Weekly seminar for juniors and seniors in which presentations on research topics and/or topics in the scientific literature will be given. Open to juniors and seniors majoring in physics and astronomy. Must be enrolled in one of the following Major(s): Astronomy, Astrophysics, Chemical Physics, Physics. Must be in one of the following Classification(s): Junior, Senior. Repeatable for Credit.

**PHYS 510 MAGNETOSPHERIC PHYSICS (3)**

Plasma physics of the earth's magnetosphere, including interactions of the magnetosphere with the solar wind and the ionosphere. The emphasis is on large-scale phenomenon, but small scale (kinetic) physics is discussed in cases where it affects the large-scale phenomena.

**PHYS 515 CLASSICAL DYNAMICS (3)**

Lagrangian and Hamiltonian mechanics.

**PHYS 516 MATHEMATICAL METHODS (3)**

Survey of analytical methods used by research physicists and astronomers. Includes complex variables, ordinary differential equations, infinite series, evaluation of integrals, integral transforms, normal-mode analysis, special functions, partial differential equations, eigenfunctions, Green's functions, and variational calculus.

**PHYS 519 PLASMA KINETIC THEORY (3)**

Plasma kinetic equations (Klimontovich, Liouville, BBGKY, Balescu-Lenard, Fokker-Planck, Vlasov), Vlasov theory of waves and instabilities, connections to fluid plasma models.

**PHYS 521 QUANTUM MECHANICS I (3)**

Graduate level course on non-relativistic quantum mechanics. Topics include early quantum theory, one-dimensional systems, matrix formulation, quantum dynamics, symmetries and conservation laws, bound states, scattering, spin, and identical particles, perturbation theory.

**PHYS 522 QUANTUM MECHANICS II (3)**

Continuation of PHYS 521.

**PHYS 526 STATISTICAL PHYSICS (3)**

Selected topics in statistical mechanics, including phase transitions and transport phenomena.

**PHYS 532 CLASSICAL ELECTRODYNAMICS (3)**

Maxwell's equations, wave propagation, special relativity and covariant formulation, charged-particle dynamics, and radiation.

**PHYS 533 NANOSTRUCTURE AND NANOTECHNOLOGY I (3)**

Physics of structures and devices at the nanometer scale. After a review of solid state physics, topics include nanostructured materials, nanoelectronics, and nanomagnetism. Emphasis on relevance of nanophysics to current and future technologies.

**PHYS 534 NANOSTRUCTURE AND NANOTECHNOLOGY II (3)**

Physics of structures and devices at the nanometer scale. Topics include nanomechanics, bionanotechnology, advanced sensors and photonics. Continuation of PHYS 533.

**PHYS 535 CRYSTALLOGRAPHY AND DIFFRACTION (3)**

Study of crystals by x-ray, electron and neutron diffraction. Includes basic diffraction theory as well as methods for characterizing the structure, composition and stresses in crystalline materials. Required for undergraduate materials science and engineering majors. Cross-listed with MSCI 535.

**PHYS 537 METHODS OF EXPERIMENTAL PHYSICS I (4)**

This two-semester course will familiarize students with basic experimental techniques that are common to all academic and industrial research laboratories. Topics will include lab safety, mechanical design, computer-based data acquisition and experimental control, laboratory electronics, vacuum technology, optics, thermal measurement and control, cryogenics and charged particle optics.

**PHYS 538 METHODS OF EXPERIMENTAL PHYSICS II (4)**

Continuation of PHYS 537.

**PHYS 539 CHARACTERIZATION AND FABRICATION AT THE NANOSCALE (3)**

Introduction to study and creation of nanoscale structures, emphasizing relevant physical principles. Techniques covered include optical, X-ray, electron-based and scanned-probe characterization, as well as patterning, deposition and removal of material.

**PHYS 541 RADIATIVE PROCESSES (3)**

Radiation processes and their applications to astrophysical phenomena and space science. The course treats radiative transfer, radiation from moving charges, relativistic covariance and kinematics, bremsstrahlung, synchrotron radiation, Compton scattering, some plasma effects, and radiative transitions in atoms and molecules.

**PHYS 542 INTRODUCTION TO NUCLEAR AND PARTICLE PHYSICS (3)**

Graduate/Undergraduate version: PHYS 411.

**PHYS 543 PHYSICS OF QUARKS AND LEPTONS (3)**

A continuation of PHYS 542.

**PHYS 551 BIOLOGICAL PHYSICS (3)**

Introduction to biological physics. Review of basic physical concepts. Cells and their components. Diffusion and random walks. Entropy and energy concepts and their roles in biological systems. Modern experimental methods. Applications to biological macromolecules.

**PHYS 552 MOLECULAR BIOPHYSICS (3)**

This is an introductory course for physical sciences graduate students who have not taken college-level biology courses. We will examine biological systems such as DNA, proteins and membranes, first by giving a thorough description of their biological functions and then by analyzing their underlying physical principles.

**PHYS 561 GENERAL RELATIVITY (3)**

Study of Einstein's theory of gravitation, including cosmological models. Pre-requisite(s): PHYS 532.

**PHYS 563 INTRODUCTION TO SOLID STATE PHYSICS I (3)**

Fundamental concepts of crystalline solids, including crystal structure, band theory of electrons, and lattice vibration theory. Cross-listed with ELEC 563.

**PHYS 564 INTRODUCTION TO SOLID STATE PHYSICS II (3)**

Continuation of PHYS 563, including scattering of waves by crystals, transport theory, and magnetic phenomena. Cross-listed with ELEC 564.

**PHYS 566 SURFACE PHYSICS (3)**

An introduction to surface- and low-dimensional physics covering experimental surface physics and ultrahigh vacuum technology, crystal structure, chemical analysis, epitaxy, nanoscale electronic and magnetic structures and devices, elementary excitations, optical properties and nanoscale sensitive magnetic and non-magnetic spectroscopies.

**PHYS 568 QUANTUM PHASE TRANSITIONS (3)**

Introductory course for graduate students. Topics include the concepts of classical and quantum phase transitions, mean field theory, renormalization group and quantum phase transitions in magnetic, fermionic, and bosonic systems.

**PHYS 569 ULTRAFAST OPTICAL PHENOMENA (3)**

Cross-listed with ELEC 569.

**PHYS 571 MODERN ATOMIC PHYSICS (3)**

This is an introductory course at the graduate level. Topics to be discussed include: atomic structure, principles of lasers, fundamental interactions of atoms with electro-magnetic radiation, including coherent effects, laser spectroscopy, quantum optics, and laser cooling and trapping of atoms, and Bose-Einstein condensation.

**PHYS 572 FUNDAMENTALS OF QUANTUM OPTICS (3)**

Discussion of quantization and statistical properties of light fields; interaction between atoms and light; non-classical states; basic laser theory; quantum effects of nonlinear optics; introduction to atom optics.

**PHYS 600 ADVANCED TOPICS IN PHYSICS (3)**

Lecture/seminars, which treat topics of departmental interest. Repeatable for Credit.

**PHYS 605 COMPUTATIONAL ELECTRODYNAMICS AND NANOPHOTONICS (3)**

This course covers computational and numerical methods for calculating electromagnetic fields and propagation in complex geometries on the nano and microscale. Methods include the finite difference time domain method, boundary element methods, Greens functions methods, finite element methods, the discrete dipole approximation and relaxation methods. Cross-listed with ELEC 605. Repeatable for Credit.

**PHYS 610 BIOLOGICAL AND MOLECULAR SIMULATION (3)**

Modern simulation techniques for classical atomistic systems. Monte Carlo and molecular dynamic techniques, with extensions to various ensembles. Applications to simulations of large molecules. Advanced techniques for simulation of complex systems, including constraint satisfaction, cluster movies, biased sampling and random energy models. Cross-listed with BIOE 610. Pre-requisite(s): PHYS 526 or CHEM 520 or BIOE 589 or CHBE 611 or permission of instructor.

**PHYS 622 QUANTUM FIELD THEORY (3)**

An introduction to relativistic quantum field theory. Topics include: quantization of scalar, spinor, and vector fields; Feynman diagrams; gauge theories, including QED and QCD; renormalization; and functional-integral methods.

**PHYS 643 MECHANICAL AND THERMODYNAMIC PROPERTIES OF BIOMEMBRANES (3)**

The mechanical properties of membranes influence several biological processes including endocytosis, fusion, signaling and cellular differentiation. This course will cover the theoretical foundations of membrane mechanics, examine experimental methods for measuring membrane material properties, including nanomechanical and optical techniques, and emphasize the importance of membrane mechanics in bioengineering applications. Cross-listed with BIOS 643. Instructor permission required. Instructor(s): Raphael.

**PHYS 663 CONDENSED MATTER THEORY: APPLICATIONS (3)**

Applications of techniques developed in PHYS 664.

**PHYS 664 CONDENSED MATTER THEORY: MANY-BODY FORMALISM (3)**

Formal structure of many-body theory as used in condensed matter physics.

**PHYS 700 TEACHING PRACTICUM (3)**

Supervised teaching for graduate students. Repeatable for Credit.

**PHYS 800 GRADUATE RESEARCH (1 TO 15)**

Thesis research under the supervision of department faculty. Repeatable for Credit.

**PLSH (POLISH)****School of Humanities/Center for Study of Languages****PLSH 101 INTRODUCTION TO POLISH LANGUAGE AND CULTURE I (5)**

Emphasis on speaking and reading. A selection of textbooks and other materials (audio, video, Internet) are used in this beginners' course in the language of Polanski and the Pope. Recommended prerequisite(s): No prior knowledge of Polish. Limited enrollment.

**PLSH 102 INTRODUCTION TO POLISH LANGUAGE AND CULTURE II (5)**

Continuation of PLSH 101. Introductory study of Polish with emphasis on speaking and reading. A selection of textbooks and other materials (audio, video, Internet) are used in this beginners' course in the language of Polanski and the Pope. Pre-requisite(s): PLSH 101 or permission of instructor.

**POLI (POLITICAL SCIENCE)****School of Social Sciences/Political Science****POLI 110 AP CREDIT IN AMERICAN GOVERNMENT (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**POLI 112 AP CREDIT IN COMPARATIVE GOVERNMENT (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**POLI 209 INTRODUCTION TO CONSTITUTIONALISM AND MODERN POLITICAL THOUGHT (3)**

Study of constitutionalism and authoritarianism from Machiavelli to Marx. Includes an introduction to contemporary ideologies. With POLI 210 meets state professional requirements for teachers. Limited enrollment.

**POLI 210 AMERICAN GOVERNMENT AND POLITICS (3)**

Major topics in American politics: public opinion, group politics, political parties, elections, congressional-presidential-bureaucratic politics, and judicial politics. Together with POLI 209 meets state professional requirements for teachers. Limited enrollment.

**POLI 211 INTRODUCTION TO INTERNATIONAL RELATIONS (3)**

An introduction to the study of international relations. The course examines topics from the role of individuals to the impact of the international system. Major issues, such as the causes of war and problems of development in the Third World are also discussed. Limited enrollment.

**POLI 212 INTRODUCTION TO COMPARATIVE POLITICS (3)**

An examination of political institutions and behavior in selected democratic, communist, and Third World countries. Limited enrollment.

- POLI 250 INTERNATIONAL POLITICAL ECONOMY OF GENDER (3)**  
This course explores the relationship between women's lives, gender ideologies, and international and domestic politics and economics. We will examine women's experiences with and resistance to the sexual division of labor, imperialism, capitalism, consumerism, domestic service, war, slavery, and migration across different geographical and historical contexts. Cross-listed with SWGS 250.
- POLI 300 FEDERALISM AND INTERGOVERNMENTAL POLITICS (3)**  
An exploration of the politics, demographics, technology, and legal environment of twenty-first century legislative redistricting. In addition to lectures and readings, the course includes an introduction to a computer based geographical information system that the students will use to complete a redistricting simulation. Limited enrollment.
- POLI 301 STATE POLITICS (3)**  
This course is organized around the themes of the constraints and influences on the adoption and implementation of public policies in the American states. Limited enrollment.
- POLI 305 DIRECTED READING I (3)**  
Independent reading under the supervision of a member of the department. Open to junior majors in the honors program and to others in special cases with the permission of the instructor. Instructor permission required. Repeatable for Credit.
- POLI 306 DIRECTED READING II (3)**  
See POLI 305. Instructor permission required. Repeatable for Credit.
- POLI 307 POLITICAL SCIENCE INTERNSHIP I (2)**  
This course is the in-class component of the political science internship program. Students will read both a common set of materials and a set that is oriented to their forthcoming internship. A final paper is required. Instructor permission required.
- POLI 308 POLITICAL SCIENCE INTERNSHIP II (1 TO 2)**  
This course is the work component of the political science internship program. Students will be required to submit weekly progress reports and a final portfolio. Pre-requisite(s): POLI 307. Instructor permission required.
- POLI 315 ELECTIONS AND VOTING BEHAVIOR (3)**  
Exploration of voting behavior and elections. Includes consideration of both individual level behavior and aggregate level patterns of election results. Limited enrollment.
- POLI 317 THE CONGRESS (3)**  
Examines the role of Congress in the American political system. Attention is given to the historical development of Congress, the current status of the Congress, and the functions of Congress in the American political system. Limited enrollment.
- POLI 318 THE PRESIDENCY (3)**  
Analysis of presidential powers and behavior in the context of legal, electoral, personal, and other forces that shape and limit the actions of the President. Limited enrollment.
- POLI 321 AMERICAN CONSTITUTIONAL LAW (3)**  
Interpretation of the Constitution by the Supreme Court. (Juniors and Seniors preferred). Limited enrollment.
- POLI 329 HEALTH POLICY (3)**  
Applies an interdisciplinary approach to the study of health policy. Objectives are to provide students with a broad introduction to the healthcare system, identify stresses on the current system, and explore possible public policy decisions that may transform the healthcare system. Limited enrollment.
- POLI 330 MINORITY POLITICS (3)**  
Examination of the political and social position of minority groups (African Americans, Asian Americans, Native Americans, Latinos, and women) in the U.S. This course explores the political power and behavior of these groups. The key concepts include racism, discrimination, resources, political power, culture, leadership, class, and inequality. Limited enrollment.
- POLI 331 ENVIRONMENTAL POLITICS AND POLICY (3)**  
This course considers the major issues in the increasingly important public policy area of the environment. It emphasizes the American experience, but also considers certain crucial international aspects of these issues. Limited enrollment.
- POLI 332 URBAN POLITICS (3)**  
Exploration of issues of political behavior and public policy in urban and metropolitan areas. Includes urban decline, regional governance, revitalization, and issues of ethnic and racial conflict. Limited enrollment.
- POLI 333 COMPARATIVE LEGISLATURES (3)**  
Examination of similarities and differences of legislatures in different countries. Includes the causes and consequences of these differences. Limited enrollment.

**POLI 334 AMERICAN POLITICAL PARTIES (3)**

Examination of the American political party system both historically and contemporarily, with important emphasis on the nomination, campaign, and election functions of political parties. Party organization in government will also be explored. Limited enrollment.

**POLI 335 POLITICAL ENVIRONMENT OF BUSINESS (3)**

Study of the foundation of government involvement in public policy and the institutional process guiding executive, legislative, and bureaucratic officials. Includes theories of collective action and their application in the political world. Limited enrollment.

**POLI 336 POLITICS OF REGULATION (3)**

This course will focus principally on government regulation of business and the political factors that shape its content. Limited enrollment.

**POLI 337 PUBLIC POLICY AND BUREAUCRACY (3)**

Exploration of the role that public bureaucracy plays in national policy making. Includes an examination of sources of agency power, which are linked to different policy outcomes. Limited enrollment.

**POLI 338 POLICY ANALYSIS (3)**

This class familiarizes students with the analytical tools necessary for evaluating and analyzing public policies. Cross-listed with SOSOC 301. Limited enrollment.

**POLI 339 SOUTHERN POLITICS (3)**

Examination of selected political patterns and trends in the modern South. Includes political developments within the region and the impact of the South on American politics generally. Limited enrollment.

**POLI 341 GENDER AND POLITICS (3)**

Examination of politics through the lens of gender hierarchy. Emphasis on how the constructions of masculinity and femininity shape and are shaped by interacting economic, political, and ideological practices. Limited enrollment.

**POLI 342 POLITICS OF THE JUDICIARY (3)**

Explores the role of courts and judges in American politics. Will illustrate major characteristics of judicial institutions in the U.S. and provide understanding of forces influencing judicial decisions. Will cover federal and state organization of trial and appellate courts, judicial selection methods, and the politics of judicial decision-making. Limited enrollment.

**POLI 348 ORGANIZATIONAL DESIGN (3)**

An introduction to the analysis design, and management of organizations with an emphasis on incentives and information. Principles from economics, political science, and game theory will be applied to problems in project and team management, in organizational computing, and in allocating and pricing share facilities. Cross-listed with ECON 348. Limited enrollment.

**POLI 354 LATIN AMERICAN POLITICS (3)**

Study of the political process in contemporary Latin America, with emphasis on selected major countries. Limited enrollment.

**POLI 355 GOVERNMENT AND POLITICS OF THE MIDDLE EAST (3)**

Provides an introduction to politics in the Middle East. Brief historical overview is combined with detailed description of political systems in the area. The region is then used to examine empirically, critique and revise theories of comparative politics. Emphasis on whether the region would be considered unique or exceptional. Limited enrollment.

**POLI 356 THE POLITICS OF LATIN AMERICAN ECONOMIC DEVELOPMENT (3)**

This course examines the evolution of economic development in Latin America, focusing on its political foundations. Special attention will be given to the interaction between economic growth and the construction of democratic political institutions in Latin America. Limited enrollment.

**POLI 357 DEMOCRACY AND DEMOCRATIZATION (3)**

This course will examine the theoretical and practical idea of democracy. It will do so by trying to explore the following questions: What is democracy? How does democracy arise? How may democracy survive and consolidate? Limited enrollment.

**POLI 360 WESTERN EUROPEAN DEMOCRACIES (3)**

A survey of government and politics in Western European democracies, with primary emphasis on Great Britain, France, and Germany. Limited enrollment.

**POLI 362 EUROPEAN INTEGRATION (3)**

Examines the process of European integration since World War II. Special attention is given to the European Community (EC), its institutions and policy processes as well as the consequences of European Unity for the political process in European societies. Limited enrollment.

**POLI 365 BRITISH POLITICS (3)**

An examination of British politics and government, with emphasis on both the contemporary and historical setting. This course also emphasizes a comparison of the British political system with the American political system. Limited enrollment.

**POLI 367 TRANSITIONS TO DEMOCRACY (3)**

This course uses recent examples from East-Central Europe to illustrate a variety of transitions to democracy. Procedures which are vital to a successful transition, such as setting up electoral laws, economic reform, constitution-making, and transitional justice are discussed from an institutional design perspective. Limited enrollment.

**POLI 372 AMERICAN FOREIGN POLICY (3)**

Examination of internal and external aspects of foreign policy leadership, presidential initiative, congressional control, press, public opinion, and crisis management. Not a Managerial Studies elective. Limited enrollment.

**POLI 373 INTERNATIONAL CONFLICT (3)**

Exploration of the theoretical basis of, and empirical evidence for, a number of explanations for interstate war. Includes contemporary theories dealing with dispute escalation, arms races, deterrence, crisis management, and low-intensity conflict. Limited enrollment.

**POLI 374 STRATEGIC INTERACTIONS IN INTERNATIONAL RELATIONS (3)**

Introduction to the uses of game theory in the study of international relations. Limited enrollment.

**POLI 375 INTERNATIONAL ORGANIZATION (3)**

Study of the development and role of international organizations in world politics. Topics include the history and evolution of international organizations, the effects of international law on behavior, and the extent to which international cooperation has been effective at resolving global problems. Limited enrollment.

**POLI 378 POLITICS OF AMERICAN NATIONAL SECURITY (3)**

Examination of major issues of national security policy. Includes strategic doctrines, policy-making processes on defense issues, arms control, and the defense of Europe. Not a Managerial Studies elective. Limited enrollment.

**POLI 379 PROBLEMS IN INTERNATIONAL RELATIONS (3)**

Explores the relationship between politics and economics. The objective is to understand the historical development of trade and monetary relationships between the countries of the world. Pre-requisite(s): POLI 395. Repeatable for Credit. Limited enrollment.

**POLI 380 POLITICAL BEHAVIOR (3)**

Examines basic concepts in political behavior including political socialization, models of voting behavior, public opinion, and political participation. Limited enrollment.

**POLI 395 INTRODUCTION TO STATISTICS (3)**

Introduction to research design and quantitative methods used in contemporary political science research. Students will apply the tools of social science inquiry in a series of projects designed to examine political attitudes and behavior. Limited enrollment.

**POLI 401 STATE POLITICS RESEARCH SEMINAR (3)**

A research seminar in state politics and policy with an emphasis on state institutions. Limited enrollment.

**POLI 405 SENIOR THESIS (3)**

Open to senior honors majors with the permission of the department. Students must complete both POLI 405 and 406 to obtain credit. Instructor permission required. Offered Fall & Spring.

**POLI 406 SENIOR THESIS (3)**

See POLI 405. Instructor permission required. Offered Fall & Spring.

**POLI 418 SEMINAR ON THE PRESIDENCY (3)**

Provides students with a broad introduction to the presidency. Topics include a review of the executive's constitutional powers and their changes over time; processes and politics of presidential nomination and election; struggles between the president and other political elites and dynamics of White House decision-making. Limited enrollment.

**POLI 422 AMERICAN POLITICAL DEVELOPMENT (3)**

Examines the creation and evolution of American political institutions using new institutionalism as a theoretical perspective. New institutionalism focuses on how rules influence the behavior of individuals, having important consequences for political outcomes. Explores the impact of political preferences on congressional development, political parties, interest groups, and bureaucratic agencies. Limited enrollment.

**POLI 429 BIOLOGICAL FOUNDATIONS OF POLITICS (3)**

This course is an introduction to the biological underpinnings of political behavior. The influence of genes and evolution are covered, as well as the relevance of neural structures, brain organization, and neurochemistry for both universal political traits and individual variation in political orientations. Instructor permission required. Limited enrollment.

**POLI 430 SEMINAR IN TEXAS POLITICS (3)**

Research seminar in the history of Texas politics. Instructor permission required. Limited enrollment.

**POLI 431 ELECTORAL CAMPAIGNS (3)**

Examines the role of campaigns in determining the outcome of political races. Limited enrollment.

**POLI 432 URBAN POLITICS (3)**

Research seminar on political behavior and public policy in urban and metropolitan areas. Limited enrollment.

**POLI 433 COMPARATIVE LEGISLATURES (3)**

Research seminar comparing similarities and differences of legislatures in various countries. Limited enrollment.

**POLI 434 PUBLIC POLICY AND METROPOLITAN AREA GOVERNANCE (3)**

This course will examine the market-like relationship among metropolitan area governments. It will address questions of urban/suburban relationships as well as policy topics such as education and local service provision. Limited enrollment.

**POLI 435 POLITICAL PARTICIPATION (3)**

Seminar will consider normative issues, theories, and empirical evidence relating to the value, meaning, and consequences of political participation, with readings taken from American and comparative politics. Limited enrollment.

**POLI 436 POLITICS OF REGULATION (3)**

Study of the government's regulation of business and the political factors that shape its content. Limited enrollment.

**POLI 437 EDUCATION POLICY (3)**

Examines educational politics and policy from micro and macro perspectives. We will focus on school governance, structure, and finance at the federal, state, and local levels and examine the design, implementation and effects of various school reform initiatives in U.S., and to a more limited extent in other countries. Limited enrollment.

**POLI 438 RACE AND PUBLIC POLICY (3)**

Study of minority group politics and how race structures contemporary U.S. politics. Includes myths and realities of minority groups, symbolic politics and race, pluralism as a model of U.S. democracy, the intersection of class, race, and gender, civil rights movements, group consciousness, public opinion regarding minorities, and responses of national institutions to race issues. Limited enrollment.

**POLI 439 RESEARCH SEMINAR ON SOUTHERN POLITICS (3)**

Examination of political behavior and political institutions in the southern states, with emphasis on contemporary Texas politics. Limited enrollment.

**POLI 441 COMMON PROPERTY RESOURCES (3)**

Common Property Resources (CPRs), such as fisheries, aquifers, and the Internet, appear in many guises and pose a fundamental problem for governing. Exploration of theoretical underpinnings for CPRs, their growing literature, and the political and economic institutions mediating CPR dilemmas. Included is an original research project in conjunction with the instructor. Cross-listed with ENST 441. Limited enrollment. Instructor(s): Wilson.

**POLI 450 ELECTIONS IN THE AMERICAS (3)**

This course examines the electoral process in Latin American countries during the campaign season. In the course we will follow, discuss, and analyze the campaigns and elections in a selected group of countries while at the same time developing an expertise in the general functioning of the respective countries' political systems. In the course, we will follow the campaigns and elections in each country by reading local newspapers and watching local news broadcasts. An intermediate reading knowledge of Spanish is required for this course. All course discussion will be in English, but much of the reading material for the course will be in Spanish. Information on the specific elections to be examined in this year's course may be obtained from the instructor. Instructor permission required. Limited enrollment.

**POLI 454 RESEARCH PRACTICUM IN COMPARATIVE POLITICS (3)**

This course will teach students how to design and conduct empirical research in political science, with a focus on subjects in comparative politics. Students will conduct their own original research and produce a research report or paper. Limited enrollment.

**POLI 456 REGIME TRANSFORMATIONS AND TRANSITIONS (3)**

Examines why political systems may change from democratic to authoritarian, or vice versa. Distinguishes between different regime types and explores the conditions promoting social movements, political unrest, and military coups. Examines factors that help to consolidate newly formed regimes. Examples are drawn from a variety of postcolonial states. Limited enrollment.

**POLI 457 CONDITIONS OF DEMOCRACY (3)**

This course starts with definitions and theories/preconditions of democracy and then looks at specific cases of democratic transition throughout the world, democratic consolidation, reaction, and the prospects for the future. Limited enrollment.

**POLI 460 SEMINAR IN COMPARATIVE GOVERNMENT (3)**

This seminar will analyze authoritarian regimes from a comparative perspective. Limited enrollment.

**POLI 462 COMPARATIVE PUBLIC POLICY (3)**

Seminar examining the process and substance of public policy across nations, with emphasis on social policy in industrialized democracies. Instructor permission required. Limited enrollment.

**POLI 463 COMPARATIVE POLITICAL ECONOMY (3)**

Seminar exploring the interrelationship of economics and politics in advanced industrial societies. Includes economic policy making, political behavior and economic conditions, and the role of institutions in channeling conflicts between democracy and capitalism. Limited enrollment.

**POLI 464 POLITICAL ECONOMY OF DEVELOPING NATIONS (3)**

A central priority developing nations face today concerns establishing economic growth. How best to achieve strong economic performance has both an economic and political dimension. This course seeks a rudimentary understanding of economic growth, concentrating on its political determinants. Limited enrollment.

**POLI 466 POLITICAL PARTIES AND VOTING BEHAVIOR IN WESTERN DEMOCRACIES (3)**

Seminar on the determinants of party systems, the structure and functions of parties, and theories of voting behavior in Western democracies. Limited enrollment.

**POLI 470 INTERNATIONAL RELATIONS (3)**

Topic varies from year to year. Instructor permission required. Repeatable for Credit. Limited enrollment.

**POLI 471 POLITICS OF THE UNITED NATIONS (3)**

Provide students with a broad introduction to the politics of the United Nations. Topics include roll-call voting, policy choices of the security council, and issues of membership and representation. Instructor permission required. Limited enrollment.

**POLI 472 AMERICAN FOREIGN POLICY (3)**

The content of American foreign policy, its sources, and the process of policy formulation. Limited enrollment.

**POLI 475 INTERNATIONAL COOPERATION (3)**

Research seminar on theories and evidence of international cooperation. The course will explore conditions conducive to establishing and maintaining cooperation in international politics, the design of international agreements and institutions, and the influence of international agreements and institutions on international relations. Limited enrollment.

**POLI 476 INTERNATIONAL POLITICAL ECONOMY (3)**

This course is designed to survey the theoretical and empirical analysis of the politics of international economic relations. In particular, the course is designed to examine the interrelationships of economics and politics by applying economic theory to the study of politics. Limited enrollment.

**POLI 477 DOMESTIC POLITICS AND INTERNATIONAL RELATIONS (3)**

Seminar on the influence of domestic politics on international relations. The course will explore when, why, and how the political, economic, and social conditions within countries affect international political and economic relations. Instructor permission required. Limited enrollment.

**POLI 479 SEMINAR IN QUANTITATIVE INTERNATIONAL RELATIONS (3)**

Seminar exploring the quantitative study of international relations, with a focus on the study of international conflict. Students will be required to write a quantitative research paper. Instructor permission required. Repeatable for Credit. Limited enrollment.

**POLI 480 SEMINAR IN POLITICAL BEHAVIOR (3)**

Undergraduate research seminar covering the field of political behavior with special emphasis on the application of social and cognitive psychology to the study of mass political behavior. Topics include political socialization, models of voting behavior, and political participation. Limited enrollment.

**POLI 490 MODERN POLITICAL THEORY AND INTERDISCIPLINARY FIELDS (3)**

Study of the development of modern political theory and its relevance to contemporary problems. Instructor permission required. Limited enrollment.

**POLI 500 SOCIAL SCIENTIFIC THINKING I (3)**

This course introduces students to the practice of social science research including empirical description, theoretical development, and hypothesis generation and testing. It includes projects on the design and implementation of surveys, controlled experiments, archival data collection, fieldwork, case studies, and qualitative analysis. Limited enrollment.

**POLI 501 SOCIAL SCIENTIFIC THINKING II (3)**

This course is a continuation of POLI 500. Students will plan and execute an original research project and write a paper reporting the results. Pre-requisite(s): POLI 500. Limited enrollment.

**POLI 502 INTRODUCTION TO STATISTICS (3)**

This course aims at providing students with a working knowledge of statistics in political science. It involves the study of descriptive and inferential statistics, as well as hands-on experience with computer statistical packages. Limited enrollment.

**POLI 503 TOPICS IN METHODS AND DATA ANALYSIS (3)**

Applications of least squares and general linear mode. Cross-listed with STAT 503. Limited enrollment.



**POLI 504      METHODOLOGY AND DATA ANALYSIS (3)**

Study of applications of maximum likelihood estimation. Limited enrollment.

**POLI 505      TOPICS IN POLITICAL METHODOLOGY (3)**

Special topics in political methodology. Repeatable for Credit. Limited enrollment.

**POLI 511      MEASUREMENT AND RESEARCH DESIGN (3)**

Study of advanced topics in research design and measurement theory. Limited enrollment.

**POLI 520      APPROACHES TO COMPARATIVE GOVERNMENT (3)**

Core graduate course analyzing basic approaches to the study of comparative government. Limited enrollment.

**POLI 527      INSTITUTIONAL ANALYSIS (3)**

Theories of institutional analysis and design. Limited enrollment.

**POLI 530      APPROACHES TO AMERICAN GOVERNMENT (3)**

Core graduate course. Includes an analysis of basic approaches to the study of American politics. Limited enrollment.

**POLI 531      STATE POLITICS (3)**

Examines similarities and differences in the organization of state politics. Major issues include state legislative organization, state elite behavior, and policy implementation. Limited enrollment.

**POLI 532      COMPARATIVE LEGISLATURES (3)**

Provides the student with the basic concepts and theories necessary to understand the functions and organization of legislatures/parliaments/assemblies in democratic societies. This course takes a broad-based perspective, including research that focuses on national parliaments and U. S. state legislatures. Limited enrollment.

**POLI 533      ADVANCED TOPICS IN POLITICAL BEHAVIOR (3)**

Graduate research seminar in the subfield of political behavior. Content varies from year to year. Instructor permission required. Repeatable for Credit. Limited enrollment.

**POLI 534      INTEREST GROUPS AND POLITICAL PARTIES (3)**

Graduate research seminar in the subfields of interest groups and political behavior. Limited enrollment.

**POLI 535      RACE, ETHNICITY, AND AMERICAN POLITICS (3)**

Graduate seminar that examines the role of race and ethnicity in American politics. This course provides an examination of the behavioral and electoral implications of racial and ethnic diversity. Limited enrollment.

**POLI 537      PUBLIC POLICY AND BUREAUCRACY (3)**

Study of the administration and implementation of public policies across federal, state, and substate governments. Limited enrollment.

**POLI 538      POLITICAL ECONOMY OF POLICY CHANGE (3)**

This course will explore policy and political change primarily, but not exclusively, in the United States. Using a political economy approach, we will explore different models of change and identify the actors, institutions, and conditions that facilitate stability in change in state, local and national policymaking. Limited enrollment.

**POLI 540      INTERNATIONAL RELATIONS (3)**

Core graduate course. Includes an analysis of basic approaches to the study of international relations. Limited enrollment.

**POLI 541      INTERNATIONAL COOPERATION (3)**

Graduate seminar on theories and evidence of international cooperation. Discussion of the difficulties in establishing cooperation under anarchy and the conditions under which international cooperation is most likely to occur. Limited enrollment.

**POLI 564      POLITICAL ECONOMY OF DEVELOPMENT (3)**

A central priority developing nations face today concerns establishing economic growth; how best to achieve strong economic performance has both an economic and political dimension. This course seeks a rudimentary understanding of economic growth, concentrating on its political determinants. Limited enrollment.

**POLI 565      POLITICAL PROTEST (3)**

This course looks at various theories of collective action and social movements. It will examine theoretical debates about why individuals and groups occasionally redress their grievances through protest and more often endure hardships passively. It will evaluate the relative merit of these theories in explaining cases of protest and passivity worldwide. Limited enrollment.

**POLI 566      POLITICAL PARTIES AND VOTING BEHAVIOR IN WESTERN DEMOCRACIES (3)**

Graduate seminar that examines the theoretical literature on party development, organization, and change in Western democracies. Limited enrollment.

**POLI 567      COMPARATIVE POLITICAL BEHAVIOR (3)**

In this course, we will explore the nature and sources of cross-national differences in mass political behavior. Limited enrollment.

**POLI 568 COMPARATIVE POLITICAL INSTITUTIONS (3)**

Examines the design of political institutions in democracies, and their effect on elections, governance, and representation. Explores topics such as the presidential-parliamentary debate, electoral laws and party systems, political parties, electoral institutions and the election of women and minorities, institutional engineering, and U.S. experiences with alternative electoral systems. Limited enrollment.

**POLI 570 SEMINAR IN INTERNATIONAL CONFLICT (3)**

Seminar in international conflict. Emphasis on formal theories and quantitative analysis of the causes of war. Limited enrollment.

**POLI 572 FOREIGN POLICY DECISION MAKING (3)**

Study of foreign policy, its sources, and the process of policy formulation. Limited enrollment.

**POLI 574 COLLECTIVE SOCIAL CHOICE (3)**

Introduction to a growing body of literature on how and why individual preferences dominate those of others. Includes the relationship between decision-making structures and the nature of decisional outcomes. Limited enrollment.

**POLI 575 GAME THEORY (3)**

Examination of current developments in game theory with application to political science. Limited enrollment.

**POLI 576 INTERNATIONAL POLITICAL ECONOMY (3)**

Seminar surveying some of the primary theoretical perspectives and analytical approaches for studying international political economy. Includes a survey of contemporary literature, with special emphasis on theory and research, as well as instructions in how to critically evaluate research and set up a research project. Limited enrollment.

**POLI 579 SEMINAR IN MODELING INTERNATIONAL RELATIONS (3)**

Topic varies from year to year. Instructor permission required. Repeatable for Credit. Limited enrollment.

**POLI 580 SEMINAR IN AMERICAN POLITICS (3)**

Topics vary from year to year. Instructor permission required. Repeatable for Credit.

**POLI 591 DIRECTED READING-METHODOLOGY (3)**

Instructor permission required. Repeatable for Credit.

**POLI 592 DIRECTED READING METHODOLOGY (3)**

Instructor permission required. Repeatable for Credit.

**POLI 593 DIRECTED READING-AMERICAN POLITICS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 594 DIRECTED READING-AMERICAN POLITICS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 595 DIRECTED READING-INTERNATIONAL RELATIONS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 596 DIRECTED READING-INTERNATIONAL RELATIONS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 597 DIRECTED READING-COMPARATIVE POLITICS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 598 DIRECTED READING-COMPARATIVE POLITICS (3)**

Instructor permission required. Repeatable for Credit.

**POLI 599 TEACHING POLITICAL SCIENCE (1)**

This course prepares graduate students to design and teach classes at the college level. Repeatable for Credit.

**POLI 600 MA RESEARCH AND THESIS (1 TO 15)**

Research and thesis for resident students. Repeatable for Credit.

**POLI 800 PH.D. RESEARCH AND THESIS (1 TO 15)**

Repeatable for Credit.

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**PORT (PORTUGUESE)**
**School of Humanities/Center for Study of Languages****PORT 101 INTRODUCTION TO PORTUGUESE LANGUAGE AND CULTURE I (5)**

Introduction to the study of the Portuguese language and culture with emphasis on the development of listening, speaking, reading and writing. This course uses textbooks as well as music, websites and videos for access to various kinds of cultural material and pretexts for communication. Includes one hour/wk of lab work. Recommended prerequisite(s): No prior knowledge of Portuguese. Limited enrollment. URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PORT 102 INTRODUCTION TO PORTUGUESE LANGUAGE AND CULTURE II (5)**

Continuation of PORT 101. Pre-requisite(s): PORT 101, or placement test or permission of instructor. Limited enrollment. URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PORT 201 INTERMEDIATE PORTUGUESE LANGUAGE AND CULTURE I (4)**

Students progress to more creative oral and written communicative activities. Texts, music, videos, and the internet will be used to address a wide variety of topics and real-life situations. Pre-requisite(s): PORT 102, or placement test or permission of instructor. Limited enrollment. URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PORT 202 INTERMEDIATE PORTUGUESE LANGUAGE AND CULTURE II (4)**

Students will continue to develop communicative competence in oral and written Portuguese using texts, music, films, and the web as sources for authentic cultural material in diverse areas. Pre-requisite(s): PORT 201, or placement test or permission of instructor. Limited enrollment. URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PORT 204 PORTUGUESE LANGUAGE AND CULTURE OF BRAZIL (4)**

This class will focus on the culture of Brazil as seen through movies, music, documentaries, short stories, newspaper and magazine articles. Students will improve their language skills in all four modalities. Prerequisite(s): Intermediate-mid level in Portuguese (three semesters of Portuguese at Rice) or permission of instructor. Repeatable for Credit. Offered Spring. URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem). Instructor(s): Bloem.

**PORT 400 INDEPENDENT STUDY (1 TO 4)**

URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PORT 401 INDEPENDENT STUDY (3)**

URL: [lang.rice.edu/sbloem](http://lang.rice.edu/sbloem).

**PSYC (PSYCHOLOGY)****School of Social Sciences/Psychology****PSYC 101 INTRODUCTION TO PSYCHOLOGY (3)**

Survey of topics, problems, and approaches in contemporary psychology. Includes the biological basis of behavior, sensation, perception, attention, learning and memory, thinking, language, abnormal behavior and therapies, personality and individual differences. Required for psychology majors.

**PSYC 102 READINGS IN INTRODUCTORY PSYCHOLOGY (1)**

Discussion of articles and research reports in psychology. Corequisite(s): PSYC 101.

**PSYC 202 INTRODUCTION TO SOCIAL PSYCHOLOGY (3)**

Overview of topics in social psychology. Includes conformity and social influence, attitude formation and change, aggression, altruism, relationships, liking and loving, prejudice and stereotyping, as well as applications to other disciplines (e.g. law, marketing, the workplace, etc.). Required for psychology majors. Pre-requisite(s): PSYC 101.

**PSYC 203 INTRODUCTION TO COGNITIVE PSYCHOLOGY (3)**

An introduction to topics in cognitive psychology including perception, memory, psycholinguistics, problem solving and decision making. Required for psychology majors. Pre-requisite(s): PSYC 101 or permission of instructor.

**PSYC 231 INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY (3)**

An overview of the principles, techniques, and theories of psychology applied in the industrial setting. Pre-requisite(s): PSYC 101 or permission of instructor.

**PSYC 260 UNDERGRADUATE PROFESSIONAL ISSUES IN PSYCHOLOGY (1)**

This seminar will provide students interested in psychology with an opportunity to explore psychology as a major and a career. Through guest lecturers, group discussions, and class projects, students will learn about diverse fields and potential career paths in psychology. Must be enrolled in one of the following Major(s): Psychology. Must be in one of the following Classification(s): Junior, Senior. Instructor permission required. Limited enrollment.

**PSYC 308 MEMORY (3)**

Critical review of traditional and contemporary approaches to the study of remembering and forgetting. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 309 PSYCHOLOGY OF LANGUAGE (3)**

Study of human and other animal communication. Includes the structure of human language, word meaning and semantic memory, psychological studies of syntax, bilingualism, language and thought, and language errors and disorders. Cross-listed with LING 309. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 315 INTRODUCTION TO SEMANTICS (3)**

Introduction to basic approaches to the study of meaning in linguistics and related fields. Includes the cognitive representation of meaning, lexical categorization, conceptual structures, metaphor/metonymy, meaning change, pragmatic inference, and the relation of language and mind. Cross-listed with LING 315. Pre-requisite(s): PSYC 101 and PSYC 203 and LING 200 or permission of instructor.

**PSYC 321 DEVELOPMENTAL PSYCHOLOGY (3)**

Study of behavioral changes with age and general laws in both human and nonhuman species. Prerequisite(s): PSYC 101 or permission of instructor.

**PSYC 325 LANGUAGE ACQUISITION (3)**

This course focuses on some of the central aspects of first language acquisition. Topics include statistical learning; the use of special kinds of input modification ('motherese'); how children's grammatical, lexical-semantic, and phonological systems develop; the critical period hypothesis; and language development in the absence of a conventional model ('home sign'). Cross-listed with LING 325. Instructor(s): Franklin.

**PSYC 329 PSYCHOLOGICAL TESTING (3)**

Offers a detailed examination of psychological test development and analysis. Topics include an exploration of different forms of psychological tests (e.g. intelligence, attitudes, personality, clinical), reliability and validity of tests, and practical issues in testing such as test bias (e.g. gender differences). Pre-requisite(s): PSYC 101 and PSYC 202 or permission of instructor.

**PSYC 330 PERSONALITY THEORY AND RESEARCH (3)**

Examination of those aspects of personality emphasized by major theorists past and present. Prerequisite(s): PSYC 101 and PSYC 202 or permission of instructor. Recommended prerequisite(s): PSYC 202, PSYC 340.

**PSYC 331 PSYCHOLOGY OF GENDER (3)**

Overview of research and theory on gender in psychology. Cross-listed with SWGS 331. Prerequisite(s): PSYC 101 and PSYC 202 or permission of instructor.

**PSYC 332 ABNORMAL BEHAVIOR (3)**

Study of the diagnosis and treatment of mental disorders. Pre-requisite(s): PSYC 101 and PSYC 202 or permission of instructor.

**PSYC 339 STATISTICAL METHODS-PSYCHOLOGY (4)**

Introduction to quantitative and computer methods applicable to the analysis of experimental and correlational data. Required for psychology majors. Pre-requisite(s): PSYC 101 or permission of instructor. Limited enrollment.

**PSYC 340 RESEARCH METHODS (4)**

A continuation of PSYC 339, with emphasis on individual student experiments and the writing of research reports. Required for psychology majors. Pre-requisite(s): PSYC 101 and PSYC 339 or permission of instructor.

**PSYC 341 HUMAN COMPUTER INTERACTION (3)**

Study of design and evaluation of interactive computing systems for human use and the major phenomena surrounding them.

**PSYC 342 COMPUTER APPLICATIONS (3)**

The use of computers in psychological research and in usability engineering. The emphasis will be on dynamic HTML and JavaScript. Topics will include designing and running psychology experiments to run on the web and the use of web-based video. Graduate/Undergraduate version: PSYC 504. Instructor permission required.

**PSYC 350 PSYCHOLOGY OF LEARNING (3)**

A consideration of historically important and modern perspectives on learning. Both human and animal research will be discussed. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 351 PSYCHOLOGY OF PERCEPTION (3)**

Overview of the sensory and cognitive processes involved in human vision and audition. Not offered every year. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 360 THINKING (3)**

Study of the higher mental processes. Includes problem solving, judgment, decision making, and reasoning. Graduate/Undergraduate version: PSYC 527. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 362 BIOPSYCHOLOGY (3)**

Overview of the neuro-physiological correlates of behavior. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.

**PSYC 370 INTRODUCTION TO HUMAN FACTORS AND ERGONOMICS (3)**

Application of principles of psychology and human performance to the design of modern systems. Prerequisite(s): PSYC 101 and PSYC 203 or permission of instructor.

- PSYC 409 METHODS IN HUMAN-COMPUTER INTERACTION (3)**  
Introduction to methods for developing and testing user interfaces to computer systems. The focus is on web-based applications. Graduate/Undergraduate version: PSYC 640. Pre-requisite(s): PSYC 101 and PSYC 203 or permission of instructor.
- PSYC 411 HISTORY OF PSYCHOLOGY (3)**  
Survey of evolution of psychological theory from the Greeks to the present. Includes development of scientific approaches to the study of human thought and behavior. Graduate/Undergraduate version: PSYC 511. Pre-requisite(s): PSYC 101 and PSYC 202 or permission of instructor.
- PSYC 430 COMPUTATIONAL MODELING OF COGNITIVE PROCESSES (3)**  
A survey of computational approaches to cognitive processes. The emphasis will be on recent production system models, but other approaches will also be covered. The course will involve evaluation of existing models and hands-on experience in modeling. Graduate/Undergraduate version: PSYC 543. Instructor permission required. Recommended prerequisite(s): PSYC 203, COMP 200 (or equivalent) or permission of instructor.
- PSYC 431 ADVANCED INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY SEMINAR (3)**  
An emphasis on reading original published research. Topics covered include personnel selection, training, motivation, job attitudes, and groups. Instructor permission required.
- PSYC 432 BRAIN AND BEHAVIOR (3)**  
An in depth examination of the neural basis of higher mental functions in humans including perception, attention, memory, motor skill, and language. Claims and controversies in cognitive neuroscience will be discussed. Pre-requisite(s): PSYC 101 and PSYC 203 and PSYC 362 or permission of instructor. URL: [www.owl.net.rice.edu/~psyc432](http://www.owl.net.rice.edu/~psyc432). Instructor(s): Ro.
- PSYC 441 HUMAN-COMPUTER INTERACTION (3)**  
Study of the design and evaluation of interactive computing systems for human use and the major phenomena surrounding them. Graduate/Undergraduate version: PSYC 541. Instructor permission required.
- PSYC 445 HEALTH PSYCHOLOGY (3)**  
Consideration of the research on psychological factors and health with special consideration to the role of health beliefs in people's practice and nonpractice of health, illness, and sick-role behaviors. Recommended Prerequisite(s): PSYC 101, PSYC 202, two additional psychology courses or permission of instructor. Limited enrollment.
- PSYC 455 ADVANCED SEMINAR IN CLINICAL PSYCHOLOGY (3)**  
Topics will vary. Pre-requisites PSYC 101 & 332 or permission of instructor. Repeatable for credit. Instructor permission required. Limited enrollment. Offered Fall.
- PSYC 460 PSYCHOLOGY OF EMOTION AND MOTIVATION (3)**  
Study of motives and emotions as causes of human behavior. Includes biological motives, aggression, emotions and emotional expression, and individual differences in motivation.
- PSYC 465 OLFACTORY PERCEPTION (3)**  
Overview theories and research related to olfaction. Special topics include olfactory memory, the effect of emotion and cognition on olfaction, olfaction as a channel of communication, sensory integration, and ERP and fMRI studies on olfaction and its relationship with other sensory systems. Instructor permission required.
- PSYC 470 ENGINEERING PSYCHOLOGY (3)**  
Principles of psychology and human performance applied to the design of modern systems. Instructor permission required.
- PSYC 471 INTRODUCTION TO FUNCTIONAL MAGNETIC RESONANCE IMAGING (3)**  
A comprehensive introduction to all aspects of functional magnetic resonance imaging, a cutting-edge methodology that allows direct observation of the neural processing underlying human perception and cognition. Lectures will cover methods and applications of fMRI. The lab portion will involve designing experimental paradigms and collecting and analyzing fMRI data. \*\*The course is scheduled to meet at The University of Texas Medical School Building B.645. Instructor permission required. Limited enrollment.
- PSYC 475 STEREOTYPING AND PREJUDICE (3)**  
Consideration of modern research on stereotypes of, prejudice against, and discrimination toward racial, gender, and stigmatized groups. Pre-requisite(s): PSYC 202. Recommended prerequisite(s): PSYC 203 and 340. Limited enrollment.
- PSYC 480 ADVANCED TOPICS IN PSYCHOLOGY (3)**  
Topic will vary. Pre-requisite(s): PSYC 202 and PSYC 203. Repeatable for Credit.
- PSYC 485 SUPERVISED RESEARCH (1 to 6)**  
Supervised empirical research. Research paper required. Sponsorship by faculty member required. Instructor permission required. Recommended prerequisite(s): PSYC 339, PSYC 340. Repeatable for Credit.

**PSYC 488 SUPERVISED READING (1 TO 6)**

Supervised reading of books and empirical papers on a topic of mutual interest to students and faculty. Term paper required. Sponsorship by faculty member required. Must be enrolled in one of the following Major(s): Psychology. Pre-requisite(s): PSYC 339 and PSYC 340. Instructor permission required. Repeatable for Credit.

**PSYC 495 SUMMER INTERNSHIP (3)**

Provides enrollment for various department summer internship. Instructor permission required. Repeatable for Credit.

**PSYC 499 HONORS THESIS (1 TO 6)**

Sponsorship by faculty member required. Pre-requisite(s): PSYC 339 and PSYC 340. Instructor permission required. Repeatable for Credit.

**PSYC 502 ADVANCED PSYCHOLOGICAL STATISTICS I (3)**

Introduction to inferential statistics with emphasis on analysis of variance. Cross-listed with STAT 509.

**PSYC 503 ADVANCED PSYCHOLOGICAL STATISTICS II (3)**

A continuation of PSYC 502, focusing on multiple regression. Other multivariate techniques and distribution-free statistics are also covered. Cross-listed with STAT 510. Pre-requisite(s): PSYC 502 or permission of instructor.

**PSYC 504 COMPUTER APPLICATIONS IN PSYCHOLOGY (3)**

The use of computers in psychological research and in usability engineering. The emphasis will be on dynamic HTML and JavaScript. Topics will include designing and running psychology experiments to run on the web and the use of web-based video. Graduate/Undergraduate version: PSYC 342.

**PSYC 507 RESEARCH METHODS (3)**

Graduate-level treatment of a wide range of laboratory and field research methodologies. Repeatable for Credit.

**PSYC 511 HISTORY AND SYSTEMS OF PSYCHOLOGY (3)**

Study of the philosophical foundations of psychology, the development of scientific models in the 19th century, 20th-century schools of psychology, and the growth of fields of modern psychology. Graduate/Undergraduate version: PSYC 411.

**PSYC 520 FOUNDATIONS OF COGNITIVE PSYCHOLOGY (3)**

An introduction to the basic topics in cognitive psychology, including perception, memory, psycholinguistics, concept formation, problem solving, and decision making.

**PSYC 521 PSYCHOLOGY OF PERCEPTION (3)**

An overview of the sensory and cognitive processes involved in human vision and audition.

**PSYC 522 INFORMATION PROCESSING AND ATTENTION (3)**

An exploration of topics in attention, including information overload, selective attention, response conflict, and automatic/unconscious and controlled/conscious processes. The neural mechanisms underlying these processes will also be discussed.

**PSYC 524 MEMORY (3)**

Overview of issues and research in remembering and forgetting.

**PSYC 525 PSYCHOLINGUISTICS (3)**

Study of the psychology of language. Includes the study of speech production, reading, syntax, meaning, bilingualism, language and thought, and language errors and disorders.

**PSYC 527 THINKING (3)**

The study of higher mental processes includes problem judgment, planning, decision making, and reasoning. Graduate/Undergraduate version: PSYC 360.

**PSYC 529 COGNITIVE RESEARCH SEMINAR (1 TO 3)**

A weekly student-staff seminar on current and recent research about mental phenomena. Repeatable for Credit.

**PSYC 530 FOUNDATIONS OF I/O PSYCHOLOGY (3)**

Graduate-level introduction to the study of human behavior in the work setting.

**PSYC 531 HF/HCI RESEARCH SEMINAR (1 TO 3)**

A weekly student-staff seminar on various human factors and human computer interaction topics.

**PSYC 533 I/O PSYCHOLOGY RESEARCH SEMINAR (1 TO 3)**

A weekly student-staff seminar on various industrial-organizational psychology topics. Repeatable for Credit.

**PSYC 540 FOUNDATIONS OF ENGINEERING PSYCHOLOGY (3)**

An introduction to the basic topics in engineering psychology including basic methods of systems analysis, display-control design, mental and workload analysis, motor control, and error in human performance.

**PSYC 541 HUMAN COMPUTER INTERACTION (3)**

Study of the design and evaluation of interactive computing systems for human use and the major phenomena surrounding them. Graduate/Undergraduate version: PSYC 441.

**PSYC 543 COMPUTATIONAL MODELING OF COGNITIVE PROCESSES (3)**

A survey of computational approaches to modeling cognitive processes. The emphasis will be on recent production system models, but other approaches will also be covered. The course will involve evaluation of existing models and hands-on experience in modeling. Graduate/Undergraduate version: PSYC 430.

**PSYC 550 FOUNDATIONS OF SOCIAL PSYCHOLOGY (3)**

Review of theories of social psychology with an emphasis on current empirical research.

**PSYC 560 PSYCHOLOGY PRESENTATIONS (3)**

Practicum on oral psychology presentation.

**PSYC 561 TEACHING IN PSYCHOLOGY (1 TO 3)**

Assistance in the teaching of undergraduate and occasionally graduate courses in psychology. Repeatable for Credit.

**PSYC 563 INTERNSHIP (1 TO 3)**

Repeatable for Credit.

**PSYC 565 HUMAN OLFACTION (3)**

Overview theories and research to olfaction. Special topics include olfactory memory, the effect of emotion and cognition on olfaction, olfaction as a channel of communication, sensory integration, and ERP and fMRI studies on olfaction and its relationship with other sensory systems.

**PSYC 571 FIRST YEAR PROJECT (1 TO 3)**

Individual research project undertaken in the first year of the graduate program. Repeatable for Credit.

**PSYC 572 SECOND YEAR PROJECT (1 TO 3)**

Individual research project undertaken during the second year of the graduate program. Repeatable for Credit.

**PSYC 573 NON-THESIS GRADUATE RESEARCH (1 TO 6)**

Individual research not for first- or second-year project or thesis. Repeatable for Credit.

**PSYC 575 COGNITIVE NEUROSCIENCE I (3)**

Overview of neuropsychological and cognitive neuroscience approaches to higher mental functions including sensation and perception, attention, motor control, and neuroplasticity. Other topics include basic neuroanatomy, experimental and clinical investigative methods and the historical and philosophical context of contemporary neuroscience. Cross-listed with NEUR 501.

**PSYC 576 COGNITIVE NEUROSCIENCE II (3)**

Overview of neuropsychological and cognitive neuroscience approaches to higher mental functions including language, memory, executive functions, reasoning, and numerical processing. Cross-listed with NEUR 502.

**PSYC 577 INTRODUCTION TO FUNCTIONAL NEUROANATOMY (2)**

Anatomy and function of components of the nervous system with an emphasis on the central nervous system.

**PSYC 580 DEVELOPMENTAL COGNITIVE NEUROSCIENCE (3)**

Seminar focusing on the neural/biological bases of both normal and abnormal human development through a survey of recent research in developmental cognitive neuroscience. Topics include perceptual, motive, cognitive, and language development as well as experimental research methods for studying the developing brain.

**PSYC 581 VISION SCIENCE (3)**

Advanced graduate seminar in the psychology of vision covering the neural, psychophysical, and phenomenological approaches to visual perception.

**PSYC 582 EARLY SENSORY, PERCEPTUAL AND ATTENTIONAL DEVELOPMENT (3)**

This is a survey course for graduate students interested in the development of sensory systems, perception, and attention. There will be original empirical and theoretical readings from the literature on the development of these functions primarily during infancy. Neurobiological underpinnings for these functions will be debated and discussed.

**PSYC 602 PSYCHOMETRICS (3)**

Test theory including reliability, validity, item response theory, and generalizability theory. In addition, the course offers hands-on experience with analysis software and discussion of practical issues such as test bias, item writing, and scale construction issues.

**PSYC 620 ADVANCED TOPICS IN COGNITIVE PSYCHOLOGY (1 TO 3)**

Topics will vary. Repeatable for Credit.

**PSYC 621 TOPICS IN MEMORY (3)**

Topics will vary. Repeatable for Credit.

**PSYC 628 MEMORY RESEARCH SEMINAR (1)**

Weekly seminar to discuss recent research in human memory. Repeatable for Credit.

**PSYC 629 PSYCHOLINGUISTICS RESEARCH SEMINAR (1)**

Weekly seminar to discuss recent research in psycholinguistics. Repeatable for Credit.

**PSYC 630 ADVANCED TOPICS IN I/O (3)**

Topics will vary. Pre-requisite(s): PSYC 530 or permission of instructor.

**PSYC 632 LEADERSHIP (3)**

Examination of the major psychological approaches to the study of leadership. Emphasis is on theory and practice in formal organizations.

**PSYC 634 PERSONNEL PSYCHOLOGY (3)**

Examination of the theory, research and applications in personnel selection including job analysis, job performance, evaluation of performance, validation of selection methods, and training. Pre-requisite(s): PSYC 530 or permission of instructor.

**PSYC 636 ORGANIZATIONAL PSYCHOLOGY (3)**

Contemporary theory and research in organizational psychology including topics such as motivation, leadership, job satisfaction, occupational stress, social cognition in work organizations, and group processes. Pre-requisite(s): PSYC 530 or permission of instructor.

**PSYC 639 I/O PSYCHOLOGY INTERNSHIP (1 TO 3)**

Supervised internship in organizational and/or personnel psychology. Repeatable for Credit.

**PSYC 640 TOPICS IN HUMAN-COMPUTER INTERACTION (3)**

Topics will vary. Graduate/Undergraduate version: PSYC 409. Repeatable for Credit.

**PSYC 649 ENGINEERING PSYCHOLOGY INTERNSHIP (1 TO 3)**

Supervised internship in engineering psychology. Repeatable for Credit.

**PSYC 651 TOPICS IN SOCIAL PSYCHOLOGY (3)**

Topics will vary. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit.

**PSYC 660 PROFESSIONAL ISSUES (3)**

Discussion of selected topics on professional matters. Includes grant writing, licensing, and ethics in psychology.

**PSYC 671 METHODS IN COGNITIVE NEUROSCIENCE (3)**

Explores issues in functional neuroimaging and provides hands-on experience with experimental design, data acquisition, and analysis. Examines hemodynamic (PET, fMRI), electrophysiologic (EEG, MEG), and other (e.g. neural stimulation, event-related optical) methods of measuring functional activation in the human brain related to cognitive operations. \*\*The course is scheduled to meet at The University of Texas Medical School Building, B.645.

**PSYC 700 THESIS RESEARCH (1 TO 15)**

Research for the master's thesis. Repeatable for Credit.

**PSYC 800 DISSERTATION RESEARCH (1 TO 15)**

Research for the doctoral dissertation. Repeatable for Credit.

**RELI (RELIGIOUS STUDIES)****School of Humanities/Religious Studies****RELI 101 INTRODUCTION TO THE STUDY OF RELIGION (3)**

Comparative and interdisciplinary analysis of key elements (including scripture, religious experience, ideas of the divine, religious art and practices) of two Western and two non-Western religions, of the scholarly study of religion, and of the role of religion in the contemporary world. Offered Spring. Instructor(s): Parsons.

**RELI 103 INTRODUCTION TO NEW TESTAMENT STUDIES (3)**

Focuses on understanding the historical, cultural and religious traditions within the biblical narratives, the process of the canonization of the New Testament texts, the variety of methods of interpretation used to study the biblical materials. Not offered this academic year. Instructor(s): DeConick.

**RELI 111 INTRODUCTION TO AFRICAN RELIGIONS (3)**

Introduction to the structures of African religions through readings. Topics include community, cosmology, ritual, ethical values, magic, witchcraft, spirit possession, contribution to nationalism, social change, religion and art, and transplantation of African Religions in the Americas. Not offered this academic year. Instructor(s): Bongmba.

**RELI 113 INTRODUCTION TO CHRISTIANITY IN AFRICA (3)**

An introductory reading course examining the dynamics of African Christianity from the early church to the present. Course will include studying the African church during the Patristic era, the Colonial period, Prophetic Movements, nationalism, racial tensions, the role of women, and the emergence of a distinct theological voice. Not offered this academic year. Instructor(s): Bongmba.

**RELI 122 THE BIBLE AND ITS INTERPRETERS (3)**

An introduction to the Hebrew Bible/Old Testament. Compares modern-critical reading with early Jewish and Christian, often fanciful interpretations. Offered Fall. Instructor(s): Henze.



**RELI 125 INTRODUCTION TO BIBLICAL HEBREW I (3)**

An introduction to Biblical Hebrew (two semesters) with emphasis on grammar and vocabulary. Not offered this academic year. Instructor(s): Henze.

**RELI 126 INTRODUCTION TO BIBLICAL HEBREW II (3)**

Continuation of RELI 125. Emphasis on grammar and vocabulary, with selected readings from the Hebrew Bible. Cross-listed with HEBR 126. Not offered this academic year. Instructor(s): Henze.

**RELI 127 INTERMEDIATE BIBLICAL HEBREW I (3)**

Readings in the Hebrew Bible as well as in some unvocalized texts from the Dead Sea Scrolls. Review of grammar and vocabulary. Pre-requisite(s): RELI 125 and RELI 126. Not offered this academic year. Instructor(s): Henze.

**RELI 128 INTERMEDIATE BIBLICAL HEBREW II (3)**

Continuation of RELI 127 (RELI 127 is not a prerequisite). Cross-listed with HEBR 128. Not offered this academic year. Instructor(s): Henze.

**RELI 131 INTRODUCTION TO TIBETAN LANGUAGE & CULTURE (3)**

Varied topics include traditional Buddhist texts as well as modern reflections on Tibet, film, and foundations of the Tibetan language. Cross-listed with TIBT 131. Graduate/Undergraduate version: RELI 531. Repeatable for Credit. Offered Fall. Instructor(s): Klein.

**RELI 132 ADVANCED TIBETAN LANGUAGE AND CULTURE (4)**

Readings in Tibetan Bon and Buddhist religious texts. Cross-listed with TIBT 132. Graduate/Undergraduate version: RELI 532. Pre-requisite(s): RELI 131. Instructor permission required. Repeatable for Credit. Offered Spring. Instructor(s): Klein.

**RELI 140 INTRODUCTION TO CHINESE RELIGIONS (3)**

Surveys the major Chinese religious traditions of Confucianism, Daoism and Buddhism. Readings will include both philosophical texts, historical and anthropological studies, as well as popular literature. Cross-listed with ASIA 140. Not offered this academic year.

**RELI 157 RELIGION AND HIP HOP CULTURE IN AMERICA (3)**

Hip Hop culture has changed how life is discussed and conducted. However, one of the under-explored dimensions of Hip Hop culture involves its religious sensibilities. Using lectures, discussions, films, and video presentations, this course explores Hip Hop culture's religious dimensions through its musical language-rap music. Not offered this academic year. Instructor(s): Pinn.

**RELI 158 LIBERATION THEOLOGIES (3)**

This course seeks to acquaint students with examples of liberation theology, as they relate to the following issues: racism, sexism, classism, and environmental destruction. Attention is given to the context, construction, form, and aims of Latin American liberation theology, Black theology, Feminist theology, and Theology in the Intersections. Graduate/Undergraduate version: RELI 548. Limited enrollment. Not offered this academic year. Instructor(s): Pinn.

**RELI 164 WHO IS (NOT) A JEW? (3)**

Explore problems with identity--ethnic, political, spiritual-- in the case of the other Jew. Consider themes of anti-Semitism and philo-Semitism, insider and outsider, tradition and innovation. Examine competing views purveyed through diverse media such as literature, film, art, and music. Selected texts from St. Paul, Shakespeare, Dickens, Marx, George Eliot, Freud, Chagall, Cynthia Ozick, Bob Dylan, and Woody Allen. Cross-listed with FSEM 164. Limited enrollment. Offered Fall. Instructor(s): Kaplan.

**RELI 170 FRESHMAN SEMINAR: RELIGION AND VIOLENCE (3)**

Seminar explores the nexus of religion and violence as it appears in sacred traditions, as it played out historically, and as it occurs in the contemporary world. Discussions and readings include sociological, psychological, philosophical, and political approaches to religion itself, to violence in general, and particularly religious violence. Cross-listed with FSEM 170, HIST 170. Not offered this academic year. Instructor(s): Quillen; Carroll.

**RELI 205 VIOLENCE, SACRIFICE, AND RELIGION (3)**

This course examines the sources of inter-human violence, from murder to man-made mass death. It asks whether (and if so, how) religious belief and practice has got to do with it. It addresses questions raised by sacrifice--human, animal, environmental, spiritual--in anthropological, psychological, literary, political, and philosophical terms. Not offered this academic year. Instructor(s): Kaplan.

**RELI 209 INTRODUCTION TO JUDAISM (3)**

Post-biblical Judaism reflected in ancient rabbinical (legal space and non-legal) literature, feminism, medieval Jewish philosophy with special emphasis on Maimonides, and modern developments such as Hasidism, Musar, liberal Judaism, and Zionism. Limited enrollment. Not offered this academic year. Instructor(s): Kaplan.

**RELI 210 ETHICS IN JUDAISM (3)**

What-if anything-is right, good, and just about our intentions and actions? The course surveys urgent questions raised in Jewish philosophy concerning law, morality, and politics. Topics include freedom and frailty, gender and government, emotions and reasons, suffering and hope. Readings in translation ancient, medieval, modern, and contemporary writings. Course equivalency: RELI 330. Offered Spring. Instructor(s): Kaplan.

**RELI 211 JESUS AT THE MOVIES (3)**

Explores how the portrayal of Jesus and the biblical narrative has varied in cinema as social, political and religious perspectives have shifted over this century. Not offered this academic year. Instructor(s): DeConick.

**RELI 221 THE LIFE OF THE PROPHET MUHAMMAD (3)**

This course will examine the life of the Prophet Muhammad, focusing on its significance for Muslims and for non-Muslims. Readings in The Qur'an, Ibn Hisham, and Haykal. Cross-listed with ASIA 221. Not offered this academic year. Instructor(s): Cook.

**RELI 223 QUR'AN AND COMMENTARY (3)**

Survey of the major themes of the Qur'an and selected types of commentary on it from the early Islamic period until the present day. Offered Fall. Instructor(s): Cook.

**RELI 225 REVOLUTIONARY ISLAM: SHI'ISM (3)**

This course will cover Shi'ism at an introductory level, focusing upon the Imami (Twelve) and Ismai'ili branches of Shi'ism but also including the so-called Ghulat sects. Not offered this academic year. Instructor(s): Cook.

**RELI 230 ASIAN RELIGIONS IN AMERICA (3)**

A survey course on Hinduism, Buddhism, Taoism, and Jainism in America, from the colonial period to the present, with a special focus on American metaphysical religion, the counterculture, the New Age, and the history of Western colonialism, transcultural encounter, translation and immigration. Cross-listed with ASIA 230. Not offered this academic year. Instructor(s): Kripal.

**RELI 231 THE ENLIGHTENMENT OF THE BODY (3)**

Beginning with a historical survey of the American metaphysical tradition, this course turns to a close study of the Esalen Institute in Big Sur, California, as a unique window into some of the different ways the tradition has appropriated Asian religions, psychological models of the unconscious, and contemporary scientific paradigms. Cross-listed with ASIA 231. Graduate/Undergraduate version: RELI 505. Offered Spring. Instructor(s): Kripal.

**RELI 232 RELIGIONS FROM INDIA (3)**

This course will survey the religions of India, namely Hinduism, Buddhism, Jainism, Christianity, Islam, and Sikhism. Emphasis will be placed on the study of scriptures of these traditions and their continuing global relevance, particularly in American history and culture. Cross-listed with ASIA 232. Graduate/Undergraduate version: RELI 500. Not offered this academic year. Instructor(s): Kripal.

**RELI 240 BLACK RELIGIOUS THOUGHT (3)**

This course will examine 20th century Black religious thought and its influence on Black life and praxis. The course is structured thematically. The themes are: Black Nationalism, Christianity Inspired Praxis, Black Existentialism and Humanism. We will explore central themes such as evil, suffering, scriptural imagery, and liberation. Graduate/Undergraduate version: RELI 550. Limited enrollment. Not offered this academic year. Instructor(s): Pinn.

**RELI 243 THE BOOK OF GENESIS (3)**

A critical reading in English of the Book of Genesis with close attention to the narrative artistry and theological dimensions of the text. Compares pre-modern modes of interpretation and modern historical criticism. Not offered this academic year. Instructor(s): Henze.

**RELI 250 MEDITATION, MYSTICISM, AND MAGIC (3)**

The course moves between Buddhist religious and Western psychological literature, analyzing these as models of human development, as guides to a meditative life or critiques of it, and above all as expressions of deeply rooted cultural proclivities. Reading Freud, Milarepa, Norbu, Obeyesekere, Sutric and Tantric literature, Taylor and Wangyal. Cross-listed with ASIA 250. Not offered this academic year. Instructor(s): Klein; Parsons.

**RELI 260 RELIGION & THE SOCIAL SCIENCES (3)**

Designed to introduce the student to classic and contemporary texts in the social scientific study of religion. Topics include: mysticism, the social construction of gender, the guru-disciple relationship, secularization, healing traditions East and West, cross-cultural debates. Course equivalency: RELI 336. Limited enrollment. Offered Spring. Instructor(s): Parsons.

**RELI 262 INTRODUCTION TO MYSTICISM (3)**

Familiarize the student with diverse texts (secular and religious, East and West) found in mystical literature. Emphasis will be placed on psychological, philosophical and comparative methods. Course equivalency: RELI 337. Graduate/Undergraduate version: RELI 337, RELI 582. Limited enrollment. Not offered this academic year. Instructor(s): Parsons.

**RELI 270 INTRODUCTION TO THE BLACK CHURCH IN THE UNITED STATES (3)**

Much of what has historically taken place within Black communities has been shaped by Black Christian churches. These churches are resources for those interested in understanding religious expression and activism within the Black community. This course provides an introduction into the history, thought, and worship of the major Black denominations. Offered Fall. Instructor(s): Pinn.

**RELI 280 SEARCH FOR GOD (3)**

Explore forms of theistic religious experience, concentrating on the Western Christian tradition; past and present cultural and philosophical challenges to traditional religious belief; the possibility of Christian faith and the struggle for justice and meaning. Course equivalency: RELI 390. Not offered this academic year. Instructor(s): Stroup.

**RELI 282 INTRODUCTION TO CHRISTIANITY (3)**

Multidisciplinary exploration of Christian religious experience, belief, and social reality with examples from Africa, the Americas, Asia, and Europe during the last two thousand years. Themes include search for lasting marks of identity amid change and diversity as well as the issue of Christianity's relation to processes of modernization and secularization. No prior background in religious studies required. Offered Fall. Instructor(s): Bongmba; Stroup.

**RELI 286 THE REFORMATION & ITS RESULTS (3)**

Theology and church-state issues from 16th-century Reformation to 17th century; medieval background; Luther and Calvin, the Catholic Reformation; religious wars; Protestant orthodoxy; Pietist spirituality; Puritanism; and calls for toleration. Course equivalency: RELI 391. Offered Spring. Instructor(s): Stroup.

**RELI 294 RELIGION IN FICTION AND FILM (3)**

The sacred in inter-religious, international, and interdisciplinary encounter, approached via social sciences, theology, theories of literature and mythology. Authors and directors can include Waugh, Mishima, Mann, Proust, Hesse, Percy, Gardner, Updike, Gibson, Sterling, Coupland, Ray, Resnais, Fellini, Bergman, Anderson, Bunnell, and Nutley. Graduate/Undergraduate version: RELI 514. Not offered this academic year. Instructor(s): Stroup.

**RELI 301 NIETZSCHE AND RELIGIOUS THOUGHT (3)**

Nietzsche's thought and background: his impact on religious thinkers and cultural critics; his influence on understanding of God, faith, values, society; his connection with Schopenhauer, Wagner, Tillich, Mann, Barth, Buber, Freud, Jung, D.H. Lawrence, Heidegger, antibourgeois cultural criticism, environmentalism, feminism, and postmodernism. Graduate/Undergraduate version: RELI 515. Offered Spring. Instructor(s): Stroup.

**RELI 303 THE CRAFT OF RELIGIOUS STUDIES (3)**

This course is an advanced survey that introduces the components of studying religion: textual interpretation, traditions and cultures, methodological analysis, and reflection on values. It is required for Religious Studies majors and encouraged for non-majors. Offered Fall. Instructor(s): Kaplan.

**RELI 304 JESUS AND THE GOSPELS (3)**

Explores the various portraits of Jesus in the New Testament and extra-canonical gospels (including the gospels of Thomas Philip, Mary and Judas) in order to reconstruct each gospel's Christological interpretation of Jesus as well as the "historical" Jesus himself. Not offered this academic year.

**RELI 306 SEXUALITY & EARLY CHRISTIANITY (3)**

Studies the development of attitudes toward sexuality and the body in many varieties of early Christianity. A historical-critical and feminist study of biblical texts will be made, as well as extracanonical materials from Nag Hammadi, the Church Fathers, the Apocryphal Acts, and the monastic literature. Not offered this academic year. Instructor(s): Dupree.

**RELI 307 INTRODUCTION TO COPTIC LANGUAGE I (3)**

A first semester introduction to Coptic grammar and vocabulary. Graduate/Undergraduate version: RELI 591. Offered Fall. Instructor(s): DeConick.

**RELI 308 INTRODUCTION TO COPTIC LANGUAGE 2 (3)**

Second semester introduction to Coptic grammar and vocabulary, with selected readings from the Coptic New Testament, Nag Hammadi, and monastic literature. Pre-requisite: Introduction to Coptic Language I. Graduate/Undergraduate version: RELI 592. Pre-requisite(s): RELI 307. Offered Spring. Instructor(s): DeConick.

**RELI 309 CANONICAL GOSPELS: NARRATIVE AND SOCIAL SETTING (3)**

Varied readings in original language to include the New Testament, Nag Hammadi, and monastic literature. Prerequisite: Coptic I and 2. Graduate/Undergraduate version: RELI 593. Repeatable for Credit. Limited enrollment. Not offered this academic year.

**RELI 310 CHRISTIAN CONTROVERSIES & CREEDS FROM THE BIBLE TO CHALCEDON (3)**

Traces the development of the major doctrinal traditions that gained authoritative status within the ancient Church from the Bible to the Council of Chalcedon. These traditions are the result of dialogue and controversy between Christians including the Church Fathers, Jewish Christians, Gnostics, Arians and Nestorians. Graduate/Undergraduate version: RELI 594. Instructor(s): DeConick.

**RELI 311 RELIGION AND HIP HOP CULTURE IN AMERICA (3)**

Hip Hop culture has changed how life is discussed and conducted. However, one of the under-explored dimensions of Hip Hop culture involves its religious sensibilities. Using lectures and discussion, this course explores Hip Hop culture's religious dimensions through the musical language of rap. Not offered this academic year. Instructor(s): Pinn.

**RELI 312 THE RELIGIOUS THOUGHT OF MARTIN L. KING, JR. AND MALCOLM X (3)**

Although many figures played a prominent role during the Civil Rights Movement, Martin L. King, Jr. and Malcolm X made unique contributions. Their work sparked important conversation concerning the methods, goals, and consequences of struggle toward liberation. This course examines their religiosity, theological sensibilities, and the major themes, which surface in their writings and public work. Graduate/Undergraduate version: RELI 546. Not offered this academic year. Instructor(s): Pinn.

**RELI 315 GENDER AND ISLAM (3)**

Explores the lives of Muslim women in Asia, the Middle East, Europe, and North America; analyze constructions of gender in the Islamic world over time, the challenges faced from such diverse quarters as colonial administrators, Western feminists, and states, as well as movements and individuals within the Muslim world. Cross-listed with SWGS 315. Limited enrollment. Not offered this academic year. Instructor(s): Shehabuddin.

**RELI 322 INTRODUCTION TO BUDDHISM (3)**

Exploration of the Buddhist traditions of India, Tibet, China, and Japan, emphasizing the relationship between styles of meditation, their philosophical perspectives, cultural context, and classic Buddhist texts. Cross-listed with ASIA 322. Graduate/Undergraduate version: RELI 572. Not offered this academic year. Instructor(s): Klein.

**RELI 323 THE KNOWING BODY: BUDDHISM, GENDER AND THE SOCIAL WORLD (3)**

Western thought tends to regard mind and body dualistically, a view with significant impact on religious cultural, gendered and social processes. This course juxtaposes received Western assumptions with Buddhist perspectives (especially Tibetan Buddhist), mapping Western and Buddhist categories onto each other to better understand the implications of each. Cross-listed with ASIA 323, SWGS 323. Graduate/Undergraduate version: RELI 577. Not offered this academic year. Instructor(s): Klein.

**RELI 328 TANTRA IN COMPARATIVE PERSPECTIVE (3)**

Examine the development of Hindu and Buddhist Tantric traditions in India, and explore their dissemination to Tibet and East Asia. Focus on the issues of power, gender, and sexuality as negotiated by these traditions. Also, explore their modern transmissions to the West. Graduate/Undergraduate version: RELI 528. Repeatable for Credit. Not offered this academic year.

**RELI 330 ETHICS IN JUDAISM (3)**

What-if anything-is right, good, and just about our intentions and actions? The course surveys urgent questions raised in Jewish philosophy concerning law, morality, and politics. Topics include freedom and frailty, gender and government, emotion and reasons, suffering and hope. Readings in translation ancient, medieval, modern, and contemporary writings. RELI 330: Requires an additional original research paper. Course equivalency: RELI 210. Limited enrollment. Instructor(s): Kaplan.

**RELI 333 KNOWING BODY/GLOWING MIND: BUDDHIST ARTS OF CONTEMPLATION AND ANALYSIS (3)**

Buddhism is a performing art engaging both mind and body. Our course investigates Buddhist and other literature, epistemology and rituals with an eye to how they speak to contemplative practice. Contemplative practice itself, in class and out, supplements our exploration of the interplay between traditional Asian and contemporary Western perspectives. Graduate/Undergraduate version: RELI 573. Recommended prerequisite(s): One course in Buddhism. Repeatable for Credit. Limited enrollment. Not offered this academic year. Instructor(s): Klein.

**RELI 334 PSYCHOLOGY OF RELIGION (3)**

An overview of the basic approaches in the psychological understanding of religious belief and practice. Topics to be addressed in religious systems East and West include: sex, religious experience, ritual, myth, saintliness, guilt, God and meditation. Not offered this academic year. Instructor(s): Parsons.

**RELI 336 RELIGION & THE SOCIAL SCIENCES (3)**

Designed to introduce the student to classic and contemporary texts in the social scientific study of religion. Topics include: mysticism, the social construction of gender, the guru-disciple relationship, secularization, healing traditions East and West, cross-cultural debates. Additional written work. Course equivalency: RELI 260. Limited enrollment. Instructor(s): Parsons.

**RELI 337 INTRODUCTION TO MYSTICISM (3)**

Familiarize the student with diverse texts (secular and religious, East and West) found in mystical literature. Emphasis will be placed on psychological and comparative methods. Write additional term paper of 15 pages. Course equivalency: RELI 262. Graduate/Undergraduate version: RELI 262, RELI 582. Limited enrollment. Not offered this academic year. Instructor(s): Parsons.

**RELI 338 THE CHURCH OF AFRICA (3)**

A reading course designed to examine Christianity in Africa. Course materials and readings will address the development of the church from the Patristic era to the present, paying attention to theological developments, missionization, colonialism, nationalism, prophetic movements, race relations, the role of women, and social issues. Graduate/Undergraduate version: RELI 540. Limited enrollment. Not offered this academic year. Instructor(s): Bongmba.

**RELI 340 THEOLOGY IN AFRICA (3)**

Introductory readings to theological thinking in Africa from the Patristic period to the present. Course will address methodological issues as well as constructive theological work on inculturation and liberation. Offered Fall. Instructor(s): Bongmba.

**RELI 342 NEW RELIGIOUS MOVEMENTS IN AFRICA (3)**

Discusses new religious movements and the religious, sociological, and political factors leading to their rise, also missionary and colonial reactions to them. Examines their relationship to indigenous religions, political praxis, their focus on this-worldly salvation in the wake of political and economic marginality. Cross-listed with ANTH 343. Not offered this academic year. Instructor(s): Bongmba.

**RELI 346 LIBERATION THEOLOGIES II: A GLOBAL PERSPECTIVE (3)**

Through readings, lectures, and class discussions, this course provides a survey of liberation theologies outside the United States. Primary attention is given to liberation theologies in Africa, Asia, South America, and the United Kingdom. Graduate/Undergraduate version: RELI 549. Not offered this academic year. Instructor(s): Pinn; Bongmba.

**RELI 348 CHRISTIANITY AND ISLAM IN AFRICA (3)**

This course will focus upon the history and conflict of Christianity and Islam in Africa, with emphasis placed upon indigenous African developments, cultural and artistic themes, and conversion narratives as well as exploring the co-existence and conflict of the two major faiths of the continent. Graduate/Undergraduate version: RELI 536. Not offered this academic year. Instructor(s): Bongmba; Cook.

**RELI 352 JIHAD AND THE END OF THE WORLD (3)**

The course will explore the connections between Jihad (both aggressive and non-aggressive) and apocalyptic beliefs in the Muslim tradition from the time of the Prophet Muhammad until the present day. Readings from the Qur'an, Bukhari, Ayatullah al-Khumayni, and Sayyid Qutb. Not offered this academic year. Instructor(s): Cook.

**RELI 355 RELIGION AND SOCIAL CHANGE IN SOUTH ASIA (3)**

The course will explore connections between religion and social and historical change in Colonial and Post-Colonial South Asia, with a focus on Hindu, Buddhist and Shia Muslim communities in India, Sri Lanka and Nepal. Particular attention will be given to issues of religious identity and inter-religious conflict. Cross-listed with ASIA 355. Not offered this academic year. Instructor(s): Cook.

**RELI 356 MAJOR ISSUES IN CONTEMPORARY ISLAM (3)**

This course will focus on the major issues confronting contemporary Islam including Islamic unity, the place of the Qur'an and traditions, human rights, Islamic feminism, da'wa, education, science and Islam, globalization and medical ethics. Offered Fall. Instructor(s): Cook.

**RELI 358 HUMOR AND ENTERTAINMENT IN ISLAMIC SOCIETIES (3)**

This course investigates humor and entertainment in Islamic societies from the early Islamic period to the 20th century. We will read and discuss texts from the Arabic, Persian, and Turkish literary traditions, and analyze their genres and entertainment values. Cross-listed with HIST 359. Offered Spring. Instructor(s): Cook; Sanders.

**RELI 361 THE ORIENTAL RENAISSANCE (3)**

This course will explore the European and American encounters with India from 17th-century France to 20th-century America. Particular attention will be given to the translation of texts, the English and German Romantic traditions, the depth psychology of C.G. Jung, and the American New Age. Cross-listed with ASIA 361. Not offered this academic year. Instructor(s): Kripal.

**RELI 362 AESTHETICS AND HERMENEUTICS: MODERN ART, MYSTICAL EXPERIENCE, AND TEXTUAL INTERPRETATION (3)**

Sacred texts and the visual arts have contributed immeasurably to shaping individual and collective conceptions of the spiritual in modern and postmodern culture. This course will examine a range of aesthetic and hermeneutic traditions, including mystical texts, modernist artworks and related museum exhibitions, in order to consider the ways in which the experiences of reading, writing, and viewing can serve as powerful acts of self-creation. Cross-listed with HART 393. Graduate/Undergraduate version: RELI 502. Limited enrollment. Offered Fall. Instructor(s): Brennan; Kripal.

**RELI 365 NEW TESTAMENT & CHRISTIAN ORIGINS (3)**

Examines the growth of Christianity from its origins as a Jewish group to a religion in the mid-second century that distinguished itself from Judaism. Includes discussion of Acts, Paul's letters, Johannine corpus, Gospel of Thomas, Pastorals, Catholic letters, Hebrews, and Revelation. Graduate/Undergraduate version: RELI 595. Not offered this academic year. Instructor(s): DeConick

**RELI 370 MEDICINE, MEANING, & MORALITY (3)**

Introduce students to the medical humanities -- a relatively new field that addresses moral, legal, spiritual and religious problems spawned by the rise of high-tech medicine and high-stakes biomedical research. Materials include clinical case studies, film, and reader's theatre as well as historical, philosophical, literary, and theological writings. Graduate/Undergraduate version: RELI 542. Limited enrollment. Offered Spring. Instructor(s): Cole.

**RELI 371 MODERN JEWISH THOUGHT (3)**

What is the role of God and spirituality in the modern world? How do modern Jewish thinkers reinterpret traditional religious concepts? Explore debates on textual criticism, historical representation, existentialism, and political theology in writings by Spinoza, Buber, Rosenzweig, Kook, Levinas, and Adler. Graduate/Undergraduate version: RELI 561. Not offered this academic year. Instructor(s): Kaplan.

**RELI 373 JEWISH MYSTICISM (3)**

Surveys the historical development and central themes of Jewish mysticism. Moving from ancient Gnosticism to medieval Kabbalah to modern Hasidism, we critically reflect on the divine presence in the world, the cultivation of insight and magical powers, contemplative and restorative practices, charismatic authority, the anti-legalism of spiritual growth. Graduate/Undergraduate version: RELI 562. Instructor(s): Kaplan.

**RELI 374 ART & RELIGION IN CHINA (3)**

This introductory course examines the complex relationship between art and religion in China (1st - 19th centuries). Through an analysis of painting, sculpture, cave temples, steles, manuscripts, talismans, illustrated prints, and primary sources, we will explore the visual, religious and cultural dimensions of Buddhism and Daoism, and the fluid nature of Chinese culture. Cross-listed with ASIA 374, HART 374. Not offered this academic year. Instructor(s): Huang

**RELI 381 THE MESSIAH (3)**

Examines the historical origins of Messianism. The Hebrew Bible, the Dead Sea Scrolls, and other ancient texts reflect a surprising diversity of Messianic expectations in early Judaism. These form the background of early Christian depictions of Jesus of Nazareth. Limited enrollment. Not offered this academic year. Instructor(s): Henze.

**RELI 383 THE DEAD SEA SCROLLS (3)**

A survey of the Dead Sea Scrolls as a window into the Second Temple period. A close reading of the scrolls will lead to a discussion of the theological and historical issues of the time, a period pivotal for the formation of Rabbinic Judaism and Early Christianity. Graduate/Undergraduate version: RELI 553. Not offered this academic year. Instructor(s): Henze.

**RELI 385 GOD, TIME AND HISTORY (3)**

How is the passage of time given meaning, and what role--if any--is assigned to divinity in shaping the direction of events? Course explores various forms of recording and interpreting events, drawing from ancient Mesopotamia, Israel, and the Greco-Roman world--the cultures in which modern ideas of history began. Cross-listed with HIST 381. Graduate/Undergraduate version: RELI 585. Not offered this academic year. Instructor(s): Henze; Maas.

**RELI 390 SEARCH FOR GOD IN THE POSTMODERN WORLD (3)**

Explore forms of theistic religious experience, concentrating on the Western Christian tradition; past and present cultural and philosophical challenges to traditional religious belief; the possibility of Christian faith and the struggle for justice and meaning. RELI 390: Additional 10-page research paper required. Course equivalency: RELI 280. Limited enrollment. Instructor(s): Stroup.

**RELI 391 REFORMATION & ITS RESULTS (3)**

Theology and church-state issues from 16th-century Reformation to 17th-century; medieval background; Luther and Calvin, the Catholic Reformation; religious wars; Protestant orthodoxy; Pietist spirituality; Puritanism; and calls for toleration. RELI 391: Additional 15-page paper required. Course equivalency: RELI 286. Limited enrollment. Instructor(s): Stroup.

**RELI 400 HONORS IN RELIGIOUS STUDIES (3 TO 6)**

Honors thesis. Enrollment by approval. Instructor permission required. Offered Fall & Spring.

**RELI 401 INDEPENDENT STUDY (1 TO 6)**

Multiple sections of this course are offered. Repeatable for Credit. Offered Fall.

**RELI 402 INDEPENDENT STUDY (1 TO 6)**

Multiple sections of this course are offered. Repeatable for Credit. Offered Spring.

**RELI 410 APOCALYPSE THEN AND NOW (3)**

A close reading and discussion of three apocalypses from the biblical period: 1 Enoch, 2 Baruch, and Revelation. Concludes with a discussion of contemporary forms of apocalypticism. Graduate/Undergraduate version: RELI 510. Not offered this academic year. Instructor(s): Henze.

**RELI 423 AFRICAN MYTHS & RITUALS (3)**

Explore and analyze specific myths and rituals which provide legitimation for community ceremonies and which serve as basis for the negotiation of power and ideology for members within that community. Readings from classic theorist: Gennap & Turner; and contemporary theorists: Werbner, Heusch, Comaroff and Ray. Cross-listed with ANTH 423. Graduate/Undergraduate version: RELI 537. Not offered this academic year. Instructor(s): Bongmba.

**RELI 424 RELIGION AND POLITICS IN AFRICA (3)**

This course explores religion and politics in Africa focusing on indigenous religions, Christianity, Islam, etc. Readings highlight historical developments, key documents in religion and politics, contemporary issues such as: religious freedom, separation of religion and politics, human rights, violence, race, gender, class, and the role of religion in reconstruction of public praxis. Graduate/Undergraduate version: RELI 534. Instructor permission required. Limited enrollment. Offered Spring. Instructor(s): Bongmba.

**RELI 425 AFRICANA PHILOSOPHY & THOUGHT (3)**

Read, discuss, and analyze African, African American, Caribbean, and other African Diaspora existential thought and philosophy. Explore history of philosophy in that context and major philosophical issues and voices. Graduate/Undergraduate version: RELI 535. Limited enrollment. Instructor(s): Bongmba.

**RELI 426 RELIGION AND LITERATURE IN AFRICA (3)**

Analysis of the religious imagination and gender issues in postcolonial literature in Africa focusing on Islam, Christianity, indigenous religions and African Initiated Churches. Religious and gender issues addressed include identity crises, power, class of cultures, modernity, cosmology, community, and socio-religious conflicts in a postcolonial world. Graduate/Undergraduate version: RELI 538. Not offered this academic year. Instructor(s): Bongmba.

**RELI 429 DEPARTMENT SEMINAR (3)**

The team-taught Department Seminar critically examines the methodological questions and interpretive paradigms that have been central to the academic study of religion. Philosophical, ethical, textual, psychological, comparative and gender issues, among others, will be considered. Instructors and topics vary. Mandatory for graduate students; majors by invitation. Graduate/Undergraduate version: RELI 529. Repeatable for Credit. Offered Spring.

**RELI 430 RELIGION & MODERN THERAPIES (3)**

A survey of the historical development of the psychology of religion and its conversation with theology, comparative studies, gender studies, sociology, and anthropology. Topics include: mysticism, eroticism, conversion, feminism, psychobiography. Examples drawn from a variety of religious traditions. Readings include: Freud, Jung, Tillich, Erikson, Kristeva, Kakar. Graduate/Undergraduate version: RELI 584. Instructor permission required. Offered Fall. Instructor(s): Parsons.

**RELI 440 ISLAM'S MYSTICAL AND ESOTERIC TRADITION (3)**

Explores the ascetic and Sufi aspects of Islam from the middle Islamic period until the present day. Readings from al-Ghazali, Ibn al-Arabi, Sa'di, Hafiz and Rumi. Graduate/Undergraduate version: RELI 522. Not offered this academic year. Instructor(s): Cook.

**RELI 441 MAGIC AND POPULAR RELIGION (3)**

This course will examine the popular religion in the Middle East from Late Antiquity until the 19th century, focusing on healing practices, astrology, protection, amulets, seasoned/life-cycle rituals, and other popular beliefs common to Islam, Judaism and Christianity. Cross-listed with ASIA 441. Graduate/Undergraduate version: RELI 525. Offered Fall. Instructor(s): Cook.

**RELI 443 MAIMONIDES "GUIDE FOR THE PERPLEXED" (3)**

This course will closely read the classic text of Judeo- Muslim thought, Maimonides Guide for the Perplexed, in its historical philosophical and literary context. It will draw upon additional Jewish and Muslim sources as well. Graduate/Undergraduate version: RELI 565. Not offered this academic year. Instructor(s): Cook.

**RELI 451 PHILOSOPHIES & THEOLOGIES OF HISTORY (3)**

Modern thought on meaning, direction of history; roots in eschatology, Augustine; flowering in progress, historicism: Hegel, Ranke, Burckhardt, Nietzsche, Troeltsch, Spengler, Heidegger, Toynbee; cultural echo (de Chirico, Proust, Mann, Robbe-Grillet, Bu^uel, Bergman, Fellini). Graduate/Undergraduate version: RELI 517. Offered Fall. Instructor(s): Stroup.

**RELI 456 HISTORY OF WESTERN CHRISTIANITY: REFORMATION TO THE PRESENT (3)**

Spirituality, sociopolitical movements, and intellectual life in the West. Includes Luther, Calvin, Kierkegaard, Bonhoeffer, Barth, C.S. Lewis, Tillich, Marx, Nietzsche, and Jung. Graduate/Undergraduate version: RELI 520. Not offered this academic year. Instructor(s): Stroup.

**RELI 457 MODERNITY, ANTI- AND POSTMODERNITY (3)**

Modernity, Antimodernity, & Postmodernity as Styles of Religiosity. Exploration of the problem of defining "modernity" and concepts. Includes contemporary sociological, political, and cultural theory (e.g. Baudrillard) in connection with typologies of religious experience and grouping from mainline through New Age. Graduate/Undergraduate version: RELI 519. Not offered this academic year. Instructor(s): Stroup.

**RELI 462 MEDICAL ETHICS AND AMERICAN VALUES I (3)**

Readings and discussion of the principles and priorities of medical ethics, with attention to historical development. Taught in conjunction with University of Texas-Houston Health Science Center. Classes meet at UT School of Public Health. Intended only for highly qualified undergraduates. Graduate/Undergraduate version: RELI 543. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Reiser; Slomka.

**RELI 464 REPRESENTING EVIL (3)**

This course explores myriad ways evil has gotten represented in arts and letters, through history and around the globe, concentrating on literary fiction but also considering other media. It addresses how human cultures shape and are shaped by appeal to God or gods for the justification of suffering. Graduate/Undergraduate version: RELI 564. Offered Spring. Instructor(s): Kaplan; Pinn.

**RELI 468 GERMAN-JEWISH IDEALISM AND ITS CRITICS (3)**

From the 18th century until 1933, writers imagined a symbiosis of Judaic and German philosophical and cultural ideas. Were they tragically deluded or guardedly optimistic? Discuss skepticism, romanticism, historicism, ethical monotheism, critical theory, and neo-conservatism. Readings selected from Mendelssohn, Spinoza, Cohen, Buber, Rosenzweig, Scholem, Benjamin, Arendt, and Strauss. Graduate/Undergraduate version: RELI 568. Not offered this academic year. Instructor(s): Kaplan.

**RELI 470 BUDDHIST WISDOM TEXTS (3)**

Indo-Tibetan analyses of the mind and its functions, especially differing views on the role of reasoning and the nature of the "ultimate" in major philosophical schools of Tibet and India. Graduate/Undergraduate version: RELI 570. Offered Fall. Instructor(s): Klein.

**RELI 480 SEXUALITY, SANCTITY, AND PSYCHOANALYSIS (3)**

An advanced mapping of the psychoanalytic study of religion through a close reading of psychoanalytically informed studies of saints, founding figures, and charismatic teachers, with a particular focus on sexuality and gender and their relationship to the expression and representation of holiness in the history of religions. Cross-listed with SWGS 470. Graduate/Undergraduate version: RELI 580. Limited enrollment. Not offered this academic year. Instructor(s): Kripal; Parsons.

**RELI 481 GNOSTIC GOSPELS SEMINAR (3)**

Examines the second century's great debate between the Gnostic Christians and their opponents, the Christians who later became known as the "orthodox". The conflict concerned ideas about "correct" interpretations of the nature of Jesus and his relationship to God and the world. Nag Hammadi texts as well as Patristic literature will be analyzed by individual students. Limited enrollment. Not offered this academic year. Instructor(s): DeConick.

**RELI 490 AFRICAN AMERICAN LITERATURE AND RELIGION (3)**

In this seminar, students will read and analyze African American literature in order to explore the various ways in which African Americans have understood and articulated the nature and meaning of African American religious experience and practice. Graduate/Undergraduate version: RELI 590. Limited enrollment. Not offered this academic year. Instructor(s): Pinn.

**RELI 491 THEORY AND METHOD IN THE STUDY OF BLACK RELIGION (3)**

Through an intense reading and analysis of select text, this seminar will give attention to "tools" for the study of Black religion made available through, for example, History of Religions, Philosophy of Religion (Pragmatism and the "Prophetic"), Phenomenology, Constructive Theology, Process Studies, and Social/Cultural History; Sociology of Religion. Graduate/Undergraduate version: RELI 545. Limited enrollment. Offered Spring. Instructor(s): Pinn.

**RELI 500 RELIGIONS FROM INDIA (3)**

Graduate/Undergraduate version: RELI 232. Not offered this academic year. Instructor(s): Kripal.

**RELI 501 THE ORIENTAL RENAISSANCE (3)**

This course will explore the European and American encounters with India from 17th-century France to twentieth-century America. Particular attention will be given to the translation of Sanskrit texts, the English and German Romantic traditions, the depth psychology of C.G. Jung, and the American New Age. Not offered this academic year. Instructor(s): Kripal.

**RELI 502 AESTHETICS AND HERMENEUTICS: MODERN ART, MYSTICAL EXPERIENCE, AND TEXTURAL INTERPRETATION (3)**

Graduate/Undergraduate version: RELI 362. Offered Fall. Instructor(s): Brennan; Kripal.

**RELI 504 JESUS AND THE GOSPELS (3)**

Explores the various portraits of Jesus in the New Testament and extra-canonical gospels (including the gospels of Thomas Philip, Mary and Judas) in order to reconstruct each gospel's Christological interpretation of Jesus as well as the "historical" Jesus himself. Additional readings, research and writing required at the graduate level. Graduate/Undergraduate version: RELI 234. Not offered this academic year.

**RELI 505 THE ENLIGHTENMENT OF THE BODY (3)**

Beginning with a historical survey of the American metaphysical tradition, this course turns to a close study of the Esalen Institute in Big Sur, CA, as a unique window to some of the different ways tradition has appropriated Asian religions, psychological models of the unconscious, and contemporary scientific paradigms. Graduate/Undergraduate version: RELI 231. Not offered this academic year. Instructor(s): Kripal.

**RELI 506 ASIAN RELIGIONS IN AMERICA (3)**

A survey course on Hinduism, Buddhism, Taoism, and Jainism in America, from the colonial period to the present, with a special focus on American metaphysical religion, the counterculture, the New Age, and the history of Western colonialism, transcultural encounter, translation, and immigration. Graduate section requires additional readings and research papers. Not offered this academic year.

**RELI 510 APOCALYPSE THEN AND NOW (3)**

Graduate/Undergraduate version: RELI 410. Not offered this academic year. Instructor(s): Henze.

**RELI 514 RELIGION IN FICTION AND FILM (3)**

Graduate/Undergraduate version: RELI 294. Not offered this academic year. Instructor(s): Stroup.

**RELI 515 NIETZSCHE AND RELIGIOUS THOUGHT (3)**

Graduate/Undergraduate version: RELI 301. Offered Spring. Instructor(s): Stroup.



- RELI 517 PHILOSOPHIES AND THEOLOGIES OF HISTORY (3)**  
Graduate/Undergraduate version: RELI 451. Offered Fall. Instructor(s): Stroup.
- RELI 519 MODERNITY, ANTIMODERNITY & POSTMODERNITY AS STYLES OF RELIGIOSITY (3)**  
Graduate/Undergraduate version: RELI 457. Not offered this academic year. Instructor(s): Stroup.
- RELI 520 HISTORY OF WESTERN CHRISTIANITY: REFORMATION TO THE PRESENT (3)**  
Graduate/Undergraduate version: RELI 456. Not offered this academic year. Instructor(s): Stroup.
- RELI 521 ADVANCED STUDY OF ISLAM (3)**  
The purpose of this course will be to give graduate students a working knowledge of Islam historically and religiously. Not offered this academic year. Instructor(s): Cook.
- RELI 522 ISLAM'S MYSTICAL AND ESOTERIC TRADITION (3)**  
Graduate/Undergraduate version: RELI 440. Not offered this academic year. Instructor(s): Cook.
- RELI 523 INDEPENDENT STUDY (1 TO 15)**  
Multiple sections of this course are offered. Repeatable for Credit. Offered Fall.
- RELI 524 INDEPENDENT STUDY (1 TO 9)**  
Multiple sections of this course are offered. Repeatable for Credit. Offered Spring.
- RELI 525 MAGIC AND POPULAR RELIGION (3)**  
Graduate/Undergraduate version: RELI 441. Offered Fall. Instructor(s): Cook.
- RELI 526 JIHAD & THE END OF THE WORLD (3)**  
This course will explore the connections between Jihad (both aggressive and non-aggressive) and apocalyptic beliefs in the Muslim tradition from the time of the Prophet Muhammad until the present day. Readings from the Qur'an, Bukhari, Ayatullah al-Khumayni, and Sayyid Qutb. RELI 526: Write 25-page paper and teach 1-2 class sessions. Not offered this academic year.
- RELI 528 TANTRA IN COMPARATIVE PERSPECTIVES (3)**  
Graduate/Undergraduate version: RELI 328. Not offered this academic year.
- RELI 529 DEPARTMENT SEMINAR (3)**  
Graduate/Undergraduate version: RELI 429. Repeatable for Credit. Offered Spring.
- RELI 530 PEDAGOGY PRACTICUM (2)**  
As an integral part of the department's apprenticeship program, this is a semester-long practicum through which a graduate student apprentices with a faculty member teaching an undergraduate course in order to be trained in all aspects of course design, lecturing, advising, and grading. Required of all graduate students. Graduate/Undergraduate version: RELI 403. Instructor permission required. Repeatable for Credit. Offered Fall & Spring.
- RELI 531 INTRODUCTION TO TIBETAN LANGUAGE AND CULTURE (3)**  
Varied topics include traditional Buddhist texts as well as modern reflections on Tibet, film, and foundations of the Tibetan language. This course will write a paper approximately one-third longer than the undergraduate equivalent course, and complete a more substantial oral presentation. Graduate/Undergraduate version: RELI 131. Repeatable for Credit. Offered Fall.
- RELI 532 ADVANCED TIBETAN LANGUAGE AND CULTURE (3)**  
Graduate/Undergraduate version: RELI 132. Recommended: Basic reading ability in Tibetan. Repeatable for Credit. Offered Spring.
- RELI 534 RELIGION AND POLITICS IN AFRICA (3)**  
The course explores religion and politics in Africa focusing on indigenous religions, Christianity, Islam, etc. Readings highlight historical developments, key documents in religion and politics, contemporary issues such as: religious freedom, separation of religion and politics, human rights, violence, race, gender, class, and the role of religion in reconstruction of public praxis. Graduate/Undergraduate version: RELI 424. Instructor permission required. Recommended prerequisite(s): Basic reading ability in Tibetan. Limited enrollment. Offered Spring. Instructor(s): Bongmba.
- RELI 535 AFRICANA PHILOSOPHY & THOUGHT (3)**  
Read, discuss, and analyze African, African American, Caribbean, and other African Diaspora existential thought and philosophy. Explore history of philosophy in that context and major philosophical issues and voices. Write 2 book reviews (5 pages), do a presentation in one area (African, African American, Caribbean philosophy), and write a research paper on a significant issue on Africana philosophy demonstrating sophistication in philosophical analysis. Graduate/Undergraduate version: RELI 425. Limited enrollment. Instructor(s): Bongmba.
- RELI 536 CHRISTIANITY AND ISLAM IN AFRICA (3)**  
Graduate/Undergraduate version: RELI 348. Not offered this academic year. Instructor(s): Bongmba; Cook.
- RELI 537 AFRICAN MYTHS AND RITUALS (3)**  
Graduate/Undergraduate version: RELI 423. Not offered this academic year. Instructor(s): Bongmba.

**RELI 538 RELIGION AND LITERATURE IN AFRICA (3)**  
Graduate/Undergraduate version: RELI 426. Not offered this academic year. Instructor(s): Bongmba.

**RELI 540 THE CHURCH OF AFRICA (3)**  
Graduate/Undergraduate version: RELI 338. Not offered this academic year. Instructor(s): Bongmba.

**RELI 542 MEDICINE, MEANING, AND MORALITY (3)**  
Introduce students to the medical humanities -- a relatively new field that addresses moral, legal, spiritual and religious problems spawned by the rise of high-tech medicine and high-stakes biomedical research. Materials include clinical case studies, film, and reader's theatre as well as historical, philosophical, literary, and theological writings. Graduate/Undergraduate version: RELI 370. Limited enrollment. Offered Spring. Instructor(s): Cole.

**RELI 543 MEDICAL ETHICS AND AMERICAN VALUES I (3)**  
Taught in conjunction with University of Texas-Houston Health Science Center. Classes meet at UT School of Public Health. Graduate/Undergraduate version: RELI 462. Instructor permission required. Limited enrollment. Offered Fall. Instructor(s): Reiser; Slomka.

**RELI 545 THEORY AND METHOD IN THE STUDY OF BLACK RELIGION (3)**  
Through an intense reading and analysis of select text, this seminar will give attention to "tools" for the study of Black religion made available through, for example, History of Religions, Philosophy of Religion (Pragmatism and the "Prophetic"), Phenomenology, Constructive Theology, Process Studies, and Social/Cultural History, Sociology of Religion. Graduate/Undergraduate version: RELI 491. Limited enrollment. Offered Spring. Instructor(s): Pinn.

**RELI 546 THE RELIGIOUS THOUGHT OF MARTIN L. KING, JR. AND MALCOLM X (3)**  
Graduate/Undergraduate version: RELI 312. Not offered this academic year. Instructor(s): Pinn.

**RELI 548 LIBERATION THEOLOGIES (3)**  
Graduate/Undergraduate version: RELI 158. Limited enrollment. Not offered this academic year. Instructor(s): Pinn.

**RELI 549 LIBERATION THEOLOGIES II: A GLOBAL PERSPECTIVE (3)**  
Graduate/Undergraduate version: RELI 346. Not offered this academic year. Instructor(s): Pinn; Bongmba.

**RELI 550 BLACK RELIGIOUS THOUGHT (3)**  
Graduate/Undergraduate version: RELI 240. Limited enrollment. Not offered this academic year. Instructor(s): Pinn.

**RELI 552 AFRICAN AMERICAN STUDIES RESEARCH SEMINAR (4)**  
Interdisciplinary graduate research seminar in African American studies. Topics vary. Cross-listed with HIST 560. Not offered this academic year. Instructor(s): Byrd; Cox; Pinn.

**RELI 553 THE DEAD SEA SCROLLS (3)**  
Graduate/Undergraduate version: RELI 383. Not offered this academic year. Instructor(s): Henze.

**RELI 561 MODERN JEWISH THOUGHT (3)**  
Graduate/Undergraduate version: RELI 371. Not offered this academic year. Instructor(s): Kaplan.

**RELI 562 JEWISH MYSTICISM (3)**  
Surveys the historical development and central themes of Jewish mysticism. Moving from ancient Gnosticism to medieval Kabbalah to modern Hasidism, we critically reflect on the divine presence in the world, the cultivation of insight and magical powers, contemplative and restorative practices, charismatic authority, the anti-legalism of spiritual growth. Graduate/Undergraduate version: RELI 373. Offered Fall. Instructor(s): Kaplan.

**RELI 564 REPRESENTING EVIL (3)**  
Graduate/Undergraduate version: RELI 464. Offered Spring. Instructor(s): Kaplan; Pinn.

**RELI 565 MAIMONIDES "GUIDE FOR THE PERPLEXED" (3)**  
Graduate/Undergraduate version: RELI 443. Not offered this academic year. Instructor(s): Cook.

**RELI 568 GERMAN-JEWISH IDEALISM AND ITS CRITICS (3)**  
Graduate/Undergraduate version: RELI 468. Not offered this academic year. Instructor(s): Kaplan.

**RELI 570 BUDDHIST WISDOM TEXTS (3)**  
Graduate/Undergraduate version: RELI 470. Offered Fall. Instructor(s): Klein.

**RELI 572 INTRODUCTION TO BUDDHISM (3)**  
Graduate/Undergraduate version: RELI 322. Not offered this academic year. Instructor(s): Klein.

**RELI 573 KNOWING BODY/GLOWING MIND: BUDDHIST ARTS OF CONTEMPLATION AND ANALYSIS (3)**  
Buddhism is a performing art engaging both mind and body. Our course investigates Buddhist and other literature, epistemology and rituals with an eye to how they speak to contemplative practice. Contemplative practice itself, in class and out, supplements our exploration of the interplay between traditional Asian and contemporary Western perspectives. Graduate/Undergraduate version: RELI 333. Recommended prerequisite(s): One course in Buddhism. Repeatable for Credit. Limited enrollment. Not offered this academic year. Instructor(s): Klein.

- RELI 577 THE KNOWING BODY: BUDDHISM, GENDER, AND THE SOCIAL WORLD (3)**  
Cross-listed with SWGS 577. Graduate/Undergraduate version: RELI 323. Not offered this academic year. Instructor(s): Klein.
- RELI 580 SEXUALITY, SANCTITY, AND PSYCHOANALYSIS (3)**  
Cross-listed with SWGS 580. Graduate/Undergraduate version: RELI 480. Limited enrollment. Not offered this academic year. Instructor(s): Kripal; Parsons.
- RELI 581 Gnostic Gospels Seminar (3)**  
Limited enrollment. Not offered this academic year. Instructor(s): DeConick.
- RELI 582 INTRODUCTION TO MYSTICISM (3)**  
Graduate/Undergraduate version: RELI 262, RELI 337. Not offered this academic year. Instructor(s): Parsons.
- RELI 584 RELIGION & MODERN THERAPIES (3)**  
Graduate/Undergraduate version: RELI 430. Offered Fall. Instructor(s): Parsons.
- RELI 585 GOD, TIME AND HISTORY (3)**  
Graduate/Undergraduate version: RELI 385. Not offered this academic year. Instructor(s): Henze; Maas.
- RELI 586 SEXUALITY & CHRISTIANITY SEMINAR (3)**  
Studies the development of attitudes toward sexuality and the body in many varieties of early Christianity. A historical-critical and feminist study of biblical texts will be made, as well as extracanonical materials from Nag Hammadi, the Church Fathers, the apocryphal Acts, and the monastic literature. Additional research and oral presentation required for graduate students. Not offered this academic year.
- RELI 590 AFRICAN AMERICAN LITERATURE AND RELIGION (3)**  
In this seminar, students will read and analyze African American literature in order to explore the various ways in which African Americans have understood and articulated the nature and meaning of African American religious experience and practice. Graduate/Undergraduate version: RELI 490. Not offered this academic year. Instructor(s): Pinn.
- RELI 591 INTRODUCTION TO COPTIC LANGUAGE I (3)**  
A first semester introduction to Coptic grammar and vocabulary. Select a Coptic text, read in its original language, and prepare a commentary or an exegesis on that text (5,000 words). Graduate/Undergraduate version: RELI 307. Instructor(s): DeConick.
- RELI 592 INTRODUCTION TO COPTIC LANGUAGE 2 (3)**  
Second semester introduction to Coptic grammar and vocabulary, with selected readings from the Coptic New Testament, Nag Hammadi, and monastic literature. Pre-requisite: Introduction to Coptic Language I RELI 591; Select a Coptic text, read in its original language, and prepare a commentary or an exegesis on that text (5,000 words). Graduate/Undergraduate version: RELI 308. Pre-requisite(s): RELI 307. Offered Spring. Instructor(s): DeConick.
- RELI 593 READING COPTIC TEXTS (3)**  
Varied readings in original language to include the New Testament, Nag Hammadi, and monastic literature. Pre-requisite: Coptic 1 and 2. RELI 593: Students will select a Coptic text, and in addition to reading it in its original language, prepare a commentary or an exegesis on that text (5,000 words). Graduate/Undergraduate version: RELI 309. Repeatable for Credit. Not offered this academic year.
- RELI 594 CHRISTIAN CONTROVERSIES & CREEDS FROM THE BIBLE TO CHALCEDON (3)**  
Traces the development of the major doctrinal traditions that gained authoritative status within the ancient Church from the Bible to the Council of Chalcedon. These traditions are the result of dialogue and controversy between Christians including the Church Fathers, Jewish Christians, Gnostics, Arians, and Nestorians. Select a piece of patristic literature and prepare an original commentary or exegesis on that text (5,000 words). Work in original languages is strongly recommended, if not required. Graduate/Undergraduate version: RELI 310. Instructor(s): DeConick.
- RELI 595 NEW TESTAMENT & CHRISTIAN ORIGINS (3)**  
Examines the growth of Christianity from its origins as a Jewish group to a religion in the mid-second century that distinguished itself from Judaism. Includes discussion of Acts, Paul's letters, Johannine corpus, Gospel of Thomas, Pastorals, Catholic letters, Hebrews, and Revelation. RELI 595: Prepare an original thesis on a New Testament text (5,000). Work in original languages is strongly recommended, if not required. Write a lecture about the history of the academic interpretation of the text and present it orally to undergraduates in the course. Graduate/Undergraduate version: RELI 365. Offered Fall. Instructor(s): DeConick.
- RELI 598 RESEARCH SEMINAR (1 TO 3)**  
Graduate students will be mentored collectively in research methods and study topics. Seminar topics and assignments usually are linked to regular course offerings of the faculty member, so that the seminar functions as a research addendum or supplement to a faculty's course offering(s). Instructor permission required. Repeatable for Credit. Offered Spring. Instructor(s): DeConick.

**RELI 599 RESEARCH SEMINAR (1 TO 3)**

Graduate students will be mentored collectively in research methods and study topics. Seminar topics and assignments usually are linked to regular course offerings of the faculty member, so that the seminar functions as a research addendum or supplement to a faculty's course offering(s). Instructor permission required. Repeatable for Credit. Instructor(s): DeConick.

**RELI 700 GRADUATE RESEARCH (1 TO 12)**

Repeatable for Credit. Offered Summer.

**RELI 800 RESEARCH AND THESIS (9)**

Repeatable for Credit. Offered Fall & Spring.

**RUSS (RUSSIAN)****School of Humanities/Center for Study of Languages****RUSS 101 INTRODUCTION TO RUSSIAN I (5)**

An introduction to the fundamentals of Russian grammar and basic conversation topics. Includes pronunciation, reading, oral, aural, and translation practice. Also includes a basic introduction to Russian culture. Recommended prerequisite(s): No prior knowledge of Russian. Offered Fall. URL: lang.rice.edu/Ludwig/russian101/Russian101.html.

**RUSS 102 INTRODUCTION TO RUSSIAN II (5)**

Continuation of RUSS 101. Pre-requisite(s): RUSS 101 or permission of instructor. Offered Spring. URL: lang.rice.edu/Ludwig/russian102/Russian102.html.

**RUSS 201 INTERMEDIATE RUSSIAN I (4)**

A continuation of the fundamentals of Russian grammar and conversation topics. Includes oral, aural, composition, translation, and reading practice. Attention is also given to Russian cultural topics and current events. Pre-requisite(s): RUSS 102 or permission of instructor. Offered Fall. URL: lang.rice.edu/Ludwig/russian201/Russian201.html.

**RUSS 202 INTERMEDIATE RUSSIAN II (4)**

Continuation of RUSS 201. Pre-requisite(s): RUSS 201 or permission of instructor. URL: lang.rice.edu/Ludwig/russian202/Russian202.html.

**RUSS 301 CONVERSATION AND COMPOSITION I (3)**

Focus on reading, listening comprehension and spoken Russian. Also includes discussion of advanced grammar topics. Pre-requisite(s): RUSS 202 or permission of instructor. Offered Fall. URL: lang.rice.edu/Ludwig/russian301/Russian301.html.

**RUSS 302 CONVERSATION AND COMPOSITION II (3)**

Continuation of RUSS 301. Pre-requisite(s): RUSS 301 or permission of instructor. URL: lang.rice.edu/Ludwig/russian302/Russian302.html.

**RUSS 303 SPECIAL TOPICS (3)**

Topics vary. Not offered this academic year. Instructor(s): Ludwig.

**RUSS 450 INDEPENDENT STUDY (3)**

Content varies depending on student interests and the availability of instructors. Repeatable for Credit. Not offered this academic year.

**SLAV (SLAVIC STUDIES)****School of Humanities/German and Slavic Studies****SLAV 242 POLISH DRAMA I (3)**

The reading of Polish 19th- and 20th-century plays with a view to improving student's comprehension of Polish. Equivalent to Second Year Polish. Taught in Polish. Recommended prerequisite(s): PLSH 102 or equivalent. Not offered this academic year.

**SLAV 243 POLISH DRAMA II (3)**

The reading of Polish nineteenth- and twentieth-century plays with a view to improving student's comprehension of Polish. Equivalent to Second Year Polish. Taught in Polish. Not offered this academic year.

**SLAV 303 SPECIAL TOPICS (3)**

Topics change from year to year. Repeatable for Credit. Not offered this academic year.

**SLAV 309 SLAVIC CULTURES (3)**

Interdisciplinary introduction to the main currents of Russian, Czech, and Polish cultures. Key moments in history, social trends, music and the arts, the construction of national mythologies through literature. Not offered this academic year.

**SLAV 310 POLISH DRAMA IN TRANSLATION (3)**

Introduction to Polish drama via translations. Films in Polish, with subtitles, will complement texts. Taught in English. Limited enrollment. Not offered this academic year. Instructor(s): Dabrowska.

**SLAV 320 CONTEMPORARY POLISH AND CENTRAL EUROPEAN POLITICS AND CULTURE (3)**

Intensive study of Polish and Central European popular culture, literature, and the changing tides of politics. Emphasis on the post-communist period. Taught in English. Limited enrollment. Offered Fall. Instructor(s): Dobrovoska.

**SLAV 332 SOVIET AND POST-SOVIET LITERATURE (3)**

The course will provide students with an introduction to 20th century Russian, Soviet, and post-Soviet literature and culture by reading works by authors such as Bulgakov, Zamiatin, Akhmatova, Yetushenko, and Pelevin. Some attention will be paid to 20th-Century film and popular music. Not offered this academic year. Instructor(s): Ludwig.

**SLAV 410 BYZANTUIM AND THE SLAVS IN EUROPEAN HISTORY (3)**

This course is about the marvelous Byzantine Empire, its history and culture in relation to the Slavs. Cross-listed with HIST 309. Limited enrollment. Instructor(s): Dabrowska.

**SLAV 411 MODERN POLISH POETRY IN TRANSLATION (3)**

This course presents the living poets of Poland, from Nobel Prize winners Czeslaw Milosz (1980) and Wislawa Szymborska (1996) to their youngest competitors, Krzysztof Koebler and Maciej Swietlicki. The course explores how resistance and collaboration, Catholicism and Communism, have shaped and continued a major literary tradition of Europe based on a selection of poetry in English translations. Limited enrollment. Offered Fall. Instructor(s): Dabrowska.

**SLAV 412 CENTRAL AND EAST EUROPEAN FILM (3)**

Based on a selection of the best films by the best directors of the region (Forman, Holland, Kieslowski, Polanski, Szabo, Wajda), this course presents Central-Eastern European filmmaking against a background of a totalitarian political system. Limited enrollment. Offered Spring. Instructor(s): Dabrowska.

**SLAV 450 INDEPENDENT STUDY (3)**

Content varies depending on student interests and availability of instructors. Instructor permission required. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Dabrowska.

**SOCI (SOCIOLOGY)****School of Social Sciences/Sociology****SOCI 101 INTRODUCTION TO SOCIOLOGY (3)**

Introduction to the principal concepts, theories and methods of sociology. required (normally) for sociology majors. Course is for Freshmen and Sophomores, but upper classmen can take with permission of instructor. Forms are available in the Department. Department permission required. Limited enrollment. Offered Fall & Spring.

**SOCI 241 THE CRAFT OF SOCIOLOGY (3)**

Exploration of the work of sociology. Includes historical and social origins and development, and its shifting philosophical foundations, methodological refinements, and ethical and political implications, as well as discussion of classic and controversial sociological studies. Not offered this academic year. Instructor(s): Long.

**SOCI 250 SOCIAL THEORY (3)**

This course engages and analyzes the foundational texts of social theory from its classical roots to its contemporary branches. Students will explore theoretical approaches that inform current sociological research and during the course will examine social phenomena of particular interest to them from the perspective of two major theorists. Limited enrollment. Offered Spring. Instructor(s): Lindsay.

**SOCI 275 FEMINIST SOCIAL THOUGHT (3)**

Study of feminist theory as critique and reconstruction. Includes Wollstonecraft and de Beauvoir, as well as contemporary debates about equity, difference, knowledge, sexuality, and power. Cross-listed with SWGS 275. Limited enrollment. Not offered this academic year. Instructor(s): Long.

**SOCI 290 RESEARCH METHODS (3)**

An introduction to the methods sociologists use to study human societies and their members. Hypothesis formulation and research design; qualitative studies through observation and interviews; historical and comparative approaches; sample surveys and the statistical analysis of quantitative data, political and ethical issues in social research. Limited enrollment. Offered Fall. Instructor(s): Emerson.

**SOCI 298 SOCIAL STATISTICS (3)**

Emphasizes the practical uses of statistics to answer the types of questions sociologists ask. We learn sample description, sampling and probability, sampling theory, and how to make inferences from samples to populations. We study and apply common univariate, bivariate, and multivariate statistics. Because most statistical analysis is done with the aid of computers, we also learn how to use a common statistical package. Limited enrollment. Offered Fall. Instructor(s): Bratter.

**SOCI 301 SOCIAL INEQUALITY (3)**

A survey of US inequalities of wealth, status, and power. The situation of various minority groups and social classes. What forms of inequality are unjustifiable? Can they be abolished? If so, how? The trade-off between equality and such valued goods as freedom and efficiency. Limited enrollment. Not offered this academic year.

**SOCI 302 THE GLOBAL POLITICS OF FAMILY AND SEXUALITY (3)**

This class will explore the social effects of post-industrial transformations in family and sexuality within a global context. Central topics and issues include: the politics of marriage and family values, abstinence education and AIDS prevention; the normalization of divorce; reproductive technology; gay and lesbian family formations; trans-racial and transnational families and sexualities. Limited enrollment. Offered Spring. Instructor(s): Heath.

**SOCI 306 SOCIOLOGY OF GENDER (3)**

Relationship between gender and social role. Development of the contemporary sexual division of labor and process of socialization with reference to family, education, media, and occupations. Cross-listed with SWGS 324. Limited enrollment. Not offered this academic year. Instructor(s): Long.

**SOCI 308 HOUSTON: THE SOCIOLOGY OF A CITY (3)**

Houston as an exemplar of contemporary urban change. The "golden buckle of the sunbelt"; recovery from the oil boom collapse of the 1980s into a reconstructional economy and a demographic revolution; the changing politics of education, quality-of-life issues, and interethnic relations, as they interact to shape the urban future. Guest lectures, field trips. Limited enrollment. Offered Spring. Instructor(s): Klineberg.

**SOCI 309 RACE AND ETHNIC RELATIONS (3)**

Historical and contemporary issues and theories of race and ethnic relations in the United States. The key groups covered will be European Americans, African Americans, Native Americans, Asian Americans, and Mexican Americans. Group patterns of assimilation and conflict inform a basic tenet that race and ethnicity are organizing features of society. Limited enrollment. Offered Spring. Instructor(s): Shelton.

**SOCI 310 URBAN SOCIOLOGY (3)**

Study of urban development, form, and heterogeneity; and the conditions of life associated with living in cities. Examines the rise of cities, their growth and purposes in the U.S. and internationally. Examines behavioral adaptations required by city life, and considers urban subcultures. Not offered this academic year.

**SOCI 311 THE SOCIOLOGY OF DEVIANT BEHAVIOR (3)**

This course examines the social construction of deviant behavior in American society. Through course readings, discussions, and empirical research projects, student will learn to critically analyze how certain behaviors come to be labeled "deviant" or "acceptable," and how these labels can shift historically, culturally, and politically. Offered Fall. Instructor(s): Schilt.

**SOCI 312 ECONOMIC SOCIOLOGY (3)**

Sociological perspectives on "the economy" emphasizes that (1) economies are not reducible to markets and that (2) markets are social structures. Accordingly, this course examines how economic processes, such as production, distribution and exchange, are embedded in interpersonal relationships and social institutions such as bureaucratic states, local communities and families. Offered Spring. Instructor(s): Britton.

**SOCI 313 DEMOGRAPHY (3)**

Introduction to the study of the dynamics of population change. Includes demographic data sources, components of population change, mortality patterns, family planning, the measurement of migration flows, and population-economic models. Limited enrollment. Not offered this academic year.

**SOCI 315 POPULATION AND SOCIETY (3)**

Population and Society examines social problems and social change from a population-based perspective. Topics include: basics of demographic measurement and demographic processes (e.g. mortality, fertility, and migration), population growth and social inequality, the changing ways U.S. Census counts population, population growth and changes in the American family. Pre-requisite(s): SOCI 101. Limited enrollment. Offered Spring. Instructor(s): Bratter.

**SOCI 321 CRIMINOLOGY (3)**

Study of criminal behavior. Includes social construction of crime, elementary forms of crime, empirical patterns of crime, and theories of crime. Field work required. Limited enrollment. Offered Fall.

**SOCI 325 SOCIOLOGY OF LAW (3)**

Introduction to Sociological theories of law. Examines central question in the field: Do the social characteristics of legal actors influence legal outcomes? Focuses on the role of race, sex, and social status. Field work required. Limited enrollment. Not offered this academic year.

**SOCI 329 MULTIRACIAL AMERICA (3)**

Multiracial America examines the phenomenon of race mixing (e.g. interracial interaction, multiracial identity) from a sociological perspective. The course covers the legal, political, and cultural contexts of interracial interaction and how these impact current understanding of what it means to be "mixed race." Recommended Prerequisite(s): SOCI 101 Limited enrollment. Offered Fall. Instructor(s): Bratter.

**SOCI 330 SOCIAL MOVEMENTS (3)**

Strategies by which citizens effect social change through non-institutionalized political activity. The emergence, maturation, and decay of protest movements. Political impact of social movements on both institutions and individuals. Primary focus is on 20th-century United States. Not offered this academic year.

**SOCI 331 THE CRIMINAL JUSTICE SYSTEM (3)**

Examination of the major components of the criminal justice system: 1) Police role and culture, contemporary approaches; 2) Courts (judges, prosecutors, defense attorneys, plea bargaining, juries, appeals, pre-sentence investigation, and sentencing); and 3) Corrections, with attention to responsibility and punishment, prisons, probation, parole, and alternatives. Limited enrollment. Not offered this academic year.

**SOCI 333 SOCIOLOGY OF RELIGION (3)**

Study of religious beliefs, symbols, actions, organizations, roles, and various interrelationships between religion and society. Includes new religious movements, secularization, and fundamentalism. Field work required. Limited enrollment. Not offered this academic year.

**SOCI 334 SOCIOLOGY OF THE FAMILY (3)**

This course will teach students the important influences and consequences of American family life. We will consider issues as dating, marriage and cohabitation, divorce, family structure, gay marriage, domestic violence, and household labor. We will also examine the role of society in shaping family norms and constraints on family behaviors. Cross-listed with SWGS 325. Limited enrollment. Offered Fall. Instructor(s): Heard.

**SOCI 335 POLITICAL SOCIOLOGY (3)**

Can democracy survive its enemies: tyranny of ruling elites and classes, tyranny of the majority, ethnic and religious conflict, individualism, government secrecy, citizen apathy? Limited enrollment. Not offered this academic year.

**SOCI 345 INTRODUCTION TO MEDICAL SOCIOLOGY (3)**

This course will explore the relationship between social factors and health, illness, and mortality. Topics include the stratification of health by race/ethnicity, gender, and social class; environmental context and illness; lifestyle and behavioral risks (smoking, drinking, drugs, and sexual behavior); STDs and cross-national comparisons of health and patterns of disease. Limited enrollment. Offered Fall. Instructor(s): Gorman.

**SOCI 355 SOCIOLOGY OF DRUGS AND ALCOHOL (3)**

This course will focus on the use of drugs in the United States, and will discuss issues relating to tobacco (e.g., regulation and marketing), alcohol (e.g., binge drinking), legal drugs (e.g., regulation, pricing, and marketing), and illicit drug use (e.g., The War on Drugs, legalization vs. prohibition debates, medical marijuana). Limited enrollment. Offered Spring. Instructor(s): Gorman.

**SOCI 360 SOCIOLOGY OF CULTURE (3)**

This course surveys the different sociological approaches to studying culture. Part I focuses on the relationships between culture and social structure, including various theoretical approaches. Part II examines different perspectives on modern culture. Limited enrollment. Not offered this academic year. Instructor(s): Long.

**SOCI 367 ENVIRONMENTAL SOCIOLOGY (3)**

Applications of research and theory in the social sciences to an understanding of the attitudes and behaviors that contribute both to environmental problems and to their remediation; examination of the interactions between population pressures and human appetites, technological developments and ecological constraints as they combine to shape the human prospect. Cross-listed with ENST 367. Limited enrollment. Not offered this academic year. Instructor(s): Klineberg.

**SOCI 375 THE SOCIAL DYNAMICS OF LEADERSHIP: ELITES AND SOCIETY (3)**

This course explores the rise, reign, and fall of leading groups in human societies (the powerful, the influential, the celebrated, the stars) with emphasis on the contemporary United States. Particular themes to be addressed include power, wealth, fame, and status as well as leadership failures, moral dilemmas, and issues of accountability. Cross-listed with LEAD 375. Limited enrollment. Offered Spring. Instructor(s): Lindsay.

**SOCI 386 AFRICAN AMERICANS IN SOCIETY (3)**

Contemporary life of Blacks (African-Americans) in society. The meaning and significance of race, prejudice and discrimination; social institutions such as the economy, education, and family; and potential strategies such as affirmative action and reparations. Limited enrollment. Offered Spring. Instructor(s): Heard.

**SOCI 403 INDEPENDENT STUDY (1 TO 6)**

Directed reading and written papers on subjects not regularly offered; advanced study of subjects on which courses are offered. Instructor permission required. Repeatable for Credit. Offered Fall.

**SOCI 404 INDEPENDENT STUDY (1 TO 4)**

Directed readings and essay writing on special subjects. Includes advanced study in subjects from other courses, if desired. Instructor permission required. Repeatable for Credit. Offered Spring.

**SOCI 405 ETHNOGRAPHIC RESEARCH (3)**

Beginning with the theoretical frameworks for ethnographic and other qualitative research methods, the course will cover ethics, entry, observation, field notes, interviewing, data analysis, and writing reports. It will offer a hands-on approach combining lectures, research through lectures, readings, and fieldwork. Field projects can be conducted in group, classroom, campus, or community settings. Limited enrollment. Offered Fall. Instructor(s): Smith.

**SOCI 415 NEW SOCIAL MOVEMENTS (3)**

Study of social movements that have emerged since the late 20th century, including environmentalism, the women's movement, and the movement for gay rights, peace, indigenous people's rights, and global justice. We will also consider conservative movements, such as fundamentalism, as responses to modernization. Seminar format: presentation, discussion, research paper. Pre-requisite(s): SOCI 203. Limited enrollment. Offered Spring. Instructor(s): Long.

**SOCI 436 RESEARCH SEMINAR: THE HOUSTON AREA SURVEY (4)**

Continuation of the series of annual surveys on how Houston residents are reacting to the ongoing economic and demographic changes. Includes sampling procedures, questionnaire construction, interviewing, data analysis, and the logic and skills of survey research. Culminates in a research report that develops empirical hypotheses and tests their validity with the survey findings. Limited enrollment. Not offered this academic year. Instructor(s): Klineberg.

**SOCI 440 FAMILY INEQUALITY (3)**

This is an intense, upper-level seminar focused on aspects of inequality concerning American families. We will discuss how well-known modes of inequality, such as race/ethnicity, gender, and social class, affect individual families, as well as how families serve as agents of inequality along these lines. Cross-listed with SWGS 444. Pre-requisite(s): SOCI 334. Limited enrollment. Not offered this academic year. Instructor(s): Heard.

**SOCI 449 IMMIGRATION AND PUBLIC HEALTH (3)**

This course explores the relationship between international migration and public health both historically and in the contemporary period. We will discuss the substantive and methodological complexities of the health-migration relationship and their implications for public policy debates world-wide. Limited enrollment. Not offered this academic year.

**SOCI 465 GENDER AND HEALTH (3)**

This course will examine the relationship between gender and health, both physical and mental. We will begin the semester by examining issues related to gender and health in the U.S. We will spend the second half of the semester examining gender and health in an international context. Cross-listed with SWGS 465. Instructor permission required. Not offered this academic year. Instructor(s): Gorman.

**SOCI 470 URBAN LIFE AND SYSTEMS (3)**

Study of urban development, its systems, and life experiences of urbanites. Uses readings and weekly time spent in assigned neighborhoods. Students will conduct urban ethnographies and analysis through a series of guided assignments. Limited enrollment. Offered Fall. Instructor(s): Emerson.

**SOCI 475 RELIGION AND PUBLIC LIFE: A SOCIOLOGICAL APPROACH (3)**

This seminar explores the expression of religious conviction in public, examining the connection between religion and areas like the economy, politics, professional life, the civil society. Preference will be given to seniors who are particularly interested in applying sociological analysis to the study of religion. Prerequisite(s): SOCI 101. Limited enrollment. Offered Fall. Instructor(s): Lindsay.

**SOCI 492 DIRECTED HONORS RESEARCH (3)**

Sociological research under faculty supervision. Includes first-semester review of relevant literature and the preparation of an outline for planned research, followed by second-semester research and the writing of an honors thesis. Open only to students in sociology honors program. Instructor permission required. Offered Spring.

**SOCI 493 DIRECTED HONORS RESEARCH (3)**

Sociological research under faculty supervision. Includes first-semester review of relevant literature and preparation of outline for planned research, followed by second-semester research and the writing of an honors thesis. Open only to students in sociology honors program. Instructor permission required. Offered Fall.

**SOSC (SOCIAL SCIENCES)****School of Social Sciences/Social Sciences Division****SOSC 100 AP HUMAN GEOGRAPHY (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**SOSC 102 INTELLECTUAL FOUNDATIONS OF THE SOCIAL SCIENCES (3)**

A survey of fundamental ideas, theories and approaches that have shaped the intellectual heritage of the social sciences. A foundation course. Not offered this academic year.



**SOSC 300 SOCIAL SCIENCE AND PUBLIC POLICY (3)**

Survey of how different disciplines in the social sciences treat public policy. Includes specific policy questions as a means of highlighting each discipline's approach to the study of public policy.

**SOSC 301 POLICY ANALYSIS (3)**

Familiarizes students with the analytical tools necessary for evaluating and analyzing public policies. Cross-listed with POLI 338. Repeatable for Credit.

**SOSC 305 CONTEMPORARY PALESTIAN ISSUES: TRANS TOWARDS NATION BUILDING (3)****SOSC 330 HEALTH CARE REFORM IN THE 50 STATES (3)**

Examination of those states that have undertaken comprehensive health system reform, have carried out more limited revisions, or have failed to even begin the process, assessing successes and failures. Includes general theories of state-federal relationships and the role of the federal government in state health reform.

**SOSC 398 PHARMACEUTICAL POLITICS AND POLICY (3)**

This course will introduce students to pharmacy policy, as essential aspect of public health. The approval of new medications, the differences between brand name drugs, generic, and over-the-counter drugs is considered along with the "shift movement," (prescription to OTC status). The development, distribution, marketing and consumption of pharmaceuticals are influenced by policy. All aspects of these processes are affected by the pharmaceutical industry, government (the FDA), Congress, insurance companies, pharmacists, hospitals, physicians, consumer representatives and patients. Regulatory issues, controlling the costs, state - federal relationships, cross-border purchases, and the global market for medication are discussed. Normative issues and ethical dilemmas will be discussed. Must be in one of the following Classification(s): Junior, Senior. Course taught at the School of Public Health medical Center one mile from Rice University campus; attendance required. Instructor(s): Rosenau.

**SOSC 400 POLICY STUDIES RESEARCH SEMINAR (1 TO 6)**

Advanced research in public policy. Students will complete a policy study or policy analysis in a substantive policy area. Repeatable for Credit.

**SOSC 420 HEALTH CARE: COMPETITION AND MANAGED CARE (3)**

Introduction to managed care and its distinguished characteristics. Includes managed care and market competition and impact on science in general and medical science in particular, as well as evaluation of how competition and regulation influence the development, assessment, and diffusion of new health technologies within the managed care framework.

**SOSC 430 THE SHAPING OF HEALTH POLICY (3)**

Study of how health-care policy decisions are made and implemented, using an interdisciplinary approach involving government, law, ethics, economics, and history. Includes case discussions of major policy problems by faculty experts in these disciplines and guest speakers who are leading national figures in the shaping of public policy. Class meets at an off-campus location. For information, call (713) 500-9491.

**SPAN (SPANISH)****School of Humanities/Center for Study of Languages****SPAN 101 INTRODUCTION TO SPANISH LANGUAGE AND CULTURE I (5)**

Based on a task-oriented approach to language and culture learning, Spanish 101 allows students to develop the abilities to communicate satisfactorily in Spanish in everyday situations. Students are expected to be active participants in this process. Class meetings are primarily based on student interaction. No prior knowledge of Spanish. Recommended prerequisite(s): Placement test. Limited enrollment. Offered Fall & Spring. URL: [lang.rice.edu/impresiones/](http://lang.rice.edu/impresiones/).

**SPAN 102 INTRODUCTION TO SPANISH LANGUAGE AND CULTURE II (5)**

Continuation of SPAN 101. Pre-requisite(s): SPAN 101, or placement test. Limited enrollment. Offered Fall & Spring. URL: [lang.rice.edu/impresiones/](http://lang.rice.edu/impresiones/).

**SPAN 150 LATIN AMERICAN SHORT FICTION (EMPHASIS ON BORGES AND CORTAZAR) (3)**

Freshman Seminar. Readings of classic works of short fiction by modern Latin American masters, with special emphasis on the stories of Jorge Luis Borges and Julio Cortazar. Close reading, interpretation and appreciation of stories (in English translation) will be the focus of class discussion, presentations and short interpretative essays. Taught in English. Open to first-year students only, except by permission of the instructor. Cross-listed with FSEM 150. Must be in one of the following Classification(s): Freshman. Limited enrollment. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 152 THE HISPANIC ESSAY (3)**

Freshman Seminar. Readings in English from modern Spanish and Latin-American essayists, including Miguel de Unamuno, Jose Marti, Jose Ortega y Gasset, Victoria Ocampo, Maria Zambrano, Alphonso Reyes, Jorge Luis Borges, Fernando Savater, Ariel Dorfman, Roger Bartra, et al. Close reading, discussion, short interpretive papers. Taught in English. Open to first-year students only, except by permission of the instructor. Cross-listed with FSEM 152. Must be in one of the following Classification(s): Freshman. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 153 DON QUIXOTE DE LA MANCHA (IN ENGLISH) (3)**

Freshman Seminar. The class will involve close reading and interpretation of Cervantes's immortal novel, "Don Quixote de la Mancha", voted "the best book of all time." Cross-listed with FSEM 153. Limited enrollment. Instructor(s): Castaneda.

**SPAN 201 INTERMEDIATE SPANISH LANGUAGE AND CULTURE I (4)**

Based on a communicative approach to learning language and culture, Spanish 201 allows the intermediate students to expand their vocabulary, develop language skills and improve proficiency. Students are expected to be active participants in the learning process. Class meetings are not based on lectures, but rely heavily on student interaction. Pre-requisite(s): SPAN 102, or placement test or permission of instructor. Limited enrollment. Offered Fall & Spring.

**SPAN 202 INTERMEDIATE SPANISH LANGUAGE AND CULTURE II (4)**

Continuation of SPAN 201 based on a communicative approach to language learning. Classes incorporate proficiency based instruction focused on expanding vocabulary and further developing the four communicative skills (reading, writing, speaking, and listening). Pre-requisite(s): SPAN 201, or placement test or permission of instructor. Limited enrollment. Offered Fall & Spring.

**SPAN 203 INTERMEDIATE SPANISH I FOR BI-CULTURAL STUDENTS (4)**

This course is intended for students who have been exposed to Spanish at home, through relatives and/or in the community and who wish to improve their confidence and fluency by expanding their formal knowledge of the language and of Hispanic cultures. Authentic materials such as short stories, poetry, films and articles will be used to develop reading, writing, speaking and listening skills. Previous formal instruction is welcomed but not required. Limited enrollment. Offered Fall.

**SPAN 204 INTERMEDIATE SPANISH FOR BI-CULTURAL STUDENTS (4)**

Continuation of SPAN 203. This course is for students who have been exposed to Spanish at home, through relatives and/or in the community and who wish to improve their confidence and fluency by expanding their formal knowledge of the language and of Hispanic cultures. Authentic materials such as short stories, poetry, films and articles will be used to develop reading, writing, speaking and listening skills. Pre-requisite(s): SPAN 203, or placement test or permission of instructor. Recommended prerequisite(s): Significant exposure to Spanish. Limited enrollment. Offered Spring.

**SPAN 222 AP CREDIT IN SPANISH LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**SPAN 223 AP CREDIT IN SPANISH LANGUAGE (4)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**SPAN 225 AP CREDIT IN INTERMEDIATE SPANISH (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**SPAN 226 AP CREDIT IN INTERMEDIATE SPANISH (3)**

This course provides credit for students who have successfully completed approved examinations, such as Advanced Placement exams, or for students with transfer credit. This credit counts toward the total credit hours required for graduation.

**SPAN 301 ADVANCED SPANISH I (3)**

This course aims to bring students from an intermediate towards an advanced level of proficiency in Spanish. Students will develop fluency and communicative competence through exposure to literary texts, newspaper and web articles, films and videos, in their cultural context. Emphasis will be on conversation strategies, vocabulary expansion and the writing of essays. Pre-requisite(s): SPAN 202, or placement test or permission of instructor. Limited enrollment.

**SPAN 302 ADVANCED SPANISH II (3)**

Continuation of SPAN 301. Pre-requisite(s): SPAN 301, or placement test or permission of instructor. Limited enrollment.

**SPAN 303 ADVANCED SPANISH FOR BI-CULTURAL STUDENTS (3)**  
SPAN 303 aims to bring students to advanced proficiency in Spanish, enabling them to interact confidently in a wide variety of contexts, while providing them with cultural insights about the Hispanic world. It is designed for students who come with bi-cultural exposure and at least intermediate proficiency in Spanish.

**SPAN 304 LANGUAGE AND CULTURE OF HISPANICS IN THE UNITED STATES (3)**

The aim of this course is to achieve advanced level of proficiency. The course will explore issues of the cultural identity of Spanish speakers by studying Hispanic culture in the U.S. Based on the study of Hispanic culture in the U.S. from three different viewpoints: historical, literary, and sociolinguistic. Prerequisite(s): SPAN 303, or placement test or permission of instructor. Limited enrollment.

**SPAN 305 COMMERCIAL SPANISH I (3)**

This course will familiarize students with the world of business in Spanish through activities dealing with current socio-economic events in Latin America and Spain, commercial correspondence, cross cultural awareness and presentations. Supranational organizations in the area will be topic of a final project for the class. Limited enrollment. Offered Fall. URL: [lang.rice.edu/janv/SPAN305/Mainpage.html](http://lang.rice.edu/janv/SPAN305/Mainpage.html).

**SPAN 306 COMMERCIAL SPANISH II (3)**

Further development of SPAN 305 goals: vocabulary, concepts, language and cultural skills necessary to communicate successfully in the socio-economic and cultural milieu of contemporary Hispanic countries. A practical case of marketing will be the final project for the class. SPAN 305 is not required for the class. Limited enrollment. Offered Spring. URL: [lang.rice.edu/janv/SPAN306/Mainpage.html](http://lang.rice.edu/janv/SPAN306/Mainpage.html).

**SPAN 307 THE LANGUAGE AND CULTURE OF MEDICINE AND HEALTH CARE (3)**

Students will study the body's major organ systems and learn terminology in Spanish in order to discuss these systems and the diseases that affect them. Students will also explore the differences between Anglo-American and Latin-American cultures of medicine and certain disease states. Limited enrollment.

**SPAN 308 THE LANGUAGE OF MEDICINE AND HEALTH CARE (4)**

Students will continue to study the body's major organ systems and apply their knowledge to the translation of patient education materials, case reports, and other clinical documents. Students enrolled in this course will be required to volunteer 40 clock-hours as clinical interpreters. Pre-requisite(s): SPAN 307, or placement test or permission of instructor. Limited enrollment.

**SPAN 309 SPANISH PRACTICAL PHONETICS (3)**

This course will help students improve their Spanish pronunciation. Students will learn about specific problems that English speakers have in learning to produce Spanish sounds, and the influence of English on the pronunciation of Spanish. We will discuss regional Spanish pronunciation found in different countries. Students will describe Spanish sounds and write phonetic transcriptions of spoken Spanish using the phonetic alphabet. Taught in Spanish. Pre-requisite(s): SPAN 202 or permission of instructor. Offered Spring. URL: [//lang.rice.edu/ppatters/309/Practical%20Phonetics.htm](http://lang.rice.edu/ppatters/309/Practical%20Phonetics.htm).

**SPAN 310 THE LANGUAGE OF MEDICINE AND HEALTHCARE PRACTICUM (1 TO 3)**

The number of credits is based on the number of internship hours. Instructor permission required. Repeatable for Credit.

**SPAN 313 SCIENTIFIC SPANISH I (3)**

Content-based course in Spanish in which the student will be familiarized with uses of the language necessary to deal with scientific issues in the Spanish-speaking world. Science background is not required since we mainly work with popular science topics. Limited enrollment. Offered Fall. URL: [lang.rice.edu/janv/SPAN313/Mainpage.html](http://lang.rice.edu/janv/SPAN313/Mainpage.html).

**SPAN 314 SCIENTIFIC SPANISH II (3)**

Continuation of SPAN 313. Content-based course in Spanish dealing with vocabulary and scientific issues in the Spanish-speaking world. Science background is not required since we mainly work with popular science topics. SPAN 313 is not a required pre-requisite for this class. Limited enrollment. Offered Spring. URL: [lang.rice.edu/janv/Spanish314/mainpage.html](http://lang.rice.edu/janv/Spanish314/mainpage.html).

**SPAN 315 THE ART AND MECHANICS OF TRANSLATION I (3)**

Working with various types of texts in English and Spanish, students will begin to acquire the theoretical, linguistic, and research tools to solve common translation problems. This course will improve Spanish proficiency, and broaden cross-cultural understanding. Pre-requisite(s): SPAN 302 or SPAN 303, or placement test or permission of instructor. Not offered this academic year.

**SPAN 340 SPANISH CULTURE AND CIVILIZATION (3)**

Topics relating to Spain's history and the development of social, political and economic institutions form the basis for extensive conversation, discussion, and composition. Recommended prerequisite(s): Third-year Spanish or permission of the instructor. Offered Fall. Instructor(s): Perez.

**SPAN 341 MASTER WORKS OF SPANISH ART AND LITERATURE (3)**

Selected masterpieces of Spanish art and literature; emphasis on specific aesthetic achievement of each work in its European and Spanish contexts, and on how the work reflects important cultural, social, and ideological issues of its times. Exemplary pairs (an author and an artist) from key historical moments will be studied. Recommended prerequisite(s): Third-year Spanish or permission of instructor; no prerequisite when course offered in English. Offered Spring. Instructor(s): Kauffmann.

**SPAN 342 WRITING WORKSHOP (3)**

Course designed to develop students' competence in written expression through close readings of poems, short stories, plays and newspaper articles. Students will learn the functions and strategies of different writing styles. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Offered Spring. Instructor(s): Perez.

**SPAN 345 MAPPING LATIN AMERICAN CULTURE (3)**

Explores key issues in Latin American culture. Important aspects of the contemporary situation in Latin America are also studied, including phenomena such as globalization, the rise of mega-cities, migration, authoritarianism, the impact of colonization and the rise of national states. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Offered Fall. Instructor(s): Rodriguez.

**SPAN 346 CONTEMPORARY MEXICO (3)**

Topics discussed include: the Mexican political system, the debate on national identity, border culture, urbanization, regionalism, and indigenous cultures. Uses a wide range of texts to introduce students to the richness and complexity of contemporary Mexican culture. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gaytan.

**SPAN 347 CONTEMPORARY MEXICO: STUDY TRIP (1)**

A one-week study trip to Zacatecas, Mexico intended as cultural immersion program. Course objectives are: perfecting effective communicative skills, learning about the institutions, culture and traditions of Mexico and doing research and field work in Spanish. Taught in conjunction with SPAN 346. Prerequisite(s): SPAN 346 or SPAN 311 or permission of instructor. Limited enrollment. Not offered this academic year. Instructor(s): Gaytan.

**SPAN 350 SOCIOLINGUISTICS OF SPANISH (3)**

Analysis of the modern varieties of Spanish covering phonetics, vocabulary, morpho-syntax, and pragmatics. The course requires the completion of a research project with an empirical database. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year.

**SPAN 365 SPAIN'S GOLDEN AGE (3)**

This course will deal with the history, politics, culture, art, and literature, which justify the use of the term Golden Age for the period of the Hapsburg Dynasty (1517-1700). Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 366 GOLDEN AGE DRAMA (3)**

Emphasis on the birth of the modern Spanish theater and the primary role played by Lope de Vega. Other dramatists to be studied are Guillen de Castro, Tirso de Molina, Mira de Amescua, and Ruiz de Alarcon. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 370 SURVEY OF SPANISH LITERATURE (3)**

A genre-based (poetry, narrative fiction, drama, essay) survey of the main movements in Spanish literature from medieval times to the present. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Perez.

**SPAN 372 FROM EL GRECO TO PICASSO: PAINTING IN SPAIN 1561-1974 (3)**

This course explores the extraordinary development of the art of painting in Spain from its emergence as a world power in the 16th century to its reintegration into the European community in the 20th century. The course will examine works by El Greco, Zurbaran, Velazquez, Ribera, Murillo, Goya, Picasso, Gris, Miro, Dali, Tapies among others. Taught in English. Limited enrollment. Not offered this academic year.

**SPAN 375 THE SPANISH CIVIL WAR (3)**

Prelude to World War II and culmination of perennial struggles between the so-called "two Spains," the Spanish Civil War (1936-39) is a watershed moment in modern Spanish and European history. Interdisciplinary, multi-media approach: the war seen through Spanish and foreign novels, poetry, film, painting, journalism, songs, and posters. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 376 POETRY AND CULTURE (3)**

Study of contemporary poetry and its cultural functions. Students engage with poetry through analysis and interpretation of selected Spanish poets. Students also practice writing and translating poems. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Offered Spring. Instructor(s): Perez.

**SPAN 377 THE SPANISH AVANT-GARDE (3)**

This cross-genre, multimedia course examines the contributions of major figures (Picasso, Gris, Dali, Diego, Alberti, Lorca, Bunuel, Gomez de la Serna) to the Spanish avant-garde in the 20th century. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Perez.

**SPAN 378 CURRENT ISSUES IN SPAIN (3)**

Exploration of diverse cultural aspects of today's Spain through films and newspaper articles. The topics discussed will serve as a springboard for further development of writing skills. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Perez.

**SPAN 379 LITERARY TRANSLATION (3)**

Overview of modern theories of literary translation, and practice in Spanish-English (and limited English-Spanish) literary translation, using examples from diverse genres of Spanish and Latin American literature. Recommended prerequisite(s): Third-year Spanish or equivalent. Offered Fall. Instructor(s): Kauffmann.

**SPAN 380 THE EVOLUTION OF SPANISH (3)**

This course provides an introduction to (1) major historical changes that led to the evolution of Proto-Romance (Vulgar Latin) to the Castilian dialect of Spanish (español or castellano), and (2) current developments and expected changes in the future of the various representatives of former Castilian dialect. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year.

**SPAN 381 THEORIES OF L2 DEVELOPMENT (3)**

This course surveys and critiques various theories of second language acquisition. Major topics are: analysis of linguistic, cognitive and social processes in the development of second languages, formal hypotheses of non-academic and classroom L2 learning, analysis of various SLA research methodologies and interpretation of findings from SLA research. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year.

**SPAN 382 THE ACQUISITION OF L2 SPANISH (3)**

This course reviews the available research on the acquisition of the phonology, vocabulary, morpho-syntactic and discursive-pragmatic features of Spanish as a second language. Aims to provide students with a thorough understanding of second language acquisition processes that are specific to Spanish but generalizable to other languages as well. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year.

**SPAN 385 FOUNDATIONS OF SPANISH AMERICAN LITERATURE (3)**

How did Spanish American literature acquire an identity of its own? This course attempts to answer this question by analyzing a number of foundational works of Spanish American literature in conjunction with later works that revise and rewrite key themes in the continent's literary tradition. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year.

**SPAN 386 CULTURE AND POWER IN LATIN AMERICA (3)**

This course uses a variety of materials and sources to examine the epistemologies of coloniality in Latin America, with a focus on their European and Western origins. Explores various aspects of the discourses of coloniality and subalternity in a range of cultural productions (cinema, poetry, narrative, salsa, Latin rock music). Recommended prerequisite(s): Third-year Spanish or permission of instructor. Offered Spring. Instructor(s): Gonzalez-Stephan.

**SPAN 387 HER SHORT STORY: CULTURE OF LATINO-AMERICAN WOMEN (3)**

This course will review the short narrative fiction of Latino-American women, in Spanish and English. Also their works in film, art and photography. Recommend third-year Spanish or permission of the instructor. Limited enrollment. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 388 THE LATIN AMERICAN SHORT STORY (3)**

Latin American writers have achieved great distinction in the genre of the short story. This course studies texts by some of the continent's best-known short-story writers, such as Cortazar, Borges, Monterroso, Rulfo, Fuentes, Garcia Marquez, Elena Garro, Ana Lydia Vega, Clarice Lispector, Benedetti, Uslar Pietri, Massiani, Lemebel, Asis, and Carpentier. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Offered Fall. Instructor(s): Lecuna.

**SPAN 389 LATIN AMERICAN TESTIMONIO (3)**

Explores a diverse range of literary and cultural forms in which minority or subaltern groups use autobiographical story-telling in order to express a communal identity. Examines how testimonial literature gives a voice to groups that have been silenced by the dominant culture. Recommended Prerequisite(s): Third-year Spanish or permission of the instructor. Offered Spring. Instructor(s): Lecuna.

**SPAN 390 HISPANIC CINEMA (3)**

This course examines the ways in which films in both Spain and Latin America have represented the cultural contexts of their countries. Focus is on the theme of power, and the consequences on social and individual lives. Cross-listed with SWGS 390. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 392 MEXICAN AVANT-GARDE NARRATIVE (3)**

This course looks at two key moments in the history of the Mexican avant-garde. We will begin by looking at the "historical" avant-garde of the 1920s and 30s, focusing on the estridentistas and on the Contemporaneous group, and reading works by Arqueles Vela, Xavier Icaza, Slavador Novo, Xavier Villaurrutia and Gilberto Owen. We will also study the emergence of a second avant-garde, represented by works such as "La semana de colores" by Elena Garro and "Aguila o sol?" by Octavio Paz. Recommended: Prerequisite(s): Third year Spanish or permission of instructor. Not offered this academic year.

**SPAN 393 CARIBBEAN FICTION (3)**

In spite of the region's political fragmentation and linguistic diversity, the Caribbean in many ways constitutes a unified literary region. This course examines differences and commonalities in the responses to the distinctive features of Caribbean history and geography in works by English-, Spanish-, French-, and Dutch-speaking authors. Authors studied include Alejo Carpentier, Reinaldo Arenas, Rosario Ferre, V.S. Naipaul, George Lamming, Jean Rhys, Cristina Garcia, Patrick Chamoiseau, and Frank Marinus Arion. Taught in English. Offered Fall. Instructor(s): Rodriguez.

**SPAN 394 TRANSNATIONAL CARIBBEAN CULTURES (3)**

Explores a wide range of Caribbean cultural products, including literature, cinema, music, visual arts, and historiography. Focuses on the hybrid and diasporic nature of Caribbean culture, tracing its roots in Europe, Africa and the indigenous past, as well as its recent migration to the United States. Recommended: Prerequisite(s)-Third-year Spanish or permission of the instructor. Offered Spring. Instructor(s): Rodriguez.

**SPAN 395 DIALOGUE OF THE AMERICAS (3)**

The history of Latin America since the nineteenth century has been profoundly shaped by its relationship to the "North" (the United States of America), as a model either to be imitated or rejected. This course examines both positions (emulation and detraction) as reflected in literature, painting, film, and political texts. Recommended prerequisite(s): Third-year Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 401 LITERARY THEORY/HISPANIC TEXTS (3)**

Overview of major schools in contemporary literary theory (e.g., Formalist, Structuralist, Post-structuralist, Marxist, Feminist, Neo-historicist), including Hispanic contributions to and adaptations of such theory where relevant, using texts from Spain and Latin America as study examples. Graduate/Undergraduate version: SPAN 501. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 405 LATIN AMERICAN LITERATURE IN THE MOVIES (3)**

This course analyzes the relation between literary texts and the movies, and establishes connections and adaptations of both. Graduate/Undergraduate version: SPAN 505. Advanced Spanish or permission of instructor. Limited enrollment. Offered Fall. Instructor(s): Gonzalez-Stephan.

**SPAN 410 THE PICARESQUE NOVEL (3)**

This course will deal with the relationships connecting the picaresque genre with the Libros de caballerias, the Novela pastoril, and "Don Quijote". Among the principal texts: "Lazarillo de Tormes", "Guzman de Alfarache", "El buscon", "Gil Blas de Santillana", and "Nuevas andanzas de Lazarillo". Graduate/Undergraduate version: SPAN 510. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 412 DON QUIJOTE (3)**

Cervantes's masterpiece is studied in its relationship to the books of knight errantry, and to the picaresque and pastoral novels, with emphasis on the innovative techniques of Cervantes, which contribute to the birth of the modern novel. Graduate/Undergraduate version: SPAN 512. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 414 CALDERON'S THEATER (3)**

This course will cover the principal dramatic works, which have earned for Calderon the distinction of being the most important philosophical and religious dramatist of the Golden Age. Among other dramatists to be studied are Moreto and Rojas Zorrilla. Graduate/Undergraduate version: SPAN 514. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 416 THE DON JUAN THEME (3)**

Studies the impressive trajectory of one of the world's most popular and intriguing legends. Works by Tirso de Molina, Moliere, Mozart, Lord Byron, George Bernard Shaw, and others. Several film versions of the Don Juan story will also be shown. Graduate/Undergraduate version: SPAN 516. Prerequisite (s): Advanced Spanish or permission of instructor. Offered Spring. Instructor(s): Castaneda.

**SPAN 420 THE DISPUTED GENERATION OF 1898 (3)**

The origins and fortunes of the Generation of 1898 as a historio-graphic concept. What have been the conceptual and historio-graphic gains and losses, and the main ideological functions of the concept of the Generacion del 98 since it was invented (separately, by Ortega y Gasset and Azorin, and with differing referents!) in 1913? Graduate/Undergraduate version: SPAN 520. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 422 UNAMUNO AND ORTEGA (3)**

Intellectual relations and mutual influences of two figures whose confrontation played a crucial role in defining the situation of Spain from 1900-1936. Reception of their thought by major writers of their time and ours (A. Machado, M. Zambrano, F. Ayala, J.L. Borges, O. Paz, L. Zea). Graduate/Undergraduate version: SPAN 522. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 428 CONTEMPORARY SPANISH LITERATURE (3)**

This course considers in detail specific problems, figures, movements, works, or literary genres. Examples: Torrente's trilogies; Poets of 1927; Social Conscience in Literature. Topics vary. Topic for Fall 2007: One hundred years of poetry. Graduate/Undergraduate version: SPAN 528. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Fall. Instructor(s): Perez.

**SPAN 430 20TH CENTURY SPANISH NOVEL (3)**

This course examines the evolution of the Spanish novel as a work of art while exploring how cultural issues are incorporated into fictional worlds. Graduate/Undergraduate version: SPAN 530. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Perez.

**SPAN 435 THE MODERN SPANISH ESSAY (3)**

Readings from representative essayists who attempt to define Spain's situation in response to the challenges of European modernity. Spanish "Europeanizers" vs. defenders of Spain's "differences" from Europe, scientific vs. anti-scientific rhetorical models, hierarchies of gender and genre, interpretations of Spanish landscape. Graduate/Undergraduate version: SPAN 535. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Fall. Instructor(s): Kauffmann.

**SPAN 440 BILINGUALISM (3)**

This course analyzes bilingualism from a variety of perspectives including cognitive, linguistic, and sociocultural viewpoints. Topics to be covered include conceptual representations of the lexicon, sentence parsing, levels of activation of bilingual modes, lexical, phonological, syntactic and pragmatic interference, code-switching, cultural identity, bilingual education, language and thought, etc. Cross-listed with LING 419. Graduate/Undergraduate version: SPAN 540. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 442 COGNITION AND L2 ACQUISITION (3)**

This course provides an in-depth analysis of general cognitive processes in second language development and cognitive based theories of second language acquisition. Some of the issues to be discussed in detail are perception, attention, memory, automaticity, restructuring, sentence processing, learnability theories, language and intelligence, critical periods for language acquisition, etc. Cross-listed with LING 420. Graduate/Undergraduate version: SPAN 542. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 444 TENSE AND ASPECT IN L2 ACQUISITION (3)**

This course provides an introduction to (1) the morpho-syntactic analysis of tense-aspect systems, (2) the development of inflectional morphology among first and second language learners, (3) the sequence and rate of development of aspectual contrasts, 4) the differences between natural and academic learning settings, and 5) the impact of pedagogical manipulations. Graduate/Undergraduate version: SPAN 544. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 446 ORIGIN AND EVOLUTION OF CASTILIAN SPANISH (3)**

The Romance languages come from the language spoken by the populace of Rome at the time of the Empire. This spoken language, known as "Vulgar Latin", began to be used in Spain around 197 A.D. The objective of this course is to analyze the development of the reconstructed form of spoken Latin into Hispano-Romance and into present-day Castilian. The importance of the Arabic contribution will be studied. Samples of literary texts will be discussed as linguistic documents. Graduate/Undergraduate version: SPAN 546. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 450 CIVILIZATION AND BARBARISM (3)**

Since the Conquest, Latin America has been viewed by the European imagination as an "empty" continent, lacking in culture and history. This image of a "savage" continent has been interiorized by Latin America's own intellectuals. This course examines and deconstructs various manifestations of these ideological representations of Latin America. Graduate/Undergraduate version: SPAN 550. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 452 (UN) DISCIPLINED BODIES (3)**

This course studies nineteenth-century and twentieth-century texts that contributed to nation-building in Latin America by developing images of the model citizen, in his/her manners, physical appearance, behavior, health, and ethnic identity. These texts also offer representations of those citizens regarded as undesirable. Graduate/Undergraduate version: SPAN 552. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 454 MACHO CULTURE IN LATIN AMERICA (3)**

This course examines the works of patriarchal ideology in a variety of cultural forms (literature, film, painting, photography). Studies the ways in which this ideology, which manifests itself in works by both men and women, defines male and female roles in Latin American culture. Graduate/Undergraduate version: SPAN 554. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 456 LATIN AMERICAN WOMEN'S CULTURE (3)**

Studies the cultural production (literary, artistic, cinematic) of intellectual women in Latin America. Examines the struggles for interpretive power in works by women from the colonial period to the present. Graduate/Undergraduate version: SPAN 556. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Spring. Instructor(s): Gonzalez-Stephan.

**SPAN 458 MEXICO AND THE UNITED STATES: LITERARY AND CULTURAL RELATIONS (3)**

Examines U.S. representations of Mexico and Mexican representations of the U.S.; parallels and differences between intellectual debates in the two nations, for example, around the question of nation building in a racially diverse society; cultural transformations taking place on the U.S.-Mexico border. Discussion of a wide range of sources, including novels, short stories, essays, journalism, travel literature, and film. Graduate/Undergraduate version: SPAN 558. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 460 EUROPE AND LATIN AMERICA (3)**

Definitions of Latin American literature and culture often take as their point of departure a consideration of the continent's relationship to Europe. This course examines works—essays, stories, and novels—that analyze and exemplify diverse aspects of this relationship. Graduate/Undergraduate version: SPAN 560. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Spring. Instructor(s): Rodriguez.

**SPAN 462 MODERN SPANISH AMERICAN NOVEL (3)**

Works by Asturias, Carpenter, Rulfo, Onetti, Vargas Llosa, Cortazar, Fuentes, and others. Examines how Spanish American novelists from the 1940s onward appropriated the techniques of European modernist literature and infused them with new cultural content. Graduate/Undergraduate version: SPAN 562. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Spring. Instructor(s): Lecuna

**SPAN 466 20TH CENTURY MEXICAN NARRATIVE (3)**

Examines the innovations in narrative form developed by twentieth-century Mexican novelists and short-story writers, as well as the social and political subjects with which they grappled in their work. Graduate/Undergraduate version: SPAN 566. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 468 OCTAVIO PAZ (3)**

Studies the literary and intellectual career of Nobel prize-winning Mexican poet and essayist Octavio Paz. Topics to be covered include: poetry and modernity; literature and national identity; art and the avant-garde; Paz's role in political debates in Mexico; the reception of his work at home and abroad. Graduate/Undergraduate version: SPAN 568. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 470 LATIN AMERICAN CULTURAL THEORY (3)**

This course analyzes the main theoretical positions within contemporary cultural criticism. We will also study the reflection of these theories in fiction and film. Graduate/Undergraduate version: SPAN 570. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Offered Fall. Instructor(s): Lecuna.

**SPAN 474 SPANISH AMERICAN POETRY AND THE EXPERIENCE OF THE LIMIT (3)**

Examines twentieth-century Spanish American poetry from the perspective of the poet's struggle to articulate experiences that exist at the limit of the inexpressible. Poets studied include Cesar Vallejo, Vicente Huidobro, Pablo Neruda, Jorge Luis Borges, Octavio Paz, Olga Orozco, Raul Zurita, Carmen Boullosa, Marosa di Giorgio and Francisco Hernandez. Graduate/Undergraduate version: SPAN 574. Recommended prerequisite(s): Advanced Spanish or permission of instructor. Not offered this academic year.

**SPAN 490 INDEPENDENT STUDY (1 TO 4)**

Research in Hispanic literature, Hispanic linguistics, Hispanic culture and civilization. Open to qualified juniors and seniors interested in a topic not covered in other courses. Recommended prerequisite(s): Advanced Spanish and permission of instructor. Offered Fall & Spring.

**SPAN 495 HONORS THESIS (3)**

Independent research projects by outstanding Spanish majors leading to a substantial honors essay, undertaken in close cooperation with a departmental faculty member, who must first approve the thesis proposal. Recommended prerequisite(s): Advanced Spanish and permission of instructor. Offered Fall & Spring.

**SPAN 501 LITERARY THEORY/HISPANIC TEXTS (3)**

Graduate version of SPAN 401. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 401. Not offered this academic year. Instructor(s): Kauffmann.



**SPAN 505 LATIN AMERICAN LITERATURE IN THE MOVIES (3)**

Graduate version of SPAN 405. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 405. Offered Fall. Instructor(s): Gonzalez-Stephan.

**SPAN 507 TEACHING COLLEGE SPANISH (PRACTICUM) (1 TO 3)**

Study of pedagogical principles applicable to the teaching of Spanish. Includes practice teaching and performance reviews, design of pedagogical activities and peer observation. Repeatable for Credit. Not offered this academic year.

**SPAN 510 THE PICARESQUE NOVEL (3)**

Graduate version of SPAN 410. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 410. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 512 DON QUIJOTE (3)**

Graduate version of SPAN 412. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 412. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 514 CALDERON'S THEATRE (3)**

Graduate version of SPAN 414. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 414. Not offered this academic year. Instructor(s): Castaneda.

**SPAN 516 THE DON JUAN THEME (3)**

Graduate version of SPAN 416. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 416. Offered Spring. Instructor(s): Castaneda.

**SPAN 520 THE DISPUTED GENERATION OF 1898 (3)**

Graduate version of SPAN 420. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 420. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 522 UNAMUNO AND ORTEGO (3)**

Graduate version of SPAN 422. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 422. Not offered this academic year. Instructor(s): Kauffmann.

**SPAN 528 CONTEMPORARY SPANISH LITERATURE (3)**

Graduate version of SPAN 428. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 428. Offered Fall. Instructor(s): Perez.

**SPAN 530 20TH-CENTURY SPANISH NOVEL (3)**

Graduate version of SPAN 430. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 430. Not offered this academic year. Instructor(s): Perez.

**SPAN 535 THE MODERN SPANISH ESSAY (3)**

Graduate version of SPAN 435. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 435. Offered Fall. Instructor(s): Kauffmann.

**SPAN 540 BILINGUALISM (3)**

Graduate version of SPAN 440. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 440. Not offered this academic year.

**SPAN 542 COGNITION AND L2 ACQUISITION (3)**

Graduate version of SPAN 442. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 442. Not offered this academic year.

**SPAN 544 TENSE AND ASPECT IN L2 ACQUISITION (3)**

Graduate version of SPAN 444. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 444. Not offered this academic year.

**SPAN 546 ORIGIN AND EVOLUTION OF CASTILIAN SPANISH (3)**

Graduate version of SPAN 446. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 446. Not offered this academic year.

**SPAN 550 CIVILIZATION AND BARBARISM (3)**

Graduate version of SPAN 450. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 450. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 552 (UN) DISCIPLINED BODIES (3)**

Graduate version of SPAN 452. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 452. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 554 MACHO CULTURE IN LATIN AMERICA (3)**

Graduate version of SPAN 454. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 454. Not offered this academic year. Instructor(s): Gonzalez-Stephan.

**SPAN 556 LATIN AMERICAN WOMEN'S CULTURE (3)**

Graduate version of SPAN 456. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 456. Repeatable for Credit. Offered Spring. Instructor(s): Gonzalez-Stephan.

**SPAN 558 MEXICO AND THE UNITED STATES: LITERARY AND CULTURAL RELATIONS (3)**

Graduate version of SPAN 458. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 458. Not offered this academic year.

**SPAN 560 EUROPE AND LATIN AMERICA (3)**

Graduate version of SPAN 460. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 460. Offered Spring. Instructor(s): Rodriguez.

**SPAN 562 MODERN SPANISH AMERICAN NOVEL (3)**

Graduate version of SPAN 462. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 462. Offered Spring. Instructor(s): Lecuna.

**SPAN 566 20TH CENTURY MEXICAN NARRATIVE (3)**

Graduate version of SPAN 466. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 466. Not offered this academic year.

**SPAN 568 OCTAVIO PAZ (3)**

Graduate version of SPAN 468. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 468. Not offered this academic year.

**SPAN 570 LATIN AMERICAN CULTURAL THEORY (3)**

Graduate version of SPAN 470. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 470. Offered Fall. Instructor(s): Lecuna.

**SPAN 574 SPANISH AMERICAN POETRY AND THE EXPERIENCE OF THE LIMIT (3)**

Graduate version of SPAN 474. Additional readings and assignments will be given to graduate students. Graduate/Undergraduate version: SPAN 474. Not offered this academic year.

**SPAN 591 FALL INDEPENDENT STUDY (1 TO 9)**

Research in Hispanic literature, Hispanic linguistics, and Hispanic culture and civilization. Open to graduate students interested in a topic not covered in other courses. Department permission required. Repeatable for Credit. Offered Fall.

**SPAN 592 SPRING INDEPENDENT STUDY (1 TO 9)**

Research in Hispanic literature, Hispanic linguistics and Hispanic culture and civilization. Open to graduate students interested in a topic not covered in other courses. Department permission required. Repeatable for Credit. Offered Spring.

**SPAN 700 SUMMER GRADUATE RESEARCH (1 TO 9)**

Research leading to candidacy. Repeatable for Credit. Offered Summer.

**SPAN 701 FALL RESEARCH LEADING TO CANDIDACY (1 TO 9)**

Topics in Spanish and Latin American literary theory and Spanish Linguistics. To be taken after a student has completed departmental course requirements for the Masters, and before being admitted to candidacy. Repeatable for Credit. Offered Fall.

**SPAN 702 SPRING RESEARCH LEADING TO CANDIDACY (1 TO 9)**

Topics in Spanish and Latin American Literary theory and Spanish Linguistics. To be taken after a student has completed departmental course requirements for the Master's degree, but before being admitted to candidacy. Repeatable for Credit. Offered Spring.

**SPAN 800 SUMMER THESIS RESEARCH (1 TO 9)**

Research and thesis. Taken after a student has been approved for candidacy. Can be repeated for credit. Repeatable for Credit. Offered Summer.

**SPAN 801 FALL RESEARCH AND THESIS (1 TO 9)**

Research for the M.A. thesis. Taken after approval for candidacy. Repeatable for Credit. Offered Fall.

**SPAN 802 SPRING RESEARCH AND THESIS (1 TO 9)**

Research for M.A. Thesis taken after approval for candidacy. Repeatable for Credit. Offered Spring.

## STAT (STATISTICS)

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### School of Engineering/Statistics

#### **STAT 100 DATA, MODELS, AND REALITY: AN INTRODUCTION TO THE SCIENTIFIC METHOD (3)**

The formation of models of reality and the ways models are tested by their analysis in the light of data are considered. We cover a variety of examples from antiquity to the present time. Offered Spring. URL: [www.ownet.rice.edu/~stat100](http://www.ownet.rice.edu/~stat100).

#### **STAT 280 ELEMENTARY APPLIED STATISTICS (4)**

Topics include basic probability, descriptive statistics, probability distributions, confidence intervals, significance testing, simple linear regression and correlation, association between categorized variables. Offered Fall & Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

#### **STAT 300 MODEL BUILDING (3)**

Examples to illustrate mathematical and statistical formulation (modeling) of scientific problems, their solution and interpretation. Problems from engineering, epidemiology, economics, and other areas are covered. Real-world situations are emphasized. Pre-requisite(s): MATH 211. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

#### **STAT 305 INTRODUCTION TO STATISTICS FOR BIOSCIENCES (4)**

An introduction to statistics for Biosciences with emphasis on statistical models and data analysis techniques. Computer-assisted data analysis, examples, is explored in laboratory sessions. Topics include descriptive statistics, correlation and regression, categorical data analysis, statistical inference through confidence intervals and significance testing, rates, and proportions, basic epidemiology. Real-world examples are emphasized; for example, genetics, dose-response, biological assays. Prerequisite(s): MATH 101 and MATH 102. Offered Fall. URL: [www.ownet.rice.edu/~stat305](http://www.ownet.rice.edu/~stat305).

#### **STAT 310 PROBABILITY AND STATISTICS (3)**

Probability theory and the central concepts and methods of statistics. Topics include probability distributions, expectation, estimation, hypothesis testing, sampling distributions, linear models. Cross-listed with ECON 382. Pre-requisite(s): MATH 102. Recommended prerequisite(s): MATH 212. Offered Fall & Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

#### **STAT 313 UNCERTAINTY AND RISK IN URBAN INFRASTRUCTURES (3)**

Practical applications and relevance of infrastructure risk are developed in the context of real engineering problems and phenomena, including unique systems and challenges of the gulf coast area. The course starts with a survey of the roles of probability in engineering and focuses on computer-based methods, the Bayesian approach, risk analysis tools, and infrastructure safety. Cross-listed with CEVE 313. Prerequisite(s): STAT 310. Repeatable for Credit. Limited enrollment. Instructor(s): Duenas-Osorio.

#### **STAT 331 APPLIED PROBABILITY (3)**

Elementary probability theory, conditional probability, independence, discrete and continuous random variables, expectation, standard discrete and continuous distributions, transformation techniques, central limit theorems, estimation, and correlation. Selected topics such as the Poisson process, Markov chains, and statistical techniques. Illustrations from engineering are emphasized. Cross-listed with ELEC 331. Pre-requisite(s): MATH 212. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

#### **STAT 385 METHODS OF DATA ANALYSIS AND SYSTEM OPTIMIZATION (4)**

The three general topic areas covered in this methodology oriented course are statistical methods including regression, sampling, and experimental design; simulation based methods in statistics, queuing and inventory problems; and an introduction to optimization methods. Excel will serve as the basic computing software. Pre-requisite(s): STAT 280 or STAT 305 or STAT 310. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

#### **STAT 400 ECONOMETRICS (3)**

See economics listing for course information. Cross-listed with ECON 400.

#### **STAT 405 STATISTICAL COMPUTING AND GRAPHICS (3)**

Programming techniques and tools useful and advanced statistical studies. Higher level graphical methods and exploratory data analysis.

#### **STAT 410 INTRODUCTION TO REGRESSION AND STATISTICAL COMPUTING (3)**

A survey of regression, linear models, and experimental design. Topics include simple and multiple linear regression, single- and multi-factor studies, analysis of variance, analysis of covariance, model selection, diagnostics. Data analysis using statistical software is emphasized. Pre-requisite(s): STAT 310 or STAT 331 or permission of instructor. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 411 ADVANCED STATISTICAL METHODS (3)**

Topics in sampling, experimental design, statistical process control and advanced regression. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 421 COMPUTATIONAL FINANCE II: TIME SERIES ANALYSIS (3)**

Applied time series modeling and forecasting, with applications to financial markets. UG/GR version: STAT 621. Graduate/Undergraduate version: STAT 621. Pre-requisite(s): STAT 310 or STAT 331. Recommended prerequisite(s): STAT 410. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 422 BAYESIAN DATA ANALYSIS (3)**

This course will cover Bayesian methods for analyzing data. The emphasis will be on applied data analysis rather than theoretical development. We will consider a variety of models, including linear regression, hierarchical models, and models for categorical data. Computational methods will be emphasized. Graduate/Undergraduate version: STAT 622. Pre-requisite(s): STAT 410. Offered Fall. URL: [www.owl.net.rice/~stat422](http://www.owl.net.rice/~stat422).

**STAT 423 PROBABILITY IN BIOINFORMATICS AND GENETICS (3)**

Course introduces the student to modern biotechnology and genomic data. Statistical methods to analyze genomic data are covered, including probability models, basic stochastic processes, and statistical modeling. Biological topics include DNA sequence analysis, phylogenetic inference, gene finding, and molecular evolution. UG/GR version: STAT 623. Graduate/Undergraduate version: STAT 623. Pre-requisite(s): STAT 305 or STAT 310 or STAT 331 or permission of instructor. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 431 OVERVIEW OF MATHEMATICAL STATISTICS (3)**

Topics include random variables, distributions, transformations, moment generating functions, common families of distributions, independence, sampling distributions, the basics of estimation theory, hypothesis testing and Bayesian inference. Pre-requisite(s): STAT 310 or STAT 331. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 450 PRACTICUM IN STATISTICAL MODELING (2)**

This course introduces current theoretical and applied problems encountered in statistical practice. The content changes each semester in response to contemporary topics. Graduate/Undergraduate version: STAT 540. Instructor permission required. Offered Spring.

**STAT 453 BIostatISTICS (3)**

An overview of statistical methodologies useful in the practice of Biostatistics. Topics include epidemiology, rates, and proportions, categorical data analysis, regression, and logistic regression, retrospective studies, case-control studies, survival analysis. Real biomedical applications serve as context for evaluating assumptions of statistical methods and models. S-Plus (R) serves as computing software. Graduate/Undergraduate version: STAT 553. Pre-requisite(s): STAT 410 or permission of instructor. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 470 FROM SEQUENCE TO STRUCTURE: AN INTRODUCTION TO COMPUTATIONAL BIOLOGY (4)**

Contemporary introduction to problems in computational biology spanning sequence to structure. The course has three modules: the first introduces students to the design and statistical analysis of gene expression studies; the second covers statistical machine learning techniques for understanding experimental data generated in computational biology; and the third introduces problems in the modeling of protein structure using computational methods from robotics. The course is project oriented with an emphasis on computation and problem-solving. Cross-listed with BIOE 470, COMP 470. Prerequisite(s): COMP 280 and COMP 212 and STAT 310 or STAT 331. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm). Instructor(s): Guerra; Kavradi; Kimmel; Subrmanian.

**STAT 485 QUANTITATIVE ENVIRONMENTAL DECISION MAKING (3)**

A project oriented computer intensive course focusing on statistical and mathematical solutions and investigations for the purpose of environmental decisions. This course is the undergraduate version of STAT 685 with reduced requirements. Graduate/Undergraduate version: STAT 685. Pre-requisite(s): STAT 305 and STAT 385 or permission of instructor. Corequisite(s): or permission of instructor. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm). Instructor(s): Raun.

**STAT 486 COMPUTATIONAL FINANCE I: MARKET MODELS (3)**

This course takes the classical efficient market models and superimposes upon it models for other stochastic phenomena not generally accounted for in efficient market theory, showing how risk is lessened by portfolios and other mechanisms. The course uses computer simulations as an alternative to closed form solutions. UG/GR version: STAT 686. Graduate/Undergraduate version: STAT 686. Prerequisite(s): STAT 310 or STAT 331. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 490 INDEPENDENT STUDY (1 TO 6)**

Repeatable for Credit. Offered Fall.

**STAT 491 INDEPENDENT STUDY (0 TO 6)**

Repeatable for Credit. Offered Spring.

**STAT 495 INTRODUCTION TO STATISTICS (3)**

See political science listing for course information. Cross-listed with POLI 495.

- STAT 499 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 3)**  
This course prepares a student for research in the mathematical sciences. Each section is dedicated to a different topic. Current topics include bioinformatics, biomathematics, computational finance, simulation driven optimization, and data simulation. Each semester may introduce new topics. Cross-listed with CAAM 499, MATH 499. Graduate/Undergraduate version: STAT 699. Repeatable for Credit. Offered Fall & Spring. URL: [www.vigre.rice.edu](http://www.vigre.rice.edu).
- STAT 503 TOPICS IN METHODS AND DATA ANALYSIS (3)**  
See political science listing for course information. Cross-listed with POLI 503.
- STAT 509 ADVANCED PSYCHOLOGICAL STATISTICS I (3)**  
See psychology listing for course information. Cross-listed with PSYC 502.
- STAT 510 ADVANCED PSYCHOLOGICAL STATISTICS II (3)**  
See psychology listing for course information. Cross-listed with PSYC 503.
- STAT 532 MATHEMATICAL STATISTICS I (3)**  
The first semester in a two-semester sequence in mathematical statistics: random variables, distributions, small and large sample theorems of hypothesis testing, point estimation, and confidence intervals; topics such as exponential families, univariate and multivariate linear models, and nonparametric inference will also be discussed. Required for graduate students in statistics. Prerequisite(s): STAT 581 and STAT 431 or permission of instructor. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 533 ADVANCED STATISTICAL INFERENCE (3)**  
A continuation of STAT 532. Required for Ph.D. students in statistics. Cross-listed with CAAM 533. Prerequisite(s): STAT 582 and STAT 532. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 540 PRACTICUM IN STATISTICAL MODELING (2)**  
This course introduces current theoretical and applied problems encountered in statistical practice. The content changes each semester in response to contemporary topics. Designed for graduate students in statistics. Graduate/Undergraduate version: STAT 450. Repeatable for Credit. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 541 MULTIVARIATE ANALYSIS (3)**  
Study of multivariate data analysis and theory. Topics include normal theory, principal components, factor analysis, discrimination, estimation and hypothesis testing, multivariate analysis of variance and regression clustering. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 542 SIMULATION (3)**  
Topics in stochastic simulation including; random number generators; Monte Carlo methods, resampling methods, Markov Chain Monte Carlo, importance sampling and simulation based estimation for stochastic processes. Prerequisite(s): STAT 532. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 545 GENERALIZED LINEAR MODELS AND CATEGORICAL ANALYSIS (3)**  
Contingency tables, association parameters, chi-squared tests, general theory of generalized linear models, logistics regression, loglinear models, poisson regression. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 546 DESIGN AND ANALYSIS OF EXPERIMENTS AND SAMPLING THEORY (3)**  
Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 547 SURVIVAL ANALYSIS (3)**  
Lifetime tables, cumulative distribution theory, censored data, Kaplan-Meier survival curves, log-rank tests, Cox proportional hazards models, parametric and non parametric estimation, hypothesis testing. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 550 NONPARAMETRIC FUNCTION ESTIMATION (3)**  
Survey of topics in data analysis including data visualization, multivariate density estimation, and nonparametric regression. Advanced applications will include clustering, discrimination, dimension reduction, and bump-hunting using nonparametric density procedures. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 551 ADVANCED TOPICS IN TIME SERIES (1 TO 3)**  
The course will cover current topics in both modeling and forecasting discrete and continuous time series. A brief coverage will also be given to spatial and spatial-temporal processes. Emphasis will be placed on applications in the area of computational finance. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 552 APPLIED STOCHASTIC PROCESSES (3)**  
This course covers the theory of some of the most frequently used stochastic processes in application; discrete and continuous time, Markov chains, Poisson and renewal processes, and Brownian motion. Pre-requisite(s): STAT 581 and STAT 582. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).
- STAT 553 BIostatISTICS (3)**  
Same as STAT 453 with advanced problem sets. Graduate/Undergraduate version: STAT 453. Prerequisite(s): STAT 410 or permission of instructor. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 581 MATHEMATICAL PROBABILITY I (3)**

Measure-theoretic foundations of probability. Open to qualified undergraduates. Cross-listed with CAAM 581. Offered Fall. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 582 MATHEMATICAL PROBABILITY II (3)**

Continuation of STAT 581. Pre-requisite(s): STAT 581. Offered Spring. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 583 INTRODUCTION TO RANDOM PROCESSES AND APPLICATIONS (3)**

See ELEC listing for course information. Cross-listed with CAAM 583, ELEC 533.

**STAT 586 WAVELET AND SPECTRAL ANALYSIS (3)**

See ELEC listing for course information. Cross-listed with ELEC 532.

**STAT 590 INDEPENDENT STUDY (1 TO 15)**

Repeatable for Credit. Offered Fall.

**STAT 591 INDEPENDENT STUDY (1 TO 6)**

Repeatable for Credit. Offered Spring.

**STAT 600 GRADUATE SEMINAR IN STATISTICS (2)**

Students participate in the process of researching professional literature (journal articles, book chapters, dissertations), preparing, delivering and critiquing talks. Literature topics change each semester. Must be enrolled in one of the following Major(s): Statistics. Must be enrolled in one of the following Level(s): Graduate. Repeatable for Credit. Offered Fall & Spring. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 604 ADVANCED ECONOMIC STATISTICS (5)**

See ECON listing for course information. Cross-listed with ECON 504.

**STAT 610 ECONOMETRICS I (5)**

Cross-listed with ECON 510.

**STAT 611 ECONOMETRICS II (5)**

Cross-listed with ECON 511.

**STAT 620 SPECIAL TOPICS (3)**

Seminar on advanced topics in Statistics. Repeatable for Credit. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 621 COMPUTATIONAL FINANCE II: TIME SERIES ANALYSIS (3)**

Applied time series modeling and forecasting, with applications to financial markets with advanced problem sets. UG/GR version: STAT 421. Graduate/Undergraduate version: STAT 421. Prerequisite(s): STAT 310 or STAT 331. Recommended prerequisite(s): STAT 410 Offered Spring. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 622 BAYESIAN DATA ANALYSIS (3)**

This course will cover Bayesian methods for analyzing data. The emphasis will be on applied data analysis rather than theoretical development. We will consider a variety of models, including linear regression, hierarchical models, and models for categorical data. Graduate/Undergraduate version: STAT 422. Pre-requisite(s): STAT 410. Offered Fall. URL: [www.owl.net/rice/~stat422](http://www.owl.net/rice/~stat422).

**STAT 623 PROB BIOFORMATICS & GENETICS (3)**

Course introduces the student to modern biotechnology and genomic data. Statistical methods to analyze genomic data are covered, including probability models, basic stochastic processes, and statistical modeling. Biological topics include DNA sequence analysis, phylogenetic inference, gene finding, and molecular evolution. UG/GR version: STAT 423. Graduate/Undergraduate version: STAT 423. Pre-requisite(s): STAT 305 or STAT 310 or STAT 331 or permission of instructor. Offered Spring.

**STAT 630 TOPICS IN CLINICAL TRIALS (3)**

This course deals with fundamental concepts in the design of clinical studies, ranging from early dose-finding studies (phase I) to screening studies (phase II) to randomized comparative studies (phase III). The goal is to prepare the student to read the clinical trial literature critically and to design clinical studies. Additionally, the faculty will introduce newer designs for clinical studies that incorporate prior knowledge and/or satisfy optimality considerations. Topics include protocol writing; randomization; sample size calculation; study design options; interim monitoring; adaptive designs; multiple end points; and writing up the results of a clinical trial for publication. Not offered this academic year. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 639 EXTREME VALUE THEORY (3)**

Extreme Value Theory is used in many areas such as financial markets, risk management, environmental studies, as well as network design. In this course, we will study the theory and practice of extreme value theory. Prerequisite(s): STAT 532. Recommended prerequisite(s): STAT 533. Not offered this academic year. URL: [statistics.rice.edu/courses/cfm](http://statistics.rice.edu/courses/cfm).

**STAT 640 DATA MINING AND STATISTICAL LEARNING (3)**

Survey of ideas, methods, and tools for analyzing large data sets; techniques for searching for unexpected relationships in data. Topics from supervised and unsupervised learning include regression, discriminant analysis, kernels, model selection, bootstrapping, trees, MARS, boosting, classification, clustering, neural networks, SVM, association rules, principal curves, multidimensional scaling, and projection pursuit. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 647 ADVANCED SURVIVAL ANALYSIS (3)**

Pre-requisite(s): STAT 547. Not offered this academic year. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 650 STOCHASTIC DIFFERENTIAL EQUATIONS (3)**

This course will cover both theory and applications of stochastic differential equations. Topics include: the Langevin equation from physics, the Wiener process, white noise, the martingale theory, numerical methods and simulation, the Ito and Stratonovich theories, applications in finance, signal processing, materials science, biology, and other fields. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 670 STATISTICAL GENETICS (3)**

This course centers on applications of statistics in genetic problems, especially as they pertain to genotype-phenotype association. Various data structures will be the centerpiece of the course, including genotype, allele-sharing, and gene-expression. Topics include family and population-based study design, linkage, association, differential gene expression. Genetic analysis software will also be discussed and used. \*The course will meet at M D Anderson Cancer Prevention Building, CPB4.3650. \* URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 675 GENE EXPRESSION AND PROTEOMICS (3)**

We propose to discuss development & application of statistical methods in the analysis of high throughput bioinformatics data that arise from problems in medical research, in particular cancer research, molecular and structural biology. We present a broad overview of statistical inference problems related to three main high-throughput platforms: microarray gene expression, serial analysis gene expression (SAGE), and mass spectrometry proteomic profiles. Our main focus is on the design, statistical inference and data analysis, from a statistician's perspective, of data sets arising from such high throughput experiments.

**STAT 685 QUANTITATIVE ENVIRONMENTAL DECISION MAKING (3)**

A project oriented computer intensive course focusing on statistical and mathematical solutions and investigations for the purpose of environmental decisions. This course is required for EADM students. Graduate/Undergraduate version: STAT 485. Offered Spring. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm). Instructor(s): Raun.

**STAT 686 COMPUTATIONAL FINANCE I: MARKET MODELS (3)**

This course takes the classical efficient market models and superimposes upon it models for other stochastic phenomena not generally accounted for in efficient market theory, showing how risk is lessened by portfolios and other mechanisms. The course uses computer simulations as an alternative to closed form solutions with advanced problem sets. UG/GR version: STAT 486. Graduate/Undergraduate version: STAT 486. Pre-requisite(s): STAT 310 or STAT 331. Offered Fall. URL: [statistics.rice.edu/courses.cfm](http://statistics.rice.edu/courses.cfm).

**STAT 688 DECISION THEORY WITH MEDICAL APPLICATION (3)**

Statistical inference, decision theory, and simulation as applied to assist in making individual clinical decisions, policy recommendations, and as a guide to study design and research; topics include statistical decision theory, decision analysis, decision trees, Markov models and simulation, cost-effectiveness analysis, meta-analysis, and sensitivity analysis. Grading will be based on regularly assigned homework exercises and term projects. Pre-requisite(s): STAT 422 and STAT 410 or permission of instructor. Not offered this academic year.

**STAT 699 MATHEMATICAL SCIENCES VIGRE SEMINAR (1 TO 3)**

This course prepares a student for research in the mathematical sciences on a specific topic. Each section is dedicated to a different topic. Current topics include bioinformatics, biomathematics, computational finance, simulation driven optimization, and data simulation. The topics change each semester. Cross-listed with CAAM 699, MATH 699. Graduate/Undergraduate version: STAT 499. Repeatable for Credit. Offered Fall & Spring. URL: [www.vigre.rice.edu](http://www.vigre.rice.edu).

**STAT 800 THESIS (1 TO 15)**

Repeatable for Credit. Offered Fall & Spring.

**SWGS (WOMEN, GENDER, & SEXUALITY)****School of Humanities/Study of Women, Gender, & Sexuality****SWGS 101 INTRODUCTION TO WOMEN & GENDER (3)**

Introduction to the Study of Women, Gender, and Sexuality. An introductory survey of issues in the study of women, including women's social, political, and legal status in the United States and around the world; feminist perspectives on sexuality, gender, family, and reproduction; and the implications of these perspectives for social and critical theory.

**SWGS 130 WOMEN AND NATIONAL SOCIALISM (3)**

Freshman Seminar: Introduction to the Nazi idea of "womanhood" and the actual roles women played during National Socialism. female perpetrators, Mitlauber, a multiplicity of victims, and to resistance fighters. The course is taught in English. Cross-listed with FSEM 130, GERM 130. Limited enrollment. Offered Fall. Instructor(s): Kecht.

**SWGS 201 INTRODUCTION TO LESBIAN, GAY, BISEXUAL, AND TRANSGENDER STUDIES (3)**

Introduction to Lesbian, Gay, Bisexual, and Transgender Studies. This course is an introduction to the interdisciplinary examination of sexual desires, sexual orientations, and the concept of sexuality generally, with a particular focus on the construction of lesbian, gay, bisexual, and transgender identities. The course will look specifically at how these identities interact with other human phenomena such as government, family, popular culture, scientific inquiry, and especially gender. In exploring sexual diversity, we will highlight the complexity and variability of sexualities both across different historical periods, and in relation to identities of race, class, ethnicity, and nation.

**SWGS 205 LANGUAGE AND SOCIETY (3)**

This course treats language as a social phenomenon to show how language, personal identity and institutions of social control inter-relate. The course focuses on linguistic interaction in daily life and how gender, ethnic, class, activity, and geographic variation affect language use. Cross-listed with LING 205. Instructor(s): Taylor.

**SWGS 225 WOMEN IN GREECE AND ROME (3)**

Survey of the depiction of women in Greek and Roman mythology, literature, and art. Includes a study of the lives of Greek and Roman women as evidenced by archaeological as well as literary materials. Cross-listed with CLAS 225. URL: [classicallegacy.rice.edu](http://classicallegacy.rice.edu). Instructor(s): Widzisz.

**SWGS 234 U.S. WOMEN'S HISTORY: COLONIAL BEGINNINGS TO THE CIVIL WAR (3)**

Survey of American women's history examines the lives of elite, working, black, Indian and white women, and traces changes in women's legal, political, and economic status from the mid-17th century through the Civil War. Topics include slavery, suffrage, sexuality, and feminism. Cross-listed with HIST 241. Instructor(s): Sneider.

**SWGS 235 U.S. WOMEN'S HISTORY II: CIVIL WAR TO THE PRESENT (3)**

Survey of American women's history examines the lives of black, Asian American, Chicana, Native American, and white women, and traces changes in women's legal, political, and economic status from the Civil War to the present. Topics include suffrage, anti-lynching, welfare, birth control, and the modern civil rights and feminist movements. Cross-listed with HIST 242. Instructor(s): Sneider.

**SWGS 240 GENDER AND POLITICIZED RELIGION (3)**

This course examines the emergence of religion-based politics in various Asian countries - particularly Hindu and Muslim - focusing on the women participants in these movements as well as the movements' concern with gender roles in society. We will investigate, for instance, the extent to which women participants have been willing or able to reshape the central ideas of such movements. Cross-listed with ASIA 240. Course equivalency: SWGS 340. Instructor(s): Shehabuddin.

**SWGS 250 INTERNATIONAL POLITICAL ECONOMY OF GENDER (3)**

This course explores the relationship between women's lives, gender ideologies, and international and domestic politics and economics. We will examine women's experiences with and resistance to the sexual division of labor, imperialism, capitalism, consumerism, domestic service, war, slavery, and migration across different geographical and historical contexts. Cross-listed with POLI 250. Instructor(s): Shehabuddin.

**SWGS 269 MURDER AND UNBELONGING IN THE LITERARY IMAGINATION (3)**

A comparative introduction to literatures from a variety of national traditions focused on a single theme. Past topics have included "Murder and Unbelonging." Cross-listed with ENGL 269.

**SWGS 275 FEMINIST SOCIAL THOUGHT (3)**

Study of feminist theory as critique and reconstruction. Includes Wollstonecraft and de Beauvoir, as well as contemporary debates about equity, difference, knowledge, sexuality, and power. Cross-listed with SOCI 275. Instructor(s): Long.

**SWGS 283 WOMEN IN THE MODERN ISLAMIC WORLD (3)**

Course introduces students to the history of women in the Islamic world. Topics include women and law, family relations, work, women as political actors in Islamic history, the harem as a social and political institution, women as property owners, veiling, and modern feminist movements throughout the Islamic world. Cross-listed with HIST 283. Instructor(s): Sanders.

**SWGS 300 MEDIEVAL WOMEN WRITERS (3)**

This course will examine the most significant medieval European women authors from the tenth through the seventeenth centuries. We will combine close reading with a focus on intertextuality to recover a feminized literary tradition. Cross-listed with ENGL 311, MDST 300. URL: [www.ruf.rice.edu/~jchance/mewom.htm](http://www.ruf.rice.edu/~jchance/mewom.htm). Instructor(s): Chance.



**SWGS 301 ARTHURIAN LITERATURE (3)**

A survey of the origins and development of the Arthurian legend from the earliest chronicles in the sixth century and later medieval French, Welsh, Irish, and English Arthurian poems to modern adaptations of Arthurian material, including films. URL: [www.rice.edu/~jchance/arthurian.pdf](http://www.rice.edu/~jchance/arthurian.pdf). Instructor(s): Chance.

**SWGS 305 CHAUCER (3)**

A course on Chaucer and his literary and philosophical backgrounds. Readings include minor poems, a dream vision, *The Canterbury Tales*, *Troilus and Criseyde*. Cross-listed with ENGL 316, MDST 316. URL: [www.rice.edu/~jchance/chaucer3/html](http://www.rice.edu/~jchance/chaucer3/html). Instructor(s): Chance.

**SWGS 306 HUMAN SEXUALITY (3)**

This course is designed to explore the physiological, psychological, and sociological parameters of human sexuality, while providing accurate information and helping students develop healthy attitudes toward sexuality. Cross-listed with HEAL 306.

**SWGS 315 GENDER AND ISLAM (3)**

Explores the lives of Muslim women in Asia, the Middle East, Europe, and North America; analyzes constructions of gender in the Islamic world overtime; the challenges faced from such diverse quarters as colonial administrators, Western feminists, and states; as well as movements and individuals within the Muslim world. Cross-listed with RELI 315. Limited enrollment. Instructor(s): Shehabuddin.

**SWGS 323 THE KNOWING BODY: BUDDHISM, GENDER AND THE SOCIAL WORLD (3)**

Western thought tends to regard mind and body dualistically, a view with significant impact on religious, cultural, gender and social processes. This course juxtaposes received Western assumptions with Buddhist perspectives (especially Tibetan Buddhist), mapping Western and Buddhist categories onto each other to better understand the implications of each. Cross-listed with ASIA 323, RELI 323. Graduate/Undergraduate version: SWGS 577. Instructor(s): Klein.

**SWGS 324 SOCIOLOGY OF GENDER (3)**

Relationship between gender and social role. Development of the contemporary sexual division of labor and process of socialization with reference to family, education, media, and occupations. Cross-listed with SOCI 306. Limited enrollment. Instructor(s): Long.

**SWGS 325 SOCIOLOGY OF THE FAMILY (3)**

This course will teach students the important influences and consequences of American family life. We will consider issues such as dating, marriage and cohabitation, divorce, family structure, gay marriage, domestic violence, and household labor. We will examine the role of society in shaping family norms and constraints on family behaviors. Cross-listed with SOCI 334. Limited enrollment. Instructor(s): Heard.

**SWGS 327 TWENTIETH CENTURY WOMEN WRITERS: AFRICAN WOMEN AND DIASPORA (3)**

A variable topics course that focuses on women from various traditions. Writers might come from Great Britain, the U.S. or elsewhere in translation. Topics have included "Sex, Gender, and Modernism," race and ethnicity, and African Writers of the Diaspora. Cross-listed with ENGL 381. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**SWGS 329 LITERATURE AND CULTURE OF THE AMERICAN WEST (3)**

An examination of the American literary West through the historical context of the U.S. in the 20th century, especially in light of postmodernity, the civil rights movement, Hollywood, and global politics. Cross-listed with ENGL 369. Instructor(s): Comer.

**SWGS 330 COURTSHIP, LOVE, AND MARRIAGE IN THE AGE OF CHIVALRY (3)**

Mapping German Culture: The literature of the High Middle Ages is the first since antiquity to probe the hazards and potentials of romance between men and women, as well as single-sex friendship and love. This course will show how the literary ideal of love emerged in a society that was torn apart by war and rivalry. The poems and stories we will read belong to the treasures of medieval literature from German lands. Taught in English with a possible FLAC section. Cross-listed with GERM 330, HUMA 330, MDST 335. Limited enrollment. Instructor(s): Westphal-Wihl.

**SWGS 331 PSYCHOLOGY OF GENDER (3)**

Overview of research and theory on gender in psychology. Cross-listed with PSYC 331. Instructor(s): Hebl.

**SWGS 332 SEX, SELF, AND SOCIETY IN ANCIENT GREECE (3)**

An introductory venture into conducting fieldwork in the past. The course treats a wide range of artifacts, from philosophical essays to vase paintings. It derives its focus from a rich corpus of recent research into the ancient problemization of desire and self-control. Cross-listed with ANTH 325. Instructor(s): Fabouin.

**SWGS 333 MASCULINITIES (3)**

This course deals with masculinities in the West, concentrating on concepts of masculine protagonism and personhood. Readings explore identities constructed in realms such as law, politics, finances, art, the home, and war. Cross-listed with ANTH 311.

**SWGS 335 THE LIFE CYCLE: A BIOCULTURAL VIEW (3)**

The human life cycle from conception to death. Focus is on the interaction between biological processes and culture. Cross-listed with ANTH 388. Instructor(s): Georges.

**SWGS 336 HISTORY AS A CULTURAL MYTH (3)**

Explores ideas of history and attitudes toward the past as culturally conditioned phenomena. Emphasizes history as a statement of cultural values as well as conceptualizations of cause, change, time, and reality. Cross-listed with ANTH 308.

**SWGS 339 FEMINIST PHILOSOPHY (3)**

This course is an introduction to feminist philosophy, including texts by both historical and contemporary thinkers (e.g. Wollstonecraft, Mill, de Beauvoir, MacKinnon, Gilligan, Irigaray). We shall discuss both feminists' radical critiques of traditional values and beliefs, and feminist alternative views of justice, ethical judgment, and truth. Cross-listed with PHIL 319.

**SWGS 340 GENDER AND POLITICIZED RELIGION (ENRICHED VERSION) (3)**

This course examines the emergence of religion-based politics in various Asian countries -particularly Hindu and Muslim -focusing on the women participants in these movements as well as the movements' concern with gender roles in society. We will investigate, for instance, the extent to which women participants have been willing or able to reshape the central ideas of such movements. Cross-listed with ASIA 340. Course equivalency: SWGS 240. Instructor(s): Shehabuddin.

**SWGS 342 GENDER, RACE AND TECHNOSCIENCE (3)**

This upper-level discussion-style seminar explores the influences of science, medicine, and technology to the conceptual formations and lived experiences of race, sex, and gender. Readings will be interdisciplinary with a heavy focus on historical and feminist science, medicine, and technology studies. Each participant will make one presentation and lead one discussion. Cross-listed with PHIL 342. Instructor(s): Koay.

**SWGS 343 WOMEN AND PERFORMANCE IN MODERN GERMAN LITERATURE AND CULTURE (3)**

Through close readings of a wide variety of literary texts as well as film and visual media, this course examines images of femininity in German literature and culture since the Enlightenment, while reassessing the significance of women as performers, writers and spectators. This course will be taught in English. Cross-listed with GERM 323. Offered Spring. Instructor(s): Dupree.

**SWGS 348 SUBJECTIVITY IN MODERN AND POSTMODERN ART AND THOUGHT (3)**

This course examines the intellectual history of subjectivity and its various representations in modernist and postmodernist aesthetics. In particular, we will consider the intersection of subjectivity and desire by examining the ongoing project of human self-creation through aesthetics, ornament, framing devices, technological apparatuses, and other supplementary objects of desire. Cross-listed with HART 368. Limited enrollment. Instructor(s): Brennan.

**SWGS 349 WOMEN WRITERS: 1400-1900 (3)**

A survey of major British early women writers. Poems, memoirs, plays, and novels by significant women, and their film adaptations. Cross-listed with ENGL 329. URL: [www.ruf.rice.edu/~jchance/womnsurvey3.htm](http://www.ruf.rice.edu/~jchance/womnsurvey3.htm). Instructor(s): Chance.

**SWGS 350 GENDER AND SYMBOLISM (3)**

Examinations of beliefs concerning men, women, and gender in different cultures, including the West, relating to issues of symbolism, power, and the distribution of cultural models. Cross-listed with ANTH 327.

**SWGS 351 COMING OF AGE IN THE TRANSNATIONAL WORLD (3)**

In this class, we study coming-of-age narratives conveyed in novels, films, testimonies and ethnographies. We understand the transnational as including the west, the postcolonial and the post-socialist space, as the movements of people, culture, and capital between these spaces. Assignments include presentation, a written coming-of-age narrative, and a critical paper. Offered Fall. Instructor(s): Nachescu.

**SWGS 354 SURVEY OF CHICANO/A LITERATURE (3)**

A mixed-genre course focusing on the Chicano movement, the Chicano renaissance, and alternative literary and mythic traditions associated with them. Cross-listed with ENGL 371.

**SWGS 358 EUROPEAN WOMEN FILMMAKERS (3)**

Mapping German Culture: Filmmaking has celebrated its first hundred years. Women's contributions were significant and deserve to widen the film canon for all filmgoers. The course will concentrate on films by European women directors, taking into account aesthetic particularities, gender commitment, and post-feminist attempts. Taught in English. Cross-listed with GERM 321, HART 385, HUMA 321.

**SWGS 361 NEW GERMAN CINEMA (3)**

Mapping German Culture: From the 1960's to 2000 Germany has developed a very distinct auteur cinema with independent filmmakers such as Fassbinder, Herzog, Wender, Trotta Sander, Brueckner, Doerrie, Garnier, Tykwer and others. The first 20 years of German film were oriented on coming to terms with the fascist past, the second 20 years focused on more contemporary issues. Film, critical reading, and class discussions in English. All films are subtitled in English and will be assessed with podium technology. Cross-listed with GERM 338, HUMA 373. Limited enrollment.

**SWGS 365 GENDER, SUBJECTIVITY, AND THE HISTORY OF PHOTOGRAPHY (3)**

This course will examine a range of subjects within the history, theory, and criticism of photography, including the relationship between commodification, eroticism, and the objectification of the body, and the intersecting issues of mechanical reproduction, authorship, and authenticity in modern and postmodern discourses. Cross-listed with HART 365. Limited enrollment. Instructor(s): Brennan.

**SWGS 366 TOPICS IN AMERICAN LITERATURE (3)**

Topics vary from year to year. Cross-listed with ENGL 366.

**SWGS 368 MYTHOLOGIES (3)**

An interdisciplinary course introduces students to a world of mythologies, mythmakers and their cultures from the beginnings to the modern period. Included mythologies: Babylonian, Sumerian, Hindu, Egyptian, Greek, Roman, Irish, Old Norse, Anglo-Saxon, Finnish, Mayan, Hopi, and modern (Glass Borges, Whale Rider). Cross-listed with ENGL 309, MDST 368. URL: [www.ruf.rice.edu/~jchance/myth.htm](http://www.ruf.rice.edu/~jchance/myth.htm). Instructor(s): Chance.

**SWGS 369 SEMINAR ON BEAUTY AND FRAGMENTATION IN MODERN ART (3)**

This course will examine literal and symbolic representation of the human body in modern American and European art. Topics addressed will include conceptions on beauty vs. subjective fragmentation; the performative nature of social identity; and art history's long-standing preoccupation with the sensuous equivalency of flesh and paint. Cross-listed with HART 369. Limited enrollment. Instructor(s): Brennan.

**SWGS 370 SURVEY OF AFRICAN AMERICAN LITERATURE (3)**

A course that traces, through various genres and themes, African American literary history from the late eighteenth century to the present. Attention is given to theories and critiques of African American literature and culture. Cross-listed with ENGL 370. Instructor(s): Fultz.

**SWGS 372 SURVEY OF VICTORIAN FICTION (3)**

A survey of the many genres of the 19th-century novel, this course will try to come to terms with some of the insistent questions posed by and through the fiction of the period. Cross-listed with ENGL 342.

**SWGS 387 CULTURAL STUDIES (3)**

Recent topics have included film, mass culture, "Marx", contemporary ethnic studies, and "the culture of love". Not limited in period, scope, or geography. Cultural Studies is a broad category. Repeatable for Credit.

**SWGS 389 GENERATION X IN LITERATURE AND CULTURE (3)**

An interdisciplinary survey of Generation X in literature, music, film, and politics. Cross-listed with ENGL 389. Instructor(s): Comer.

**SWGS 390 HISPANIC CINEMA (3)**

This course examines the ways in which films in both Spain and Latin America have represented the cultural contexts of their countries. Focus is on the theme of power, and the consequences on social and individual lives. Cross-listed with SPAN 390. Recommended prerequisite(s): Third year Spanish. Instructor(s): Gonzalez-Stephan.

**SWGS 391 PRODUCING FEMINIST KNOWLEDGE: METHODOLOGY AND VISUAL CULTURE (3)**

In this course, we will examine various methodologies used by feminist scholars in the Social Sciences and the Humanities. Particular attention will be devoted to the practical application of feminist methodologies in visual culture and the history of art, as well as to the interdisciplinary feminist inquiries in science, ethnography, and epistemology. Cross-listed with HART 391. Limited enrollment. Instructor(s): Brennan; Shehabuddin.

**SWGS 395 FEMINIST KNOWLEDGES (3)**

In this course, we will examine various methodologies used by feminist scholars in the social sciences and the humanities. Particular attention will be devoted to interdisciplinary feminist inquiries in science, ethnography, and epistemology. Instructor(s): Shehabuddin.

**SWGS 398 CONSTITUTIONAL HISTORY OF DISCRIMINATION: RACE, GENDER & SEXUAL ORIENTATION (3)**

Course on selected topics in legal history. Contents vary. Cross-listed with HIST 398. Limited enrollment.

**SWGS 399 WOMEN IN CHINESE LITERATURE (3)**

This course examines women's roles in Chinese literature as writers, readers, and characters, focusing particularly on the tension between women's lived bodily experiences and the cultural experiences inscribed on the female body and how, in the process, women have contrarily gendered patriarchal culture into their own. It will also touch on Chinese women's incorporation of the Western Tradition. Cross-listed with ASIA 399, MDST 379. Instructor(s): Qian.

**SWGS 400 CONSTRUCTING IDENTITIES IN MODERN FICTION (3)**

This course will explore the construction of racial, sexual, gendered, and ethnic identities in modern fiction, with a particular concern for the connections among identity, literary form, and social categories of meaning. Readings include Woolf, Colette, Duras, Djébar, Morisson, Winterson, Baraoui, and others.

**SWGS 403 WOMEN'S STORIES AND LEGAL CHANGE (3)**

This course will consider how narratives move us toward individual responsibility and social action. We will examine this question with reference to feminist legal theory as well as some philosophical works on the powers of storytelling. Narratives we will read include published literary fiction by women authors, but also selected legal cases. Instructor(s): Westphal.

**SWGS 405 AUSTEN ONLY (3)**

This course will try to come to terms with Jane Austen as author and icon. Material will include all her fiction as well as portions of her letters and biography. Recent film and television adaptations of her novels will also be critically examined. Cross-listed with ENGL 443. Instructor(s): Michie.

**SWGS 407 STUDIES IN FEMINIST LITERARY THEORY (3)**

A variable topics course designed to build on student knowledge of feminist theory gained earlier in the curriculum. Past topics have included sexualities, Marriage and Its Others, and Third Wave Feminism. Cross-listed with ENGL 481.

**SWGS 412 WOMEN AND WOMEN'S VOICES IN FRENCH LITERATURE (3)**

Introduction to women writers and to women as objects of representation in fiction and in poetry since the Revolution. Special attention to the body and to sexuality as these impinge both on writer and represented. Cross-listed with FREN 360. Pre-requisite(s): FREN 301 or FREN 311 or FREN 312 or FREN 336, or placement test or permission of instructor. Instructor(s): Harter.

**SWGS 415 SOCIOLINGUISTICS (3)**

Topic: Issues of language and gender, race and class. The course will begin with an overview of contemporary sociolinguistic theory and methodologies. We will then examine the linguistic consequences to speakers of the membership in groups, defined in terms of gender, race, and class. Cross-listed with LING 415. Instructor(s): Niedsielki.

**SWGS 420 WOMEN AND GENDER IN 19TH CENTURY EUROPE (3)**

Examination of the political and cultural discussions of the "Woman Question" in 19th-century Europe. Includes the role of public and private legal right in republicanism and the early feminist movement, gender equality in the context of 19th-century socialist movements, and the challenges to gender identity posed by cultural modernism. Cross-listed with HIST 349. Instructor(s): Wildenthal.

**SWGS 422 GENDER AND GLOBAL ECONOMIC JUSTICE (3)**

This course explores theoretical approaches to gender equality, human well-being and justice in local and global societies. Topics include: material, cultural and social influences on human well-being; the organization of productive and reproductive work, paid and unpaid work; children, family, and gender relations; globalization and economic justice; and the capabilities approach to human well-being. Limited enrollment. Instructor(s): Strassmann.

**SWGS 430 QUEER THEORY (3)**

An examination of key issues in queer theory that links those issues to other major literary and cultural theory of the past quarter century. As such, the course will also serve as an introduction to psychoanalytic theory, post-culturalism, deconstruction, postcolonial theory, film studies and recent work on the relationship between science and literature. Cross-listed with ENGL 498. Repeatable for Credit. Offered Spring. Instructor(s): Lamos.

**SWGS 432 WOMEN IN MUSIC (3)**

Topics will include emergence of Indian Muslim society; Muslim responses to colonialism and the movement for Pakistan; and the role of Islam in politics in contemporary India, Pakistan, and Bangladesh. Requires no prior knowledge of Islam or South Asia. Cross-listed with ASIA 432, HIST 432. Limited enrollment. Instructor(s): Shehabuddin.

**SWGS 440 WOMEN IN MUSIC (3)**

Study of gender in music, including aesthetics and representation, and of the major roles women have assumed in music, especially as composers, performers, and patrons. While the course emphasizes the Western art tradition, other types of music are explored as well. Cross-listed with MUSI 526. Limited enrollment. Instructor(s): Citron.

**SWGS 442 WOMEN IN RUSSIAN LITERATURE (3)**

The portrayal of women in major works of Russian literature, with particular attention paid to the women writers' presentation of women. No knowledge of Russian required. Instructor(s): Thompson.

**SWGS 444 FAMILY INEQUALITY (3)**

This is an intensive, upper-level seminar focused on aspects of inequality concerning American families. We will discuss how well-know modes of inequality such as race/ethnicity, gender, and social class affect individual families, as well as how families serve as agents of inequality along these lines. Cross-listed with SOCI 440. Limited enrollment. Instructor(s): Heard.

**SWGS 453 STUDIES IN AFRICAN AMERICAN LITERATURE (3)**

A variable topics course designed to build on student knowledge of African American literature gained earlier in the curriculum. Recent topics include Black Women Writers. Cross-listed with ENGL 470. Repeatable for Credit. Instructor(s): Fultz.

**SWGS 455 WOMEN, GENDER, AND SEXUALITY IN MEDIEVAL ISLAMIC SOCIETIES (3)**

Examination of the legal position and social realities of men and women in the Islamic world, with emphasis on how boundaries of gender have traditionally been drawn. Includes the family and sexual ethics, the harem, polygamy, divorce, and eunuchs (who played an important role in both the military and in certain religious institutions). Cross-listed with HIST 438, MDST 438. Limited enrollment. Instructor(s): Sanders.

**SWGS 462 20TH-21ST CENTURY AMERICAN LITERATURE AND CULTURE (3)**

A variable topics course designed to build on student knowledge of twentieth and twenty-first century U.S. literature and/or culture gained earlier in the curriculum. Recent topics have included social justice and contemporary fiction. Cross-listed with ENGL 462. Instructor(s): Lurie.

**SWGS 463 GENDER AND SOCIETY IN EARLY MODERN EUROPE (3)**

Exploration of the relationship between ideas about gender and the social, political, and legal institutions in Europe from c. 1350 to 1800. Includes the structure and role of the family, gender roles in religious institutions, and the regulation of sexuality. Cross-listed with HIST 443. Instructor(s): Quillen.

**SWGS 465 GENDER AND HEALTH (3)**

This course will examine the relationship between gender and health, both physical and mental. We will begin the semester by examining issues related to gender and health in the U.S. and spend the second half of the semester examining gender and health in an international context. Cross-listed with SOCI 465. Instructor permission required. Instructor(s): Gorman.

**SWGS 468 WOMEN AND THE U.S. WELFARE STATE: SEXUAL POLITICS AND AMERICAN POVERTY (3)**

Seminar in the history of women and welfare focuses on women's contributions to the growth of the welfare system and investigates how welfare has been shaped by understandings of gender, race, and class. Compares American programs to similar programs developed in other countries. Cross-listed with HIST 468. Limited enrollment. Instructor(s): Sneider.

**SWGS 470 SEX, SANCTITY, PSYCHOANALYSIS (3)**

An advanced mapping of the psychoanalytic study of religion through a close reading of psychoanalytically informed studies of saints, founding figures, and charismatic teachers, with a particular focus on sexuality and gender and their relationships to the expression and representation of holiness in the history of religions. Cross-listed with RELI 480. Graduate/Undergraduate version: SWGS 580. Limited enrollment. Instructor(s): Kripal; Parsons.

**SWGS 480 FEMINIST LITERARY THEORY (3)**

An introduction to the core concepts and writing of the field. Cross-listed with ENGL 382.

**SWGS 482 PROBLEMS IN CONTEMPORARY FEMINIST THEORY (3)**

The purpose of this course is to gain a broad understanding of the important problems of contemporary feminist theory. We will focus of the interrelated issues of gender, sexuality, race, ethics, language, and power by exploring in depth primary texts in feminist theory. Pre-requisite(s): WGST 101 and WGST 102 or permission of instructor.

**SWGS 485 GENDER AND HOLLYWOOD CINEMA IN THE 1950'S (3)**

This course examines representations of gendered subjectivity in Hollywood cinema during the 1950s. Some of the topics to be addressed include the uneasy relationships between normative domesticity and heterosexual masculinity, and issues of voyeurism and eroticism, and the ongoing conflict between liberated individualism and social conformity in corporate culture and bourgeois society. Cross-listed with HART 485. Limited enrollment. Instructor(s): Brennan.

**SWGS 486 MEDIA STUDIES (4)**

Topics vary from year to year.

**SWGS 495 INDEPENDENT STUDIES (1 TO 4)**

Open to SWGS majors only. Instructor permission required.

**SWGS 496 APPLIED WOMEN'S AND GENDER STUDIES (1 TO 3)**

Hours variable, 1-3 hours. Internship will be arranged individually at the request of students; details must be approved by the director. Students will also be required to submit a paper of between 8 - 15 pages (depending on the amount of credit) that demonstrates their ability to apply critically their knowledge of women's and gender studies. Department permission required. Repeatable for Credit.

**SWGS 498 RESEARCH IN THE STUDY OF WOMEN AND GENDER (3)**

Research seminar for SWG seniors to fulfill capstone requirement. Open to SWG majors only.

**SWGS 499 RESEARCH IN THE STUDY OF WOMEN AND GENDER (3)**

Research seminar for SWG seniors to fulfill capstone requirement. Open to SWG majors only.

**SWGS 501 FEMINIST DEBATES (3)**

This course identifies and traces three streams of thought by debates about major issues in women's studies. While the content of these streams will vary, the course will always be attentive to the historical and theoretical context of the debates in question and to the intersection of these debates with others. Topics might include: public and private spheres; the relation between the local and the global links between gender and sexuality; the problem of identity; the relation between activist and academic feminism.

**SWGS 502 GENDER, THE DISCIPLINES, AND INTERDISCIPLINARY (3)**

This course examines the relation between women's studies and the traditional disciplines. Topics include: disciplinarity, interdisciplinarity, and multidisciplinarity; the institutional place of women's studies; pedagogy in women's studies; and the relation of women's studies to area, global, ethnic, race, and sexuality studies. Students will produce a women's studies intro course syllabus and a paper to deliver at an interdisciplinary women's studies conference. Pre-requisite(s): SWGS 501.

**SWGS 503 DIRECTED READING (1 TO 3)**

Directed reading under the supervision of a SWG faculty member with permission of the instructor. May count only once toward major requirements. Instructor permission required. Offered Spring.

**SWGS 517 MEDIEVAL WOMEN WRITERS (3)**

An examination of the most significant medieval European women authors from the tenth through the seventeenth centuries, from the Byzantine Empire to France, Germany, Italy, England, Austria, Belgium, Bohemia, and Spain. Cross-listed with ENGL 517. URL: [www.ruf.rice.edu/~jchance/medwom.html](http://www.ruf.rice.edu/~jchance/medwom.html). Instructor(s): Chance.

**SWGS 520 SHAKESPEARE AND DIFFERENCE (3)**

Topics vary from year to year as needed. Cross-listed with ENGL 520. URL: [www.english.rice.edu](http://www.english.rice.edu).

**SWGS 522 FEMINIST ECONOMICS (3)**

This is an introductory course covering a range of theoretical and policy issues in contemporary feminist economics. Topics include: the social construction of economic knowledge; disciplinary debates; global economic issues relating to gender, race, ethnicity, and sexual orientation; economic justice; children and family policy; unpaid work; inequities in pay, wealth, and resources; and gender budgets. No prior training in economics is required. Limited enrollment. Instructor(s): Strassmann.

**SWGS 525 SEX, SELF, AND SOCIETY IN ANCIENT GREECE (3)**

Cross-listed with ANTH 525. Instructor(s): Faubion.

**SWGS 542 VICTORIAN FICTION (3)**

A variable topics course. Recent topics have included *The Victorian Marriage Plot and the History of the Novel, Part II*; and *Victorian and Modern Sexualities*. Cross-listed with ENGL 542. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**SWGS 545 WOMEN GENDER EUROPE BEYOND (4)**

Graduate seminar examining recent work in key areas of research on women and gender; nationalism; the modern welfare state; and the challenges which histories of working-class women have posed to definitions of politics, feminism, class, and family. Setting will include colonial Britain, India, Africa, Netherlands, Indonesia, France, and Germany. Cross-listed with HIST 545. Instructor(s): Wildenthal.

**SWGS 546 20TH CENTURY BRITISH LITERATURE (3)**

A variable topics course. Cross-listed with ENGL 546. Repeatable for Credit. URL: [www.english.rice.edu](http://www.english.rice.edu).

**SWGS 551 U.S. WOMEN'S HISTORY (4)**

Graduate reading seminar. Cross-listed with HIST 551. Instructor(s): Sneider.

**SWGS 556 SEMINAR IN LANGUAGE VARIATION (3)**

Topics vary from semester to semester. For this semester, we will take a more in depth look at language variation as it relates to gender and ethnicity. We will examine such variation from both quantitative and qualitative stand points. Cross-listed with LING 556. Repeatable for Credit. Instructor(s): Niedzielski.

**SWGS 576 RESEARCH TOPICS IN U.S. WOMEN'S HISTORY (4)**

Graduate seminar in U.S. women's history designed to introduce students to a growing body of literature on women and gender that is changing the way historians understand American history more broadly. By considering a variety of new scholarship, participants are introduced to the major questions that have engaged feminist historians for decades, as well as new questions that are just now beginning to shape the field. Cross-listed with HIST 576. Instructor(s): Sneider.

**SWGS 577 THE KNOWING BODY: BUDDHISM, GENDER, AND THE SOCIAL WORLD (3)**

Western thought tends to regard mind and body dualistically, a view with significant impact on religious, cultural, gendered, and social processes. This course juxtaposes received Western assumptions with Buddhist perspectives (especially Tibetan Buddhist), mapping Western and Buddhist categories onto each other to better understand the implications of each. Cross-listed with RELI 577. Graduate/Undergraduate version: SWGS 323. Instructor(s): Klein.

**SWGS 580 SEXUALITY, SANCTITY, AND PSYCHOANALYSIS (3)**

An advanced mapping of the psychoanalytic study of religion through a close reading of psychoanalytically informed studies of saint, founding figures, and charismatic teachers, with a particular focus on sexuality and gender and their relationships to the expression and representation of holiness in the history of religions. Cross-listed with RELI 580. Graduate/Undergraduate version: SWGS 470. Limited enrollment. Instructor(s): Kripal; Parsons.

**SWGS 581 CULTURAL STUDIES (3)**

A variable topics course. Recent topics have included Contemporary Issues in U.S. Culture, and Studies in Sexuality: Thinking Sex under Neo-Liberalism. Repeatable for Credit. Offered Fall. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Hennessy.

**SWGS 585 POSTCOLONIALISM AND AFTER (3)**

A course that serves both as an introduction to postcolonial theory and as a reevaluation of its political and ethical end vis-à-vis recent debates around globalization and cosmopolitanism. Cross-listed with ENGL 585. URL: [www.english.rice.edu](http://www.english.rice.edu). Instructor(s): Joseph.

**THEA (THEATRE)****School of Humanities/Visual and Dramatic Arts****THEA 100 THEATRE TECHNOLOGY (3)**

Introduction to materials, tools, and standard theatre production techniques. Theory and practice of lighting equipment and controls, scenic building and painting techniques, creation of props, sound support requirements, and running crew during performance. Lab hours required. Limited enrollment. Offered Fall. Instructor(s): Schlieff.

**THEA 101 THEATRE TECHNOLOGY: COSTUME CONSTRUCTION (3)**

Introduction to the materials, tools, and standard techniques of costume/clothing construction. Lab hours required. Limited enrollment. Offered Fall.

**THEA 102 INTRODUCTION OF ACTING (3)**

This is a class in the basic terminology and craft of acting. It will encompass voice and movement training, as well as basic technical theatre terminology and vocabulary for the actor. The course work will progress from ensemble/group work and individual exercises/ monologues to scenes. Space in classes is limited. Registration does not guarantee a place in class. The class roster is formulated on the first day of class by the individual instructor. Instructor(s): Keefe.

**THEA 300 INTRODUCTION TO THEATRE DESIGN (3)**

Introduction to the theory and practice of theatre design. Exploration of the principles and elements of design as they apply to scenery, lighting, and costumes with an emphasis on text analysis and research. Students will complete and present a variety of projects. Limited enrollment. Offered Fall. Instructor(s): Schlieff.

**THEA 301 ACTING I (3)**

Introduction to the fundamentals of acting through the exploration of actor training techniques based on the theories of Stanislavsky, Strasburg, Adler, and Hagen, emphasizing the actor's primary tools-voice, body, emotional life, and imagination. Final project is performed on stage for an audience. Limited enrollment. Offered Fall. Instructor(s): Rigdon.

**THEA 302 ACTING II (3)**

Text analysis for the actor with a particular emphasis on a thorough investigation of given circumstances and dramatic action. Students will rehearse and perform scenes from the works of contemporary playwrights. Final project is performed on stage for an audience. Pre-requisite(s): THEA 301 or permission of instructor. Limited enrollment. Instructor(s): Rigdon.

**THEA 303 INTRODUCTION TO THEATRE (3)**

A survey course of the art and theory of the theatre through an examination of dramatic literature from the Greeks through the modern era. The course will also explore the craft of the theatre as it is practiced today. Requires attending several theatre productions at theatres in Houston. Cross-listed with ENGL 390. Offered Fall. Instructor(s): Rigdon.

**THEA 304 COSTUME DESIGN (3)**

Advanced examination of the principles of costume design. Students will read and analyze a variety of plays in different periods and styles and then, based on text analysis and research, complete and present design projects using different rendering techniques. The role of the costume designer in collaboration with directors, actors, and other designers will also be explored. Pre-requisite(s): THEA 300. Not offered this academic year. Instructor(s): Rigdon.

**THEA 305 LIGHTING DESIGN (3)**

Exploration of the role that lighting plays in a production and the lighting designer's place as an artist in the collaboration process. Emphasis on the practical application of the controllable properties of light as they apply to theatre. Students will be required to complete a variety of projects including light labs responding to music and collaboration with Rice Dance Theatre on Spring production. Pre-requisite(s): THEA 300 or permission of instructor. Offered Spring. Instructor(s): Schlieff.

**THEA 306 SCENIC DESIGN (3)**

Advanced examination of the principles of scenic design including research, rendering, technical drawing, model construction, text analysis and the role of the scenic designer in collaboration with directors, actors, and other designers. Students will read and analyze a variety of plays in different periods and styles, and then, based on text analysis and research, complete and present design projects. Prerequisite(s): THEA 300 or permission of instructor. Offered Spring.

**THEA 310 ACTING III: THE SPOKEN TEXT (3)**

An exploration of language as one of the actor's primary means of communication and expression. The student will analyze, rehearse, and perform scenes from the work of William Shakespeare. Prerequisite(s): THEA 301 or permission of instructor. Recommended prerequisite(s): ENGL 321. Limited enrollment. Offered Spring. Instructor(s): Rigdon.

**THEA 312 DIRECTING I (3)**

An introductory course exploring the tools and craft of the stage director. Students will learn how to analyze dramatic text and will gain a fundamental knowledge of the director's basic skills, including composition, picturization, movement, rhythm, and pantomimic dramatization. Pre-requisite(s): THEA 301 or permission of instructor. Recommended prerequisite(s): THEA 303 and 300. Limited enrollment. Offered Fall. Instructor(s): Rigdon.

**THEA 322 DIRECTING SHAKESPEARE (3)**

Staging Shakespeare's plays for modern audiences learning to speak the lines "trippingly off the tongue", analyzing textual clues, and researching the period to find correlations to contemporary society in the process of active rehearsal. Students will work with THEA 310 to stage a final scene. Pre-requisite(s): THEA 301. Recommended prerequisite(s): THEA 310. Limited enrollment. Not offered this academic year. Instructor(s): Rigdon.

**THEA 323 VOICE AND SPEECH FOR THEATRE (3)**

Development of an expressive speaking voice through awareness and overcoming physical and vocal habits and limitations, including alignment, relaxation, breath support, resonance, tone and projection. Recommended prerequisite(s): THEA 301. Limited enrollment. Offered Spring.

**THEA 324 MOVEMENT FOR STAGE (3)**

Introduction to body dynamics and coordination through partner exercises, physical stretching and conditioning, ensemble movement, full body awareness, focus, centering, breath support, action and counter-action, precision, and economy of effort. Recommended prerequisite(s): THEA 301. Limited enrollment. Offered Spring.

**THEA 329 SPECIAL PROBLEMS: TECHNICAL, PRODUCTION (1 TO 6)**

Independent study. Pre-requisite(s): THEA 100 or THEA 101. Recommended prerequisite(s): THEA 303. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rigdon; Schlieff.

**THEA 331 THEATRE PRODUCTION (1 TO 6)**

Practical application of skills acquired in previous THEA courses in a realized production as a company member. Admission to class requires either an audition, interview, or portfolio review with the director and/or production manager. Possible roles include actor, assistant director, stage manager, assistant stage manager, designer, and technical support in scenery, costumes, lighting, or sound. Repeatable for Credit. Offered Spring. Instructor(s): Rigdon; Schlieff.

**THEA 431 SPECIAL PROBLEMS: HISTORY, LITERATURE (3)**

Independent study. Pre-requisite(s): THEA 303. Recommended prerequisite(s): THEA 321 Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rigdon; Schlieff.

**THEA 432 SPECIAL PROBLEMS: DIRECTING, DESIGN (1 TO 3)**

Independent study. Pre-requisite(s): THEA 301 and THEA 312 or permission of instructor. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rigdon; Schlieff.

**THEA 435 SPECIAL PROBLEMS: ADVANCED TOPICS (1 TO 3)**

Independent study. Pre-requisite(s): THEA 303 or THEA 301 or THEA 300. Repeatable for Credit. Offered Fall & Spring. Instructor(s): Rigdon; Schlieff.

**TIBT (TIBETAN)****School of Humanities/Religious Studies****TIBT 131 INTRODUCTION TO TIBETAN LANGUAGE AND CULTURE (3)**

Varied topics include traditional Buddhist texts as well as modern reflections on Tibet, film, and foundations of the Tibetan language. Cross-listed with RELI 131. Instructor(s): Klein.

**TIBT 132 ADVANCED TIBETAN LANGUAGE AND CULTURE (3)**

Focus on readings in Tibetan. Cross-listed with RELI 132. Repeatable for Credit. Not offered this academic year. Instructor(s): Klein.

**TIBT 133 ADVANCED TIBETAN LANGUAGE AND CULTURE (3)**

Continuation of first semester. We begin by learning the Tibetan alphabet, pronunciation, and then start reading Buddhist texts. Permission of instructor required. Cross-listed with RELI 133. Pre-requisite(s): RELI 131. Offered Spring. Instructor(s): Klein.



## UNIV (UNIVERSITY COURSES)

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### No College Designated/University Courses

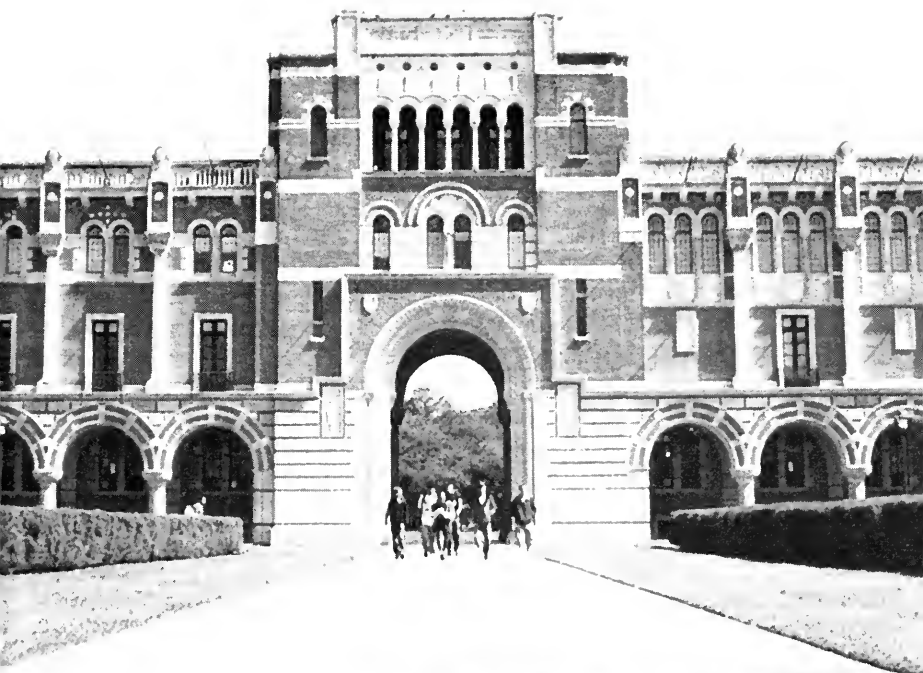
#### **UNIV 111 THE SUSTAINABLE ENVIRONMENT (3)**

This course is intended as an introduction to environmental studies and the concept of a sustainable environment for students from all divisions on campus. The course will focus on the scientific basis for our current environmental situation, on social and cultural attitudes and values relating to the environment as represented in literature, history, and public policy, and on the constant interaction among these various approaches. Must be in one of the following Classification(s): Freshman. Limited enrollment. Offered Fall & Spring. Instructor(s): Isle.

#### **UNIV 201 CENTURY SCHOLARS PROGRAM (1)**

Repeatable for Credit. Offered Fall & Spring.





Administration and Staff

## ADMINISTRATION

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Assistant to the President	Mark Davis
Assistant to the President	Cynthia L. Wilson
Assistant to the President, International Collaborations	David Vassar
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Dean of the George R. Brown School of Engineering	Sallie Keller-McNulty
Dean of the School of Humanities	Gary S. Wihl
Dean of the Jesse H. Jones Graduate School of Management	William H. Glick
Dean of the Shepherd School of Music	Robert Yekovich
Dean of the Wiess School of Natural Sciences	Kathleen S. Matthews
Dean of the School of Social Sciences	Lyn Ragsdale
Dean of Undergraduates	Robin Forman
Dean of Graduate and Postdoctoral Studies	TBN
Director of the James A. Baker III Institute for Public Policy	Edward P. Djerejian
Vice President for Administration	Kevin Kirby
Vice President for Enrollment	Chris Muñoz
Vice President for Finance	Kathy Collins
Vice President for Investments and Treasurer	Scott W. Wise
Vice President for Public Affairs	Linda Thrane
Vice President for Resource Development	Darrow Zeidenstein
General Counsel	Richard A. Zansitis
University Representative	Y. Ping Sun
Assistant	Rhonda L. Platt

## ADMINISTRATIVE OFFICES

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Academic Advising	Michele Daley
Academic and Research Computing	TBN
Administrative Systems	Randy Castiglioni
Admission	Julie Browning
Affirmative Action/Equal Employment Opportunity	Russell Barnes
Alumni Affairs	Mark Davis
Athletics	Chris Del Conte
Budget Office	Kathy Collins
Campus Store	Evelyn Morton
Career Services	Erik Larson
Cashier's Office	Patricia C. Ciampi
Civic Engagement	Stephanie Post
Community Involvement Center	Mac Griswold
Controller's Office	Evelyn Stewart
Counseling Center	Lindley Doran
Delivery Services	Ute Franklin
Disability Support Services	Jean Ashmore
Educational Outreach	Roland B. Smith Jr.

Emergency Medical Service (EMS)	Cathy A. Sunday
Enrollment: Administration	Diane Havlinek
Enterprise Applications	Andrea Martin
Environmental Health and Safety	Kathryn Cavender
Events Office	Amanda Lytz Hellman
Facilities and Engineering	Barbara White Bryson
General Counsel	Richard A. Zansitis
Housing and Dining	Mark Ditman
Human Resources	Mary A. Cronin
Institutional Effectiveness	John M. Cornwell
Institutional Research	Leona Urbish
International Programs (Study/Work Abroad)	Shannon Cates
International Students and Scholars	Adria Baker
Intramural and Club Sports	Tina Villard
KTRU General Manager	Will Robedee
Language Resource Center	Claire Bartlett
Media Relations and Information	B. J. Almond
Multicultural Affairs	Catherine E. Clack
Networking, Telecommunications, and Data Center	William Deigaard
Payroll Office	Darlene Banning
Police Department (RUPD)	Bill Taylor
President's Office	Cynthia L. Wilson
Provost's Office	Colleen F. Morimoto
Public Affairs	B. J. Almond
Registrar's Office	David Tenney
Research and Graduate Studies	Kellie Sims Butler
Research Computing	Kim Andrews
Scholarships and Fellowships	Kellie Sims Butler
Sponsored Research	Nancy Nisbett
Student Activities	Heather Masden
Student Affairs	Matt Taylor
Student and Recreation Center	Boyd Beckwith
Student Financial Services	Julia Benz
Student Health Services	Mark Jenkins, MD
Student Judicial Programs	Donald Ostdiek
Systems, Architecture, and Infrastructure	Barry Ribbeck
Telecommunications	Reggie Clarkson
Transportation Office	Eugen Radulescu
University Relations	Greg Marshall
Web Services	Jeff Frey
Wellness Center	Emily Page

## COLLEGE MASTERS

Baker College	Jose Aranda and Krista Comer
Brown College	John and Paula Hutchinson
Hanszen College	Wesley and Barbara Morris
Jones College	Rudy and Nancy Guerra
Lovett College	Bernard and Carolyn Aresu
Martel College	Gerald Dickens and Michelle McCormick
Sid Richardson College	Melissa Marschall and Michael Orchard
Wiess College	Michael Gustin and Denise Klein
Will Rice College	Mike Wolf and Paula Krisko

## FACULTY

## EMERITUS FACULTY

- Akers, William Walter**, 1947–93. Professor Emeritus in Chemical and Biomolecular Engineering  
BS (1943) Texas Technological College; MS (1944) University of Texas at Austin; PhD (1950) University of Michigan
- Alcover, Madeleine**, 1975–2004. Professor Emerita of French  
Licence de lettres modernes (1962), Diplôme d'études supérieures (1963), Doctorat de 3e cycle (1965) France
- Ambler, John S.**, 1964–2003. Professor Emeritus of Political Science  
BA (1953) Willamette University; MA (1954) Stanford University; Certificat d'études politiques (1955) University of Bordeaux; PhD (1964) University of California at Berkeley
- Andrews, John F.**, 1982–91. Professor Emeritus of Environmental Science and Engineering  
BSCE (1951), MS (1954) University of Arkansas; PhD (1964) University of California at Berkeley
- Apple, Max**, 1972–2001. Gladys Louise Fox Professor Emeritus of English  
BA (1963) University of Michigan; MA (1965) Stanford University; PhD (1970) University of Michigan
- Armeniades, Constantine D.**, 1969–2006. Professor Emeritus of Chemical and Biomolecular Engineering  
BS (1961) Northeastern University; MS (1967) Case Institute of Technology; PhD (1969) Case Western Reserve University
- Avé Lallemand, Hans G.**, 1970–2006. Professor Emeritus of Earth Science and Associate of Sid Richardson College  
BA (1960), MA (1964), PhD (1967) University of Leiden
- Bailar, Benjamin F.**, 1987–97. H. Joe Nelson III Professor Emeritus of Administration  
BA (1955) University of Colorado; MBA (1959) Harvard Graduate School of Business Administration
- Baker, Donald Roy**, 1966. Professor Emeritus of Geology and Honorary Associate of Brown College  
BS (1950) California Institute of Technology; PhD (1955) Princeton University
- Baker, Stephen D.**, 1963–2004. Professor Emeritus of Physics and Astronomy  
BS (1957) Duke University; MS (1959), PhD (1963) Yale University
- Bale, Allen M.**, 1947–78. Athletic Director Emeritus  
BS (1930) Rice Institute; MA (1939) Columbia University
- Bally, Albert W.**, 1981–96. Harry Carothers Wiess Professor Emeritus of Geology  
PhD (1953) University of Zurich, Switzerland
- Barker, J. R.**, 1949–86. Professor Emeritus of Health and Physical Education  
BS (1949) Rice Institute; MEd (1954) University of Texas at Austin
- Bixby, Robert E.**, 1984–98. Noah Harding Professor Emeritus of Computational and Applied Mathematics  
BS (1968) University of California at Berkeley; MS (1971), PhD (1972) Cornell University
- Boterf, Chester Arthur**, 1973–93. Professor Emeritus of Art  
BA (1959) Kansas University; MFA (1965) Columbia University
- Brelsford Jr, John W.**, 1970–2000. Professor Emeritus of Psychology  
BA (1960), MA (1961) Texas Christian University; PhD (1965) University of Texas at Austin
- Brotzen, Franz Richard**, 1954–86. Stanley C. Moore Professor Emeritus of Materials Science  
BS (1950), MS (1953), PhD (1954) Case Institute of Technology
- Brown, Katherine Tsanoff**, 1963–89. Professor Emerita of Art History and Honorary Associate of Will Rice College  
BA (1938) Rice Institute; MFA (1940) Cornell University
- Burrus, C. Sidney**, 1965–2005. Maxfield and Oshman Professor Emeritus of Electrical and Computer Engineering  
BA (1957), BSEE (1958), Rice Institute; MS (1960) Rice University; PhD (1965) Stanford University
- Burt, George**, 1984–97. Professor Emeritus of Theory and Composition  
BA (1955) University of California at Berkeley; MA (1958) Mills College; MFA (1962) Princeton University
- Camfield, William A.**, 1969–2002. The Joseph and Joanna Nazro Mullen Professor Emeritus of Art History  
AB (1957) Princeton University; MA (1961), PhD (1964) Yale University
- Campbell, James W.**, 1959–2000. Professor Emeritus of Biochemistry and Cell Biology  
BS (1953) Southwest Missouri State University; MS (1955) University of Illinois; PhD (1958) University of Oklahoma
- Cason, Carolyn**, 1956–74. Lecturer Emerita in Dietetics  
BS (1934) University of Texas at Austin; MA (1939) Columbia University
- Chapman, Alan Jesse**, 1946–95. Harry S. Cameron Professor Emeritus of Mechanical Engineering  
BSME (1945) Rice Institute; MS (1949) University of Colorado; PhD (1953) University of Illinois
- Clark, Howard Charles**, 1966–88. Professor Emeritus of Geology and Geophysics  
BS (1959) University of Oklahoma; MA (1965), PhD (1967) Stanford University

- Class, Calvin M.**, 1952–85. Professor Emeritus of Physics  
AB (1943), PhD (1951) Johns Hopkins University
- Copeland, James E.**, 1966–2001. Professor Emeritus of Linguistics and German  
BA (1961) University of Colorado; PhD (1965) Cornell University
- Curl Jr, Robert E.**, 1958–2005. University Professor Emeritus and Kenneth S. Pitzer-Schlumberger Professor Emeritus of Natural Sciences  
BA (1954) Rice Institute; PhD (1957) University of California at Berkeley
- Daichman, Graciela S.**, 1973–99. Lecturer Emerita of Hispanic Studies  
Profesorado (1959) Instituto Nacional del Profesorado en Lenguas Vivas, Argentina; MA (1975), PhD (1983) Rice University
- Davidson, Chandler**, 1966–2003. Radoslav A. Tsanoff Professor Emeritus of Public Affairs and Sociology and Research Professor  
BA (1961) University of Texas at Austin; MA (1966), PhD (1969) Princeton University
- Davis, Philip W.**, 1969–2003. Agnes Cullen Arnold Professor Emeritus of Linguistics  
BA (1961) University of Texas at Austin; PhD (1965) Cornell University
- Davis Jr, Sam H.**, 1957–2000. Professor Emeritus in Chemical and Biomolecular Engineering and Computational and Applied Mathematics  
BA (1952), BS (1953) Rice Institute; ScD (1957) Massachusetts Institute of Technology
- De Bremaecker, Jean-Claude**, 1959–94. Professor Emeritus of Earth Science  
Ingenieur Civil des Mines (1948) University of Louvain, Belgium; MS (1950) Louisiana State University; PhD (1952) University of California at Berkeley
- Dennis, John E.**, 1979–2002. Noah Harding Professor Emeritus of Computational and Applied Mathematics and Research Professor  
BS (1962), MS (1964) University of Miami; PhD (1966) University of Utah
- Dessler, Alexander J.**, 1963–93. Professor Emeritus of Space Physics and Astronomy  
BS (1952) California Institute of Technology; PhD (1956) Duke University
- Doughtie, Edward O.**, 1963–2001. Professor Emeritus of English  
AB (1958) Duke University; AM (1960), PhD (1964) Harvard University
- Drew, Katherine Fischer**, 1950–96. Lynette S. Autrey Professor Emerita of History  
BA (1944), MA (1945) Rice Institute; PhD (1950) Cornell University
- Dyson, Derek C.**, 1966–2000. Professor Emeritus of Chemical and Biomolecular Engineering  
BA (1955) University of Cambridge; PhD (1966) University of London
- Eifler, Margret**, 1973–2005. Professor Emerita of German and Slavic Studies  
BA (1962), MA (1964), PhD (1969) University of California at Berkeley
- Evans, Elinor Lucile**, 1964–85. Albert K. and Harry K. Smith Professor Emerita of Architecture  
BA (1938) Oklahoma State University; MFA (1954) Yale University
- Farwell, Joyce**, 1994–2005. Professor Emerita of Voice  
BME (1956), MME (1958) University of Oklahoma; DMA (1976) College Conservatory of Music, University of Cincinnati
- Fisher Jr, Frank M.**, 1963–2002. Professor Emeritus of Biology  
BA (1953) Hanover College; MS (1958), PhD (1961) Purdue University
- Freeman, John W.**, 1964–2000. Professor Emeritus of Space Physics and Astronomy, and Associate of Lovett College  
BS (1957) Beloit College; MS (1961), PhD (1963) University of Iowa
- Gardner, Gerald H. F.**, 1990–93. Professor Emeritus of Geophysics  
BS (1948) Trinity College, Dublin; MSc (1949) Carnegie Mellon University; PhD (1953) Princeton University
- Glass, Graham P.**, 1967–2005. Professor Emeritus of Chemistry  
BS (1959) Birmingham University, England; PhD (1963) Cambridge University
- Glass, Nancy**, 2006. Lecturer of Management  
MD, Baylor College of Medicine; MBA, Rice University
- Glantz, Raymond M.**, 1969–2006. Professor Emeritus of Biochemistry and Cell Biology  
BA (1963) Brooklyn College; MS (1964), PhD (1966) Syracuse University
- Gordon, Chad**, 1970–99. Professor Emeritus of Sociology  
BS (1957), MA (1962), PhD (1963) University of California at Los Angeles
- Gordon, William E.**, 1965–85. Distinguished Professor Emeritus of Space Physics and Astronomy and of Electrical and Computer Engineering  
BA (1939), MA (1942) Montclair State College; MS (1946), PhD (1953) Cornell University
- Grob, Alan**, 1961–2002. Professor Emeritus of English  
BA (1952) Utica College; MA (1957), PhD (1961) University of Wisconsin at Madison
- Hackerman, Norman**, 1970–85. President Emeritus and Distinguished Professor Emeritus of Chemistry  
AB (1932), PhD (1935) Johns Hopkins University

- Hale, Elton B.**, 1963–79. Professor Emeritus of Accounting  
BS (1937), MA (1940) Southwest Texas State Teachers College; PhD (1948) University of Texas at Austin
- Hansz, Ingrid**, 1987–2000. Lecturer Emerita of Hispanic Studies, 2001 Language Consultant for School of Continuing Studies  
BA (1952) Universidad de la Republica; MA (1987) Rice University
- Harcombe, Paul A.**, 1972–2007. Professor Emeritus of Ecology and Evolutionary Biology  
BS (1967) Michigan State University; PhD (1973) Yale University
- Harvey, F. Reese**, 1968–2003. Professor Emeritus of Mathematics  
BS, MA (1963) Carnegie Institute of Technology; PhD (1966) Stanford University
- Havens, Neil**, 1964–2000. Professor Emeritus of Art and Art History  
BA (1956) Rice Institute; MA (1959) Indiana University
- Haymes, Robert C.**, 1968–98. Professor Emeritus of Space Physics and Astronomy  
BA (1952), MS (1953), PhD (1959) New York University
- Hellums, Jesse David**, 1960–1998 and 2003–2005. A.J. Hartsook Professor Emeritus of Chemical and Biomolecular Engineering and of Bioengineering  
BS (1950), MS (1957) University of Texas at Austin; PhD (1961) University of Michigan
- Heymann, Dieter**, 1966–98. Professor Emeritus of Geology and Geophysics and Adjunct Professor in Chemistry  
MS (1954), PhD (1957) University of Amsterdam, The Netherlands
- Hightower, Joe W.**, 1967–2001. Professor Emeritus of Chemical and Biomolecular Engineering  
BS (1959) Harding University; MS (1961), PhD (1963) Johns Hopkins University
- Hodges, Lee**, 1930–71. Professor Emeritus of French  
BS (1930) Harvard University; MA (1934) Rice Institute
- Holt, Edward C.**, 1956–93. Professor Emeritus of Civil and Environmental Engineering  
SB (1945), SM (1947) Massachusetts Institute of Technology; PhD (1956) Pennsylvania State University
- Huddle, Donald L.**, 1964–92. Professor Emeritus of Economics  
BS (1959), MA (1960) University of California at Los Angeles; PhD (1964) Vanderbilt University
- Hyman, Harold M.**, 1968–97. William P. Hobby Professor Emeritus of History  
BA (1948) University of California at Los Angeles; MA (1950), PhD (1952) Columbia University
- Isle, Walter, Whitfield**, 1962–2007. Professor Emeritus of English  
AB (1955) Harvard University; MA (1957) University of Michigan; PhD (1961) Stanford University
- Jitcoff, Andrew N.**, 1950–72. Professor Emeritus of Russian  
Bachelor (1928), Master (1931) Prague Institute of Technology, Czechoslovakia
- Jones, Samuel**, 1973–97. Professor Emeritus of Music  
BA (1957) Millsaps College; MA (1958), PhD (1960) Eastman School of Music, University of Rochester
- Jump, J. Robert**, 1968–2003. Professor Emeritus of Electrical and Computer Engineering and of Computer Science and Honorary Master of Lovett College  
BS (1960), MS (1962) University of Cincinnati; MS (1965), PhD (1968) University of Michigan
- Kelber, Werner H.**, 1973–2005. Isla Carrol Turner and Percy E. Turner Professor Emeritus of Religious Studies  
MT (1963) Princeton Theological Seminary; MA (1967), PhD (1970) University of Chicago
- Kiperman, Anita**, 1976–98. Lecturer Emerita of Spanish  
BA (1957) Universidad Nacional de Buenos Aires; MA (1971) University of Houston
- Kobayashi, Riki**, 1951–97. Louis Calder Professor Emeritus in Chemical and Biomolecular Engineering  
BS (1944) Rice Institute; MSE (1947), PhD (1951) University of Michigan
- Konisky, Jordan**, 1996–2007. Professor Emeritus of Biochemistry and Cell Biology  
BS (1963), Providence College; PhD (1968) University of Wisconsin
- Lamb, Sydney M.**, 1981–98. Agnes Cullen Arnold Professor Emeritus of Linguistics and Cognitive Sciences  
BA (1951) Yale University; PhD (1958) University of California at Berkeley
- Laughery, Kenneth R.**, 1982–2002. Herbert S. Autrey Professor Emeritus of Psychology and Research Professor  
BS (1957), MS (1959), PhD (1961) Carnegie Mellon University
- Leal, Maria Teresa**, 1965–96. Professor Emerita of Spanish and Portuguese  
BA (1946) Pontificia Universidade Católica, Brazil; PhD (1963) Universidade Federal de Rio de Janeiro, Brazil
- Lecuyer, Maurice Antoine**, 1962–79. Professor Emeritus of French  
Baccalaureat es lettres (1937), Licence es lettres (1943), Diplome d'études superieures (1944) Université de Paris, France; PhD (1954) Yale University
- Lee, Eva J.**, 1969–2000. Professor Emerita of Kinesiology  
BS (1962) North Texas State University; MEd (1967) Sam Houston State University; EdD (1974) Louisiana State University
- Leeds Jr, J. Venn**, 1964–89. Professor Emeritus of Electrical and Computer Engineering  
BA (1955), BSEE (1956) Rice Institute; MSEE (1960), PhD (1963) University of Pittsburgh; JD (1972) University of Houston



- Leeman, William P.**, 1977–2005. Professor Emeritus of Earth Science  
BA (1967), MA (1969) Rice University; PhD (1974) University of Oregon
- Lewis, Edward S.**, 1948–90. Professor Emeritus of Chemistry  
BS (1940) University of California at Berkeley; PhD (1947) Harvard University
- Marcus, George E.**, 1975–2006. Emeritus Professor of Anthropology  
BA (1968) Yale University; PhD (1976) Harvard University
- Martin, William C.**, 1968–2005. Professor Emeritus of Religion and Public Policy and Professor Emeritus of Sociology  
BA (1958), MA (1960) Abilene Christian University; BD (1963) Harvard Divinity School; PhD (1969) Harvard University
- McEvelly, Thomas**, 1969–2005. Distinguished Lecturer Emeritus of Art History  
BA (1963) University of Cincinnati; MA (1965) University of Washington; MA (1968) University of Cincinnati
- McIntosh, Roderick J.**, 1980. Professor Emeritus of Anthropology  
BA (1973) Yale University; MLITT (1975), PhD (1979) Trinity College, University of Cambridge
- Meixner, John**, 1968–95. Professor Emeritus of English  
BA (1951) City College of New York; MA (1953), PhD (1957) Brown University
- Merwin, John E.**, 1955–98. Professor Emeritus of Civil and Environmental Engineering  
BA (1952), BSME (1953), MSME (1955) Rice Institute; PhD (1962) University of Cambridge
- Michel, F. Curtis**, 1963–2000. Andrew Hays Buchanan Professor Emeritus of Astrophysics  
BA (1955), PhD (1962) California Institute of Technology
- Miele, Angelo**, 1964–93. Foyt Family Professor Emeritus in Mechanical Engineering and Materials Science and Computational and Applied Mathematics  
Dr. CE (1944), Dr. AE (1946) University of Rome
- Minter, David Lee**, 1967–80 and 1990–2002. Bruce and Elizabeth Dunlevie Professor Emeritus of English  
BA (1957), MA (1959) North Texas State University; BD (1961), PhD (1965) Yale University
- Murray, William**, 1992–2003. Associate Professor Emeritus of Voice  
BA (1956) Adelphi University; Certificate (1958) Università de Perugia; Certificate (1958) Yale University School of Languages; Certificate (1960) Goethe Institute, Blaubeuren, Germany
- Nielsen Jr, Niels C.**, 1951–91. Professor Emeritus of Philosophy and Religious Thought and Honorary Associate of Will Rice College  
BA (1942) George Pepperdine University; BD (1946), PhD (1951) Yale University
- Nordgren, Ronald P.**, 1989–2000. Herman and George R. Brown Professor Emeritus of Civil and Environmental Engineering  
BS (1957), MS (1958) University of Michigan; PhD (1962) University of California at Berkeley
- O'Dell, Charles Robert**, 1982–2000. Andrew Hays Buchanan Professor Emeritus of Astrophysics  
BSEd (1959) Illinois State University; PhD (1962) University of Wisconsin at Madison
- Palmer, Graham A.**, 1974–2000. Professor Emeritus of Biochemistry and Cell Biology  
BS (1957), PhD (1962) University of Sheffield
- Pearson Jr, James Boyd**, 1965–99. J. S. Abercrombie Professor Emeritus in Electrical and Computer Engineering  
BSEE (1958), MSEE (1959) University of Arkansas; PhD (1962) Purdue University
- Pfeiffer, Paul E.**, 1947–97. Professor Emeritus of Computational and Applied Mathematics  
BSEE (1938) Rice Institute; BD (1943) Southern Methodist University; MSEE (1948), PhD (1952) Rice Institute
- Philpott, Charles William**, 1964–96. Professor Emeritus of Ecology and Evolutionary Biology  
BA (1957), MS (1958) Texas Technological College; PhD (1962) Tulane University
- Piper, William Bowman**, 1969–1999. Professor Emeritus of English  
BA (1951) Harvard University; MA (1952) Columbia University; PhD (1958) University of Wisconsin at Madison
- Poindexter, Hally Beth W.**, 1965–98. Professor Emeritus of Kinesiology  
BA (1947) Rice Institute; BS (1949) University of Houston; MA (1950) University of Northern Colorado; EdD (1957) Columbia University
- Polking, John C.**, 1968–2004. Professor Emeritus of Mathematics  
BS (1956) University of Notre Dame; MS (1961), PhD (1966) University of Chicago
- Raaphorst, Madeleine Rousseau**, 1963–89. Professor Emerita of French  
Baccalaureat es lettres (1939) Université de Poitiers, France; Licence en droit (1943) Université de Paris, France; PhD (1959) Rice Institute
- Rabson, Thomas A.**, 1959–2000. Professor Emeritus of Electrical and Computer Engineering  
BA (1954), BSEE (1955), MA (1957), PhD (1959) Rice Institute
- Rachford Jr, Henry H.**, 1964–82. Professor Emeritus of Mathematical Sciences  
BS (1945), MA (1947) Rice Institute; ScD (1950) Massachusetts Institute of Technology

- Rea, Joan**, 1968–2000. Professor Emerita of Hispanic Studies  
BA (1954) New York University; MA (1964) University of Houston; PhD (1970) University of Texas at Austin
- Sass, Ronald L.**, 1958–2005. Harry C. and Olga Keith Wiess Professor Emeritus of Ecology and Evolutionary Biology  
BA (1954) Augustana College; PhD (1957) University of Southern California
- Schoebelen, Anne**, 1974–2004. Joseph and Ida Kirkland Mullen Professor Emerita of Music  
BA (1958) Rosary College; MMus (1960), PhD (1966) University of Illinois
- Seed, Patricia**, 1982–2006. Professor Emerita of History  
BA (1971) Fordham University; MA (1975) University of Texas at Austin; PhD (1980) University of Wisconsin at Madison
- Sellers, James**, 1971–1993. Former Professor of Religious Studies  
BEE (1947) Georgia Institute of Technology; MS (1952) Florida State University; PhD (1958) Vanderbilt University
- Sims, James R.**, 1942–87. Herman and George R. Brown Professor Emeritus of Civil and Environmental Engineering  
BS (1941) Rice Institute; MS (1950), PhD (1956) University of Illinois
- Smith, Gordon W.**, 1968–2002. Professor Emeritus of Economics  
AB (1956) Washington University; PhD (1966) Harvard University
- Spence, Dale W.**, 1963. Professor Emeritus of Kinesiology  
BS (1956) Rice Institute; MS (1959) North Texas State University; EdD (1966) Louisiana State University
- Stebbing, Ronald F.**, 1968–95. Professor Emeritus of Space Physics and Astronomy  
BSc (1952), PhD (1956) University College, London
- Stokes, Gale**, 1968–2005. Mary Gibbs Jones Professor Emeritus of History  
BA (1954) Colgate University; MA (1965), PhD (1970) Indiana University
- Stormer Jr, John C.**, 1983–95. Cronis Professor Emeritus of Geology  
AB (1963) Dartmouth College; PhD (1971) University of California at Berkeley
- Subtelny, Stephen**, 1968–2000. Professor Emeritus of Ecology and Evolutionary Biology  
BA (1949) Hobart College; MA (1952), PhD (1955) University of Missouri
- Talwani, Manik**, 1985–2006. Professor Emeritus of Advanced Studies and Research in Earth Science  
BScHons (1951), MSc (1953) Delhi University; PhD (1959) Columbia University; PhD (Honoris Causa) (1981) Oslo University
- Taylor, Julie M.**, 1981–2005. Professor Emerita of Anthropology  
BA (1966) Harvard University; Diploma (1969), PhD (1973) Oxford University
- Thrall, Robert**, 1969–84. Noah Harding Professor Emeritus of Mathematical Sciences and Professor Emeritus of Administrative Science  
BA, MA (1935) Illinois College; PhD (1937) University of Illinois
- Todd, Anderson**, 1949–92. Gus Sessions Wortham Professor Emeritus of Architecture  
BA (1943), MFA (1949) Princeton University
- Trammell, George T.**, 1961–93. Professor Emeritus of Physics  
BA (1944) Rice Institute; PhD (1950) Cornell University
- Trepel, Shirley**, 1975–94. Professor Emerita of Violoncello  
BMus (1945) Curtis Institute of Music
- Urrutibéheity, Hector N.**, 1967–2000. Professor Emeritus of Hispanic Studies  
Profesorado (1956) La Plata National University, Argentina; PhD (1968) Stanford University
- Vail, Peter R.**, 1986–2001. W. Maurice Ewing Professor Emeritus of Oceanography  
AB (1952) Dartmouth College; MS (1953), PhD (1959) Northwestern University
- Van Helden, Albert**, 1970–2001. Lynette S. Autrey Professor Emeritus of History  
BEng (1962), MS (1964) Stevens Institute of Technology; MA (1967) University of Michigan; PhD (1970) University of London
- von der Mehden, Fred R.**, 1968–97. Albert Thomas Professor Emeritus of Political Science  
BA (1948) University of the Pacific; MA (1950) Claremont Graduate School; PhD (1957) University of California at Berkeley
- Wadsworth, Philip A.**, 1964–73. Professor Emeritus of French  
AB (1935), PhD (1939) Yale University
- Walker, James B.**, 1964–92. Professor Emeritus of Biochemistry and Cell Biology  
BS (1943) Rice Institute; MA (1949), PhD (1952) University of Texas at Austin
- Wall, Frederick T.**, 1972–79. Professor Emeritus of Chemistry  
BC (1933), PhD (1937) University of Minnesota
- Walters, G. King**, 1963–99. Sam and Helen Worden Professor Emeritus of Physics  
BA (1953) Rice Institute; PhD (1956) Duke University
- Wang, Chao-Cheng**, 1968–2000. Noah Harding Professor Emeritus of Computational and Applied Mathematics and Professor Emeritus of Mechanical Engineering and Materials Science  
BS (1959) National Taiwan University; PhD (1965) Johns Hopkins University

- Wells Jr, Raymond O.**, 1965–2000. Professor Emeritus of Mathematics  
BA (1962) Rice University; MS (1964), PhD (1965) New York University
- Whitaker Jr, Gilbert R.**, 1997–2007. H. Joe Nelson III Chair Emeritus of Business Economics  
BA (1966) Harvard University; Diploma (1969), PhD (1973) Oxford University
- Widrig, Walter M.**, 1969–2000. Professor Emeritus of Art History  
BA (1951) Yale University; MA (1956) Columbia University; PhD (1975) New York University
- Wilson, Joseph B.**, 1954–98. Professor Emeritus of German  
BA (1950), MA (1953) Rice Institute; PhD (1960) Stanford University
- Winkler, Michael**, 1967–2000. Professor Emeritus of German  
BA (1961) St. Benedict's College; MA (1963), PhD (1966) University of Colorado
- Wolf, Richard A.**, 1967–2002. Professor Emeritus of Physics and Astronomy  
BEngPhys (1962) Cornell University; PhD (1966) California Institute of Technology
- Wyschogrod, Edith**, 1992–2003. J. Newton Rayzor Professor Emerita of Religious Studies  
AB (1957) Hunter College; PhD (1970) Columbia University
- Young, Richard D.**, 1965–92. Professor Emeritus of Economics and Mathematical Sciences  
BA (1951), MA (1954) University of Minnesota; PhD (1965) Carnegie Institute of Technology

## FACULTY

- Aazhang, Behnaam**, 1985. J.S. Abercrombie Professor in Electrical and Computer Engineering  
BS (1981), MS (1983), PhD (1986) University of Illinois
- Abreu, Vitor dos Santos**, 2000. Adjunct Associate Professor of Earth Science  
BA (1984), MS (1990) Federal University of Rio Grande, Porto Alegre, Brazil; PhD (1997) Rice University
- Achard, Michel**, 1997. Associate Professor of French Studies and Linguistics  
BA (1983) University of Aix-en-Provence; MA (1987), PhD (1993) University of California at San Diego
- Adnan, Sarmad**, 2001. Adjunct Associate Professor of Mechanical Engineering and Materials Science  
BSME (1987) Ohio University; MS (1989), PhD (1992) Rice University
- Ajayan, Pulickel M.**, 2007. Benjamin M. and Mary Greenwood Anderson Professor in Mechanical Engineering and Materials Science  
BTech (1985) Banaras Hindu University, India; PhD (1989) Northwestern University
- Akin, John Edward**, 1983. Professor of Mechanical Engineering and Computational and Applied Mathematics  
BS (1964) Tennessee Polytechnic Institute; MS (1966) Tennessee Technological University; PhD (1968) Virginia Polytechnic Institute
- Albin, Verónica S.**, 1998. Senior Lecturer of Spanish  
BA (1989) Millersville University of Pennsylvania
- Aleman, Lawrence B.**, 1994. NMR Manager, Senior Research Scientist, and Lecturer of Chemistry  
BS (1975) City College of New York; PhD (1980) University of Chicago
- Alexander, David**, 2003. Andrew Hays Buchanan Associate Professor of Astrophysics and Associate Professor of Physics and Astronomy  
BSc (1985), PhD (1988) University of Glasgow, Scotland
- Alford, John R.**, 1985. Associate Professor of Political Science  
BS (1975), MPA (1977) University of Houston; MA (1980), PhD (1981) University of Iowa
- Alvarez, Pedro J. J.**, 2003. George R. Brown Professor; Department Chair of Civil and Environmental Engineering  
BEng (1982) McGill University; MSE (1989), PhD (1992) University of Michigan
- Al-Zand, Karim**, 2002. Lynette S. Autrey Assistant Professor of Composition and Theory  
BM (1993) McGill University; PhD (2000) Harvard University
- Amos, Christopher L.**, 2001. Adjunct Professor of Statistics  
BA (1980) Reed College; MS (1985), PhD (1988) Louisiana State University Medical Center
- Anandasabapathy, Sharmila**, 2007. Adjunct Assistant Professor in Bioengineering  
BA (1993) Yale University; MD (1998) Albert Einstein College of Medicine
- Anderson, Edward**, 2006. Lecturer in Classical Studies  
BA (1987) University of California at Berkeley; MA (1991) Middlebury College
- Anderson, John B.**, 1975. W. Maurice Ewing Chair in Oceanography and Professor of Earth Science  
BS (1968) University of South Alabama; MS (1970) University of New Mexico; PhD (1972) Florida State University
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