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Record of
The University of North Carolina
at Chapel Hill



School of
**Public
Health**

1991-1993

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**School of
Public
Health
1991-1993**



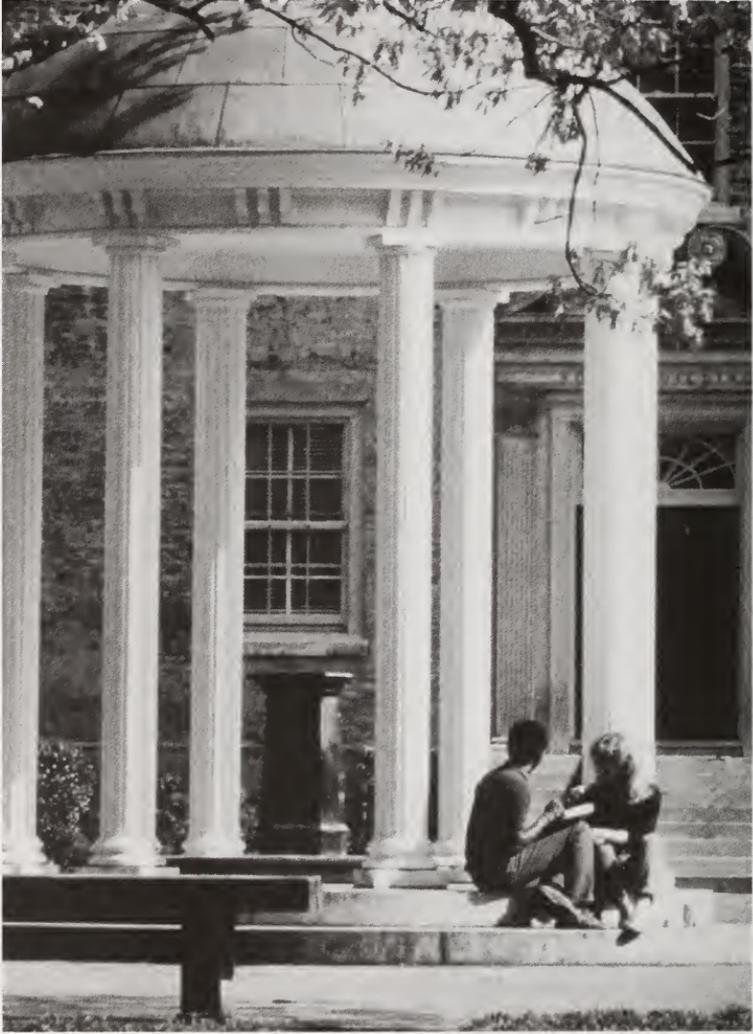
**Record of
The University of North Carolina
at Chapel Hill**

announcements for the sessions 1991-1993
the university of north carolina at chapel hill

1991-1993

Number 1038

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The University of North Carolina at Chapel Hill is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, age, or handicap. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Assistant to the Chancellor. Moreover, The University of North Carolina at Chapel Hill is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of black students.



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The University of North Carolina at Chapel Hill

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Mission Statement

The University of North Carolina at Chapel Hill has been built by the people of the State and has existed for two centuries as the nation's first state university. Through its excellent undergraduate programs, it has provided higher education to ten generations of students, many of whom have become leaders of the State and the nation. Since the nineteenth century, it has offered distinguished graduate and professional programs.

The University is a research university. Fundamental to this designation is a faculty actively involved in research, scholarship, and creative work, whose teaching is transformed by discovery and whose service is informed by current knowledge.

The mission of the University is to serve all the people of the State, and indeed the nation, as a center for scholarship and creative endeavor. The University exists to expand the body of knowledge; to teach students at all levels in an environment of research, free inquiry, and personal responsibility; to improve the condition of human life through service and publication; and to enrich our culture.

To fulfill this mission, the University must:

acquire, discover, preserve, synthesize, and transmit knowledge;

provide high quality undergraduate instruction to students within a community engaged in original inquiry and creative expression, while committed to intellectual freedom, to personal integrity and justice, and to those values that foster enlightened leadership for the State and the nation;

provide graduate and professional programs of national distinction at the doctoral and other advanced levels to future generations of research scholars, educators, professionals, and informed citizens;

extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life for all people in the State; and

address, as appropriate, regional, national, and international needs.

This mission imposes special responsibilities upon the faculty, students, staff, administration, trustees, and other governance structures and constituencies of the University in their service and decision-making on behalf of the University.

April 25, 1986, as adopted by the Board of Trustees, The University of North Carolina at Chapel Hill

University Calendar

1991-1992

Summer School, 1991

First Session

May 15, Wednesday

May 20, Monday

May 21, Tuesday

May 24, Friday

May 27, Monday

May 31, Friday

June 10, Monday

June 13, Thursday

June 20, Thursday

June 21-24, Friday-

Monday

Telephonic registration.

First day of classes.

Last day for late registration.

Last day to drop a course for credit on student's financial account.

Holiday, Memorial Day

Last day to drop courses (undergraduates).

Last day to withdraw for credit on student's financial account.

Last day to drop courses (graduates).

Last day of classes.

Final examinations.

Second Session

June 22, Saturday

June 26, Wednesday

June 27, Thursday

July 2, Tuesday

July 4, Thursday

July 9, Tuesday

July 16, Tuesday

July 22, Monday

July 29, Monday

July 30-31

Tuesday-Wednesday

Telephonic registration.

First day of classes.

Last day for late registration.

Last day to drop a course for credit on student's financial account.

Holiday, Independence Day.

Last day to drop courses (undergraduates).

Last day to withdraw for credit on student's financial account.

Last day to drop courses (graduates).

Last day of classes.

Final examinations.

Fall Semester, 1991

August 19, Monday	Telephonic registration opens.
August 17, Saturday	Residence halls open for freshmen and undergraduate transfer students at 10 A.M.
August 18, Sunday	Orientation of all new freshmen and undergraduate transfer students according to schedule to be announced.
August 18, Sunday	Residence halls open for returning students.
August 19-21, Monday-Wednesday	Registration according to schedule in Fall Class Schedule Booklet.
August 22, Thursday	Classes begin for all students. Late registration begins. Fee charged for late registration.
August 28, Wednesday	End of late registration and change in schedules. No registration accepted after this date.
September 2, Monday	Holiday, Labor Day
September 4, Wednesday	Last day to drop a course for credit on student's financial account.
October 2, Wednesday	Last day for dropping courses (undergraduates) and last day for Pass/Fail declarations.
October 4, Friday	Fall Recess—Instruction ends 5 P.M.
October 9, Wednesday	Instruction resumes 8 A.M.
October 9, Wednesday	Progress Reports for freshmen due.
October 11, Friday	Last day for both undergraduate and graduate students to file applications for degree to be awarded in December.
October 12, Saturday	University Day
October 23, Wednesday	Last day to withdraw for credit on student's financial account. Last day to withdraw without the semester being counted as a term in residence (undergraduates only).
October 26, Saturday	Telephonic registration for spring begins (See Spring Class Schedule Booklet for advising and registration dates).
November 9, Saturday	Written examinations for master's candidates for December graduation may not be taken after this date.
November 25, Monday	Last Day for graduate students to drop a course.
November 27, Wednesday	Thanksgiving Recess—Instruction ends 1 P.M.
December 2, Monday	Instruction resumes 8 A.M.
December 6, Friday	Final signed copies of doctoral dissertations and master's theses for candidates for the December graduation must be filed in the Graduate School by this date.
December 6, Friday	Fall Semester classes end.
December 7, Saturday	Reading day.
December 8, Sunday	Fall Recognition Ceremony.
December 9, Monday	Fall Semester examinations begin.
December 16, Monday	Fall Semester examinations end.

Spring Semester, 1992

January 6, Monday January 6-7, Monday-Thursday	Spring Semester and Telephonic registration open. Registration/schedule changes.
January 7, Tuesday January 8, Wednesday	Residence halls open. Classes begin for all students. Late registration begins. Fee charged for late registration.
January 14, Tuesday	End of late registration and change in schedules. No registration accepted after this date.
January 20, Monday January 21, Tuesday	Holiday, Martin Luther King, Jr. Last day to drop a course for credit on student's financial account.
February 4, Tuesday	Last day for both undergraduate and graduate students to file applications with Dean for degree to be awarded in May.
February 18, Tuesday	Last day for dropping courses (undergraduates) and last day for Pass/Fail declarations.
February 28, Friday March 9, Monday March 10, Tuesday	Spring Recess - Instruction ends 5 P.M. Instruction resumes 8 A.M. Last day to withdraw for credit on student's financial account. Last day to withdraw without the semester being counted as a term in residence (undergraduates only).
March 21, Saturday	Written examinations for master's candidates for May graduation may not be taken after this date.
To be announced	Pre-registration for summer and fall.
April 10, Friday April 17, Friday April 24, Friday April 24, Friday	Last day for graduate students to drop a course. Holiday, Good Friday. Spring Semester classes end. Final signed copies of doctoral dissertations and master's theses for candidates for the May graduation must be filed in the Graduate School by this date.
April 25, Saturday April 27, Monday May 4, Monday May 10, Sunday	Reading day. Spring Semester examinations begin. Spring Semester examinations end. Commencement.



University Information

Admission Policies

The regular entrance requirements of the Graduate School must be met by all students applying for admission to the School of Public Health.

The applicant must hold the bachelor's or master's degree from an accredited college or university with a grade average of B or better in the major subject area and must present credentials showing the completion of prerequisite courses for the special field he or she proposes to undertake in a graduate program. Only applicants with academic records of high quality should seek admission.

Graduate Record Examination scores are required for all applicants. The test should be taken no later than October to insure that scores will be submitted in time to process the application for fall admission. Applicants whose native language is not English are required to submit acceptable scores on the Test of English as a Foreign Language (TOEFL).

Work done in absentia will not be counted for graduate credit. However, in certain cases approved by the University Administration, part of the work on the thesis for a higher degree may be done elsewhere. All such work, even when credited, is subject to the final examination required for the degree.

All master's degrees are terminal degrees. To enroll in the doctoral program, the student must receive approval of the department and be readmitted to the Graduate School.

North Carolina law requires all students new to the University to document immunization records or undergo vaccination. Failure to comply results in cancellation of registration 30 days after classes begin.

Diversity among student backgrounds and points of view is desired. To that end, admissions committees also consider an applicant's accomplishments and personal qualities that are brought to their attention by the applicant or by his or her references. A careful evaluation of accomplishments and promise is at the heart of the process.

Application

A nonrefundable fee of \$35.00 must be submitted with the Application for Admission to the Graduate School.

The program of study in the School of Public Health is arranged in a sequence which makes it advisable for students to enter the School in the fall semester. Admission at other times is granted only for exceptional reasons.

Letters of inquiry regarding admission and requests for application forms should be addressed to the Dean, School of Public Health, CB# 7400, Rosenau Hall, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599-7400. It is advisable to apply for fall admission before February 1, although applications submitted as late as July 1 will be considered if space is available. To compete with heavy competition, applications and all supporting documentation should be received in the Graduate School by February 15.

An individual can be considered for a Graduate School award only when all materials are received by February 1. Information about School of Public Health

traineeships, scholarships and other financial assistance appears on pages 30-31 of this catalog. Additional information can be obtained from the departments.

An applicant who has been offered admission reserves his or her place by payment of a \$25.00 nonrefundable enrollment deposit which is credited against the 1st semester tuition. Advance deposits are not refundable if the applicant fails to enroll. Checks should be made payable to The University of North Carolina. Payment should be mailed directly to the University Cashier, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599-1400, along with an Admission and Deposit Record. No payment should be sent either to the Graduate School, to the School of Public Health, or to the department of one's major. Due to the number of applicants, your place will not be held if this deposit is not received within three weeks of the date of the admission letter.

Students who make the deposit and who attend the University on a fellowship, traineeship, or other award which pays the entire cost of tuition and fees directly to the University may obtain refund of the deposit after November 1.

Tuition and Fees¹

Tuition and fees are assessed on a semester basis and are due at registration. Payments may be made in advance, in person or by mail. However, the entire amount for tuition and fees is due by the last day of registration. Payments may be mailed to: University Cashier, The University of North Carolina at Chapel Hill, CB# 1400, 103 Bynum Hall, Chapel Hill, NC 27599-1400. Checks should be made payable to The University of North Carolina. The student's social security number should be shown on the face of the check. Accounts not paid in full by the last day of registration are subject to a late payment fee and the student's possible Registration Cancellation.

Graduate tuition and fees² per semester for bona fide residents of North Carolina are \$743.10. For out-of-state students, tuition and fees per semester are \$2,877.85. In addition, the following courses require field experience for which there is a fee:³

BIOS	191	\$ 25.00	HBHE	342	\$125.00	NUTR	251	\$450.00
ENVR	164	\$175.00	HBHE	343	\$125.00	NUTR	252	\$ 50.00
ENVR	165	\$200.00	HPAA	98	\$200.00	PHNU	196	\$150.00
HBHE	90	\$100.00	HPAA	209	\$450.00	PHNU	272	\$450.00
HBHE	240	\$450.00	MHCH	214	\$350.00	PHNU	301	\$150.00
HBHE	340	\$125.00	NUTR	152	\$ 25.00	PHNU	396	\$450.00
HBHE	341	\$125.00	NUTR	250	\$450.00			

Undergraduate tuition and fees per semester for residents of North Carolina are: \$546.85; for out-of-state students, \$2,880.60.

The curricula of certain of the departments extend through a summer period of 12 weeks. Tuition and fees for summer terms are prorated by number of hours taken. Maximum rates (9 hours or more) for each five and one half week period for graduate students are \$564.75 for in-state and \$2,616.75 for out-of-state students.

¹Tuition and fees are subject to change without notice. Amounts given are for semester system. Additional field fee courses may be established. These schedules have been revised to reflect the telephonic registration fee of \$5.00 for Spring 1991.

²All new graduate students are required to pay an Orientation Fee of \$8.00 and an ID card fee of \$5.00 for their initial semester.

³For up-to-date information on field fees contact the Dean's Office, School of Public Health or department of choice.

Thesis—0 credit hours (courses numbered 393–394) for in-state is \$365.60 and out-of-state is \$701.85 per semester or \$109.75 in-state and \$216.75 out-of-state per summer term.

The last day to *drop a course* for credit on student financial accounts is two weeks from the first day of classes for each semester.

Withdrawals are prorated over a period of nine weeks at a rate of one-tenth of the semester's bill after deduction of a \$25.00 administrative charge. The last date for credit on student financial accounts for *withdrawal* is nine weeks after registration.

Statutory Provisions Offering Lower Tuition Rates

The 1983 North Carolina General Assembly revised G.S. 116–144 to direct the Board of Governors of the University of North Carolina to fix the tuition and required fees charged to nonresident students. The Board of Governors identified two groups of nonresident students to which special tuition rates would be extended: undergraduate students deemed by their institutions to have special talents and qualifications and who are thereby awarded a scholarship of at least \$250 per academic year and graduate students who serve as teaching assistants or research assistants or in similar instructional or research assignments and who are paid a stipend of at least \$2000 per academic year.

A qualifying assistantship entitles the recipient to the privilege of paying tuition and fees at the same rate that is charged residents for tuition purposes of the State of North Carolina. The difference in the cost of tuition and fees for nonresidents and that for residents is provided as a scholarship in recognition of special talents and qualifications and does not represent compensation for the service component of the assistantship. All students are responsible for being aware of the requirements concerning residence status. A full summary of information on these provisions is set out in Appendix A.

Transportation and Parking

Any person parking a motor vehicle on campus between 7:30 A.M. and 5:00 P.M., Monday through Friday (7:30 A.M.–9:00 P.M. in resident student areas) must display the appropriate permit for that lot or parking area. After 5:00 P.M. students may park in any unreserved employee parking area without being cited.

Any student, except freshmen, may apply for a parking permit but the number of permits available is limited. Charges vary according to zone location. Pre-registration for the fall term is during the month of April for currently enrolled students. Permits are assigned according to Student Government recommendations. Students are responsible for being familiar with all parking regulations. The campus map has a summary of the rules and regulations and will be helpful in avoiding citations. **Warning:** Firelanes and areas zoned for permit parking are strictly enforced. Parking in violation could result in fines and possible towing.

Bus passes are available for purchase each day at the UNC-CH Transportation and Parking Office located off of Manning Drive near Morrison Dorm. Regular window hours are from 7:30 A.M.–5:00 P.M. Monday through Friday.

Student Services

Housing

University housing is an integral part of the educational program. The primary objective of the Department of University Housing is to provide eligible students a supportive environment within which to live while attending the University.

The physical quality and the integrity of the buildings are maintained at a level conducive to security and comfort in the belief that provision of a safe and healthy living environment supports and contributes to the learning process.

Information regarding residence hall accommodations is available by writing to: Department of University Housing, Contracts Office, CB# 5500 Carr Building, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599-5500.

A brochure and application regarding student family housing is available by writing to Student Family Housing Office, The University of North Carolina at Chapel Hill, CB# 5510, Community Services Building, Chapel Hill, North Carolina 27599-5510.

Some graduate students are housed in privately owned Granville Towers, which is located just off the UNC-CH campus about one block from the Carolina Inn. The three towers of these supervised residence halls have a cafeteria dining commons. The fee charged includes room and board. Information is available from Granville Towers Business Office, University Square, Chapel Hill, NC 27514-6201.

Student Health Service

The Student Health Service (SHS), a member of the Division of Student Affairs, is located in a facility in the northeastern corner of the medical center complex and has overall responsibility for the health care of all students in the University. Students who pay the student health fee for the current semester or summer session are eligible for health care in the SHS. The fee covers the cost of all services provided by SHS professionals including physicians, physician extenders, physical therapists, and mental health professionals. Laboratory and X-ray studies done at SHS require a nominal copayment. Additional charges are made for inpatient rooms, drugs, miscellaneous supplies, and laboratory and X-ray studies which must be obtained from UNC Hospitals or other outside laboratories. Spouses not enrolled in the university as students are eligible by paying the student health fee.

The SHS provides a comprehensive program of health care delivery including general outpatient and inpatient medical care, a pharmacy, and specialized clinics. Preventive services include immunizations and those other preventive services normally expected in any community or public health service facility. The Wellness Resource Center, staffed by SHS and trained peers, provides workshops, groups, and information on fitness, nutrition, human sexuality, contraception, relaxation, and alcohol abuse prevention.

Students are seen on an appointment basis during regular office hours Monday through Friday and one half day on Saturday. Refer to your phone directory for the correct numbers for the various clinics. After regular office hours and on weekends, nurses are available for acute care with medical and psychiatric backup. In general, students should go to the SHS first. Major problems may be referred to the UNC Hospitals Emergency Room. Students should be aware that UNC Hospitals services are *not* covered by the student health fee.

Because your health fee does not cover hospitalization, surgery and intensive care, it is strongly recommended that you have additional health insurance. See the Graduate School Catalog for additional information.

Recreation

The University gymnasias, swimming pools, tennis courts, golf course, and large athletic fields provide ample facilities for exercise and recreation. All are under the supervision and direction of a well-organized Department of Physical Education.

Alcoholic Beverages

A policy on student possession and consumption of alcoholic beverages in facilities of The University of North Carolina at Chapel Hill has been promulgated by the Vice Chancellor for Student Affairs, with the approval of the Chancellor, to inform students of the conditions under which alcoholic beverage use consistent with Federal, State, and local laws and ordinances is permitted in University facilities and on University property. Copies of the policy may be obtained from the Office of the Dean of Students or the Associate Vice Chancellor for Student Affairs; both are located in Steele Building.

Drug Policy (See Appendix A, page 146 for complete policy.)

Students, faculty members, administrators, and other employees of The University of North Carolina at Chapel Hill are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as "controlled substances" in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the University community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the University. Also, recent federal legislation requires, as a condition of employment, that any faculty or staff member engaged in the performance of a federal grant or contract must abide by the University's Drug Policy and must notify his or her dean, director, or department chair of any criminal drug statute conviction for a violation occurring in the work place not later than five days after the conviction.

Every student, faculty member, administrator, and other employee of the University is responsible for being familiar with and complying with the terms of the Policy on Illegal Drugs adopted by the Board of Trustees.

Smoking

In Fall 1975 by student referendum and Faculty Council action, smoking in classes was banned.

Beginning November, 1988, a no smoking policy was instituted for ALL School of Public Health facilities which include ALL areas (classrooms, hallways, elevators, restrooms, lounges, and private offices in Rosenau and McGavaran-Greenberg Halls). This ban prohibits the use of all tobacco products, including cigarettes, cigars, and pipes.

Libraries

The Health Sciences Library is situated across the street from Rosenau Hall, School of Public Health. The library has an excellent collection to support curricular, research, and patient care information needs consisting of approximately 250,000 volumes and 10,000 serial titles, over 4,400 of which are currently received.

Information Services librarians are available to aid users in locating information, to instruct in the use of library resources, and to provide additional resource assistance. Online search services, with access to MEDLINE and about a hundred

other databases, are also provided. Direct access to databases is offered in an electronic information center. Information Management Education Services faculty offer a variety of instructional programs, including orientation, workshops, and course lectures, designed to teach information management skills.

Other library facilities include the various departmental and school libraries and the general University Library. The Walter Royal Davis Library houses the general collection. The Robert B. House Undergraduate Library and the Louis Round Wilson Library were recently renovated to house the special collections, also available to graduate students.

University Career Planning and Placement Services

University Career Planning and Placement Services assists students who have, for the most part, identified their career direction.

Services for upperclassmen and graduate students include workshops on resume-writing, interviewing, and job-seeking skills; resume-referral to employers; individual counseling; on-campus interviewing; job vacancy notebooks; and a credentials file for students in selected curricula. Some services are limited to students in a UNC-CH degree or certification program who are within two semesters of graduation.

Additional resources and programs include occupational and employer information, career panels, career and graduate/professional school fairs, an automated job hot-line, and an alumni network service.

University Career Planning and Placement Services is located at 211 Hanes Hall. Office hours 8 A.M.-5 P.M. Resource Room hours 8 A.M.-8 P.M., M-Th.





School of Public Health

Dean's Office

Michel A. Ibrahim, M.D., M.P.H., Ph.D.

Dean

Ernest Schoenfeld, A.A.S., B.S., M.P.H., Dr.P.H.

Associate Dean for Administration

Robert B. Moorhead, B.A., M.P.A.

Associate Dean for Computing and Information Services

¹Donald L. Fox, B.S., Ph.D.

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Associate Dean for Community Health Service

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Assistant Dean of Students

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Assistant Dean for Public Relations and Alumni Affairs

Charles Rasberry, B.A., M.Div.

Director of Development

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Assistant to the Dean

Gary Lloyd,

Registrar

Linda Parker, B.A., M.Ed.

Special Assistant to the Dean

¹*Resigned as Associate Dean May 31, 1991*



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Michel A. Ibrahim, M.D., M.P.H., Ph.D.

Dean, ex officio

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Associate Professor of Health Policy and Administration

Dana Quade, B.A., Ph.D.

Professor of Biostatistics

Parker C. Reist, B.S., S.M., S.M., Sc.D.

Professor of Air and Industrial Hygiene, Department of Environmental Sciences and Engineering

Ernest Schoenfeld, A.A.S., B.S., M.P.H., Dr.P.H.

Associate Dean, ex officio

Hugh H. Tilson, M.D., M.P.H., Dr.P.H.

Adjunct Professor of Epidemiology, and Health Policy and Administration



Dean's Cabinet

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Dean of the School of Public Health and Professor of Epidemiology

Donald L. Fox, B.S., Ph.D.

Associate Dean for Academic Programs and Professor of Air Hygiene

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Chair and Professor of Environmental Sciences and Engineering

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Barbara S. Hulka, B.A., M.S., M.D., M.P.H.

Chair and Kenan Professor of Epidemiology

²**Mildred Kaufman, B.S., M.S.**

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Associate Dean for Administration

James R. Sorenson, B.A., M.A., Ph.D.

Chair and Professor of Health Behavior and Health Education

³**Steven Zeisel, B.S., M.D., Ph.D.**

Chair and Professor of Nutrition

Representatives of the Student Union

¹*Appointed Chair and Professor 1989*

²*Retired as Chair and Professor July 1990*

³*Appointed Chair and Professor September 1, 1990*



School of Public Health Mission Statement

The mission of the School of Public Health is to improve the health and well-being of the population. This mission is accomplished through the interaction of:

- *Teaching*—to educate students to assume and to continue professional and leadership roles in public health practice, policy, research, and teaching.
- *Research (basic and applied)*—to advance knowledge and understanding of the biological, social, behavioral, environmental, and economic factors affecting the health status of the population.
- *Service and Professional Practice*—to provide broad-based technical assistance and consultation on public health issues in the public and private sectors at local, state, national and international levels.

General Information

The School of Public Health was organized in 1936 as a division within the School of Medicine at The University of North Carolina. Separate status as a school of public health was granted in 1939 and the first graduate degrees awarded in 1940. The fourth school of public health in the nation, the UNC School of Public Health was the first such school established within a state university.

It is today, with the Schools of Medicine, Dentistry, Nursing and Pharmacy, a unit of the Division of Health Affairs. The original departments of the School were Epidemiology, Parasitology (changed in 1968 to Parasitology and Laboratory Practice, merged with Epidemiology in 1990), Public Health Administration (changed to Health Administration in 1969 and to Health Policy and Administration in 1982), and Sanitary Engineering (changed in 1962 to Environmental Sciences and Engineering). Four additional departments (Biostatistics, Health Behavior and Health Education, Maternal and Child Health, Nutrition) and one curriculum (Public Health Nursing) are currently operating. All departments and curricula participate in research in a variety of areas and in field service to the state, region and the nation.

In addition to the departments and curriculum, two divisions operate within the School. The Division of Community Health Service extends the service capabilities and promotes the School's commitment to community service as its public responsibility. The Division of Computing and Information Services serves the computing and information management needs of faculty, staff, and students in administration, education and research.

The School of Public Health is one of twenty-four such schools in the United States accredited by the Council on Education for Public Health. The Curriculum of Public Health Nursing is accredited by the National League for Nursing, the programs in air and industrial hygiene and water resources engineering in the Department of Environmental Sciences and Engineering by the Accreditation Board for Engineering and Technology, and the Department of Health Policy and Administration by the Accrediting Commission of Education for Health Service Administration.

Degrees offered by the School of Public Health include an undergraduate degree (BSPH); the graduate academic degrees of Master of Science (MS); and Doctor

of Philosophy (PhD); and the graduate professional degrees of Master of Public Health (MPH), Master of Science in Public Health (MSPH), Master of Healthcare Administration (MHA), Master of Science in Environmental Engineering (MSEE), and Doctor of Public Health (DrPH). All requirements of the graduate professional degrees are administered by the faculty of the School of Public Health with the approval of the Administrative Board of the Graduate School.

Close affiliations are maintained with other graduate schools and departments of the University of North Carolina campuses, as well as with other schools and universities, health and human services agencies and research organizations. These affiliations are local, statewide, national, and international in scope. The nature of the affiliations includes joint sponsorship and effort in teaching and research programs, joint faculty appointments, and establishment of field training centers for students in a number of official and voluntary international, federal, state and local health and human service organizations.

The School of Public Health has an active recruitment program for minorities.

Students in the School of Public Health have the same rights and privileges accorded all students at The University of North Carolina at Chapel Hill. They may take courses in other departments of the University, North Carolina State University, and Duke University provided they are properly qualified and have the approval of their faculty advisers. Certain courses in chemistry, biochemistry, microbiology, economics, education, political sciences, social work, sociology, anthropology, and statistics have an especially close relationship to public health.

The School of Public Health admits only those students who would be expected to profit most by the educational program offered. It reserves the right to limit the number of students admitted to any course and drop from the roll any student whose work is unsatisfactory for any reason. It will be assumed that all applicants have assented to these conditions.

Academic Information

Degrees Offered

The School of Public Health offers one undergraduate degree, Bachelor of Science in Public Health, and seven graduate degrees: Master of Public Health, Master of Science in Public Health, Master of Healthcare Administration, Master of Science, Master of Science in Environmental Engineering, Doctor of Philosophy, and Doctor of Public Health. Degrees are awarded in May, August, and December, although formal commencement exercises are held only in May. Any student who desires to proceed in a doctoral program must be recommended to the Graduate School by his/her major department.

The general description of requirements for each degree follows. Explanation of the various programs of study in the different areas of specialization is found under the heading of each department in a later section in the catalog. Courses and programs described in this catalog have been approved by the University faculty and administration as of February 1, 1991. For full current information contact the department or curriculum involved.

Bachelor of Science in Public Health

The undergraduate degree programs of the School of Public Health lead to a Bachelor of Science in Public Health (BSPH) degree. Students wishing to obtain

the BSPH degree typically spend two years in the General College of the University of North Carolina at Chapel Hill (or in equivalent academic study elsewhere) and two subsequent years under the administration of the School of Public Health. A few persons with a prior bachelor's degree may also be admitted each year to study for the BSPH degree. Interested persons may obtain admission applications and additional information from the Registrar's Office, CB# 7400, 138 Rosenau Hall, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599-7400, or by calling (919) 966-2499.

Since enrollment in the BSPH degree programs is limited, completion of the prescribed freshman-sophomore prerequisites does not assure the student a position in the School of Public Health in the junior or a later academic year. Student selections are made, typically in the latter half of the sophomore year of course-work, on a *competitive* basis with consideration of academic achievement and personal qualifications.

The undergraduate public health degree programs combine features of a broad-based education with study in the professional area of public health. These programs seek to prepare individuals for professional positions in health and related fields, to provide a firm base for later graduate study, and to provide for general enrichment of the future lives of the students.

There are five BSPH degree program majors: *Biostatistics*, *Environmental Science and Policy*, *Health Behavior and Health Education*, *Health Policy and Administration*, and *Nutrition*.

The *Biostatistics* major gives students preparation in application of quantitative knowledge to a variety of health and related matters dealing, for example, with the physical environment; the population; patterns of disease, disability, and death, and the costs and effects of health services. Course-work in mathematics is a prerequisite for this major.

The undergraduate *Environmental Science and Policy* major is directed towards developing an understanding of: (1) the physical principles governing behavior of the environment, such as the production, transport and fate of materials in the air, water, oceans, ecological systems, etc.; (2) the historical development of society's response to environmental problems; (3) the scientific/social/political/economic factors involved in the generation, conception and solution of environmental problems; and (4) the various viewpoints that might be adopted in analyzing the acceptability of proposed solutions. These goals require the student to gain a broad background in the sciences and mathematics, as well as specialized knowledge from the social sciences. In particular, emphasis is placed on the principles of chemistry, biology, physics and mathematics as they apply to the behavior of environmental systems. Additional coursework is taken in the more specialized fields of environmental science, ecology, marine sciences and policy analysis.

The undergraduate *Health Behavior and Health Education* major is concerned with ways to help people of diverse backgrounds improve their well-being in the most healthful way. Special attention is given to the role of community organization. Courses in psychology, anthropology, and sociology are desirable prerequisites for this major. This course-work in the program includes an extended period of field training in which students may help plan, conduct, and evaluate educational programs for professional and lay groups in a variety of settings.

The undergraduate major in *Health Policy and Administration* prepares students to (1) assume positions requiring basic administrative operational skills in such areas as financial management, supervision, planning, and general administration and (2) pursue graduate study in a variety of fields, including health, business and public administration, law, social work and medicine. Basic economics and accounting courses are prerequisites for this major. Summer field placements for the students

may be in a hospital, nursing home, public health department, or other similar organizations.

The *Nutrition* undergraduate major emphasizes the relationship between nutrition and health. This program is designed to meet the educational objectives of students with at least two alternative career goals; (1) entry level positions in community nutrition and dietetics, and (2) preprofessional study for careers in medicine, dentistry, and other health fields. Basic courses in biology and chemistry are prerequisites for admission.

Requirements for the BSPH degree are as follows:

1. At least 120 semester hours of courses, not counting physical education activities courses. A 2.0 (C) average on all work attempted at The University of North Carolina at Chapel Hill. The last 30 hours of degree credit taken in residence in Chapel Hill.
2. A freshman-sophomore pattern of approximately 60 semester hours of courses, which must include:
 - a. English 1, 2
 - b. Course-work through Foreign Language 3 (or placement credit in Foreign Language 4), with no graduation credit given for Foreign Language 1 of the high school foreign language.
 - c. Two courses from the Mathematical Sciences option of the General College of the University.
 - d. Biology 11, 11L and an additional acceptable Natural Sciences Perspective course.
 - e. Two acceptable Social Sciences Perspective courses (from two different departments).
 - f. Two acceptable Aesthetic Perspective courses (one in literature and one in fine arts).
 - g. One acceptable Philosophical Perspective course.
 - h. Two acceptable Western Historical/Non-Western/Comparative Perspective courses, including one covering a period of Western History before 1700.
 - i. Two physical education activities courses.
3. A junior-senior total of approximately 60 semester hours to include Biostatistics 101 (or 110), Environmental Sciences and Engineering 51, Epidemiology 160, and a minimum of three electives outside the School of Public Health.
4. A satisfactory major in one of the five fields of concentration.

For additional information and specific requirements for each area of concentration see *The Undergraduate Bulletin* of the University.

Note

The minimum undergraduate admission requirements to begin with the fall 1988 semester are:

- A high school *diploma* or its equivalent;
- Four (4) course units in college preparatory *English*;
- Three (3) course units in *mathematics*, including geometry, algebra I, and algebra II;
- Two (2) course units in *social studies*, including one (1) unit in U.S. history and one (1) unit in government and economics;
- Three (3) course units in *science*, including at least one (1) unit in a life or biological science and at least one (1) unit in a physical science, and including at least one (1) laboratory course.
- At least two (2) course units in one foreign language.

It is recommended that prospective students take one (1) foreign language course unit and one (1) mathematics course unit in the twelfth grade.

Degree Programs Offered In School of Public Health

	BSPH	MPH	MSPH	MHA	MS	MSEE	DrPH	PhD
Biostatistics	■	■			■		■	■
Environmental Sciences and Engineering	■	■	■		■	■		■
Epidemiology		■	■				■	■
Health Policy and Adminstration	■	■	■	■			■	■
Health Behavior and Health Education	■	■	■				■	■
Maternal and Child Health		■	■				■	
Nutrition	■	■					■	
Public Health Nursing		■			■			

Master of Public Health

The program is designed to prepare students for positions which require a considerable breadth of knowledge of the whole field of public health but a lesser degree of specialization in one area. Thus students in this program may take nearly half of their courses outside the major department or curriculum, and will undergo extensive field training if previous experience is not deemed sufficient by criteria set by the student's department or curriculum. Typically, Master of Public Health students will have already acquired education in a health or health related profession, or have at least three years of experience in a field germane to public health.

The Master of Public Health degree is predominantly a terminal degree, but qualified students may proceed in the School of Public Health to a DrPH program for advanced study and further qualification.

Field of Specialization

Programs of study leading to the Master of Public Health degree are offered by all departments and curriculum in the School. Detailed descriptions are found in the sections describing the program areas in this catalog.

Requirements for Admission

1. a. A prior doctoral degree (such as MD, DVM, DDS, JD, or equivalent) from approved schools. Other doctoral degrees from approved schools may also qualify the applicant, depending upon the department to which application is being made and the relevance of the background to the department's field; or
- b. A prior master's degree (professional or academic) from approved schools provided the prior training is relevant to the basic field of the department or curriculum to which the student is applying as determined by the policies of that department or curriculum; or
- c. A bachelor's degree from approved schools, including a strong undergraduate record overall, with an average grade of B or better in the subject of the major. The course content should meet the policies of the depart-

ment or curriculum to which the student is applying. Some departments/curricula require specific tests such as the GRE of applicants. Applicants with less than a B average in the subject of the major must take the GRE test.

2. In most departments or curriculum, the applicant must have had relevant experience in a health related agency or organization prior to matriculation. Established policy may credit experience prior to admission by reducing the length of the program or permitting a waiver for field training. The extent and nature of required field training is also subject to established policy of the program area.
3. Special additional requirements by departments or curriculum, as specified.

Requirements for the Degree

1. **Residence:** No less than two semesters are required, but a more extended period for majors in various programs may be needed. For those students in joint programs with selected other professional schools on this campus which have been approved by the Graduate School, credit toward one semester of residence may be obtained by enrolling in and receiving credit for at least fifteen semester hours (usually five courses) in the School of Public Health while registered in the other school. Students attempting to obtain the MPH degree simultaneously with another graduate school degree must register full time in the School of Public Health for at least one semester.
2. **Course Requirements:** Candidates for the MPH degree shall meet each of the following three sets of course requirements; any course which partially satisfies two requirements may simultaneously be used for both.
 - a. *Depth.* Each candidate shall successfully complete a major in one of the departments or curriculum of the School, by satisfying whatever requirements that department or curriculum may set.
 - b. *Breadth.* Each candidate shall successfully complete at least four health-related courses in at least three different departments or curriculum other than the major. No portion of this requirement may be waived.
 - c. *Specifics.* Each candidate shall successfully complete
 - (1) at least one course in the Department of Biostatistics,
 - (2) at least one course in the Department of Epidemiology,
 - (3) a basic course covering the physical, biological, and/or social/behavioral factors which affect the health of the community, and
 - (4) at least one course relevant to health services delivery systems: except that any of these courses may be waived on the basis of a suitable display of proficiency, as approved by the candidate's adviser and the instructor of the course concerned.
3. **Admission to Candidacy:** An application for admission to candidacy which includes the total course program and title of written report (see below) must be filed with the Graduate School about three months before the expected date of graduation. The specific deadline is given in the calendar of events in this catalog.
4. **Substitutes for the Master's Thesis:** Candidates for the MPH, MSPH, and MSEE degrees who do not write a Master's Thesis must write a Master's Paper as a substitute. The School of Public Health has specified the following guidelines for this substitute.
 - a. The Master's Paper should show some synthesis of knowledge, and advance or contribute to the (appropriate specialized area of the) field of Public Health.

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- b. In connection with the Master's Paper, each candidate will register for at least one hour of credit in XXXX 392 (where XXXX is the department or curriculum acronym), or some other course approved for this purpose by the School.
 - c. Each Master's Paper must be approved by at least two members of the Graduate Faculty. The candidate will submit the paper to the department or curriculum, including a title page showing the approving signatures, in accordance with the University calendar.
 - d. Approved Master's Papers will be kept at least five years in a public file (usually in the Departmental Library or Reading Room).
5. **A Supervised Field Training** lasting 6 to 12 weeks, or a practicum within the department or curriculum. Policy of the program may permit this requirement to be waived on grounds that
- a. the student has had adequate prior supervised experience in the application of the methodology of his specialty, and,
 - b. the student has substituted a satisfactory learning experience which clearly serves his or her educational goals better than field training or a practicum would.
6. **Final Written or Oral Examination:** The examination must be taken at least one month before the degree is expected. The specific deadline is given in the calendar of events in this catalog. The focus is on work taken in the major department or curriculum; but, depending on the program policy, it may extend to other scientific and professional areas in which a department or curriculum would expect its students to be knowledgeable.
7. **Time Limitation:** All requirements of the degree must be completed within five years from the time the student first matriculated in the program.

Master of Science in Public Health

The Master of Science in Public Health program is designed to prepare students for professional careers in specialized areas of public health. Thus, its students will take courses mainly in one major department or curriculum of the School of Public Health, although there are also core requirements which provide for orientation to a broader view of public health. The Master of Science in Public Health degree is usually terminal, but it and the Master of Science degree, more than the Master of Public Health, tend to be the precursor to a doctoral program.

Fields of Specialization

Programs of study leading to the Master of Science in Public Health degree are offered by the following departments: Environmental Sciences and Engineering, Epidemiology, Health Behavior and Health Education, Health Policy and Administration, and Maternal and Child Health. Descriptions of these programs are found in the sections describing the departments in this catalog.

Requirements for Admission

1. A bachelor's degree from an approved school in a program that included course content as prescribed by approved policies of the department to which the student is applying;
2. A strong undergraduate record overall, with an average grade of B or better in the subject of the major. Some departments require specific tests such as the GRE of all applicants. Applicants with less than a B average in the subject of the major must take the GRE test.

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3. Special additional and/or more stringent requirements by departments, as specified.

Requirements for the Degree

1. **Residence:** A minimum period of residence of not less than two semesters is required. However, most students will need more time to satisfy the course requirements in specific programs. Students attempting to obtain the MSPH simultaneously with another Graduate School degree must register full time in the School of Public Health for one semester.
2. **Course Program:**
 - a. Within the minimum of 30 semester hours needed for graduation in each department, each candidate shall successfully complete:
 - (1) at least one course in the Department of Biostatistics,
 - (2) at least one course in the Department of Epidemiology,
 - (3) a basic course covering the physical, biological, and/or social/behavioral factors which affect the health of the community, except that any of these courses may be waived on the basis of a suitable display of proficiency, as approved by the candidate's adviser and the instructor of the course concerned.
 - b. In addition, each candidate shall complete at least 15 semester hours in the specialized field as specified by the department.
3. **Admission to Candidacy:** An application for admission to candidacy which includes the total course program and title of written report (see below) must be filed with the Graduate School about three months before the expected date of graduation. The specific deadlines given in the calendar of events in this catalog.
4. **Substitutes for the Master's Thesis:** Candidates for the MPH, MSPH, and MSEE degrees who do not write a Master's Thesis must write a Master's Paper as a substitute. The School of Public Health has specified the following guidelines for this substitute.



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- a. The Master's Paper should show some synthesis of knowledge, and advance or contribute to the (appropriate specialized area of the) field of Public Health.
 - b. In connection with the Master's Paper, each candidate will register for at least one hour of credit in XXXX 392 (where XXXX is the department acronym), or some other course approved for this purpose by the School.
 - c. Each Master's Paper must be approved by at least two members of the Graduate Faculty. The candidate will submit the paper to the department, including a title page showing the approving signatures, in accordance with the University calendar.
 - d. Approved Master's Papers will be kept at least five years in a public file (usually, in the Departmental Library or Reading Room).
5. **Final Written or Oral Examination:** The examination must be taken at least one month before the degree is expected. The specific deadline is given in the calendar of events in this catalog. The focus is on work taken in the major department; but, depending upon departmental policy, it may extend to other scientific and professional areas in which a department would expect its students to be knowledgeable.
 6. **Time Limitation:** All requirements of the degree must be completed within five years from the time the student first matriculated in the program.

Master of Healthcare Administration

The Master of Healthcare Administration program, Department of Health Policy and Administration, is designed to prepare students for management careers in healthcare organizations. Graduates will be prepared to take positions in staff or line management, or as consultants in hospitals, health maintenance organizations, clinics, public health departments, and other healthcare settings.

Requirements for Admission

1. A bachelor's degree from an approved school. Preparation in microeconomics, college-level mathematics, and financial accounting, although not formally required for admission, is strongly advised.
2. A strong undergraduate record overall, with an average grade of B or better in the subject of the major. Applicants are required to take either the GRE or the GMAT.

Requirements for the Degree

1. **Residence:** A minimum period of residence of not less than two semesters is required. However, most students typically need four semesters to satisfy the course requirements for this program.
2. **Course Program:**
 - a. The program requires a minimum of 51 semester hours of courses, plus field training. Each candidate shall successfully complete:
 - (1) at least one course in the Department of Biostatistics,
 - (2) at least one course in the Department of Epidemiology.
 - b. In addition, each candidate shall complete the department degree core and specialty concentration requirements.
3. **Admission to Candidacy:** An application for admission to candidacy which includes the total course program and other necessary documentation must be filed with the Graduate School about three months before the expected date of graduation. The specific deadlines are given in the calendar of events in this catalog.

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4. **Substitutes for the Master's Thesis:** Candidates for the MHA degree do not write a Master's Thesis; details on an approved substitute are available from the department.
 5. **Final Written or Oral Examination:** The examination or approved substitute must be taken at least one month before the degree is expected. The specific deadline is given in the calendar of events in this catalog. The focus is on work taken in the department, but it may extend to other scientific and professional areas in which the department would expect its students to be knowledgeable.
 6. **Time Limitation:** All requirements of the degree must be completed within five years from the time the student first matriculated in the program.

Master of Science

Programs of study leading to this degree are offered in the Departments of Biostatistics, Environmental Sciences and Engineering, and the Curriculum in Public Health Nursing.

For guidelines on this degree program, the reader should refer to sections on the relevant departments and curriculum, brochures produced by these programs, and the catalog of the Graduate School.

Master of Science in Environmental Engineering

The curriculum leading to this degree is designed to prepare graduates for careers in the environmental engineering profession, with special emphasis on water resources and air and industrial hygiene. Specifically, those awarded this degree are prepared for professional work with private firms of consulting engineers; with public agencies at the national, state, regional, and local levels of governments; and with a variety of industrial organizations.

Requirements for Admission

Candidates for this degree must hold an engineering degree from an institution accredited by the Accreditation Board for Engineering and Technology or from an equivalent foreign institution—preferably in civil, environmental or sanitary, chemical, or mechanical engineering—where the curriculum has involved fundamental work in chemistry, physics, mathematics, and the engineering sciences.

Requirements for the Degree

1. **Residence.** A minimum of one calendar year (12 months) of residence for students who have graduated with a strong record from approved engineering schools.
2. **Course Program.** Upon admission, students are required to develop a program of courses in consultation with their academic advisers. The program must include sufficient breadth to satisfy minimum course requirements described elsewhere in this catalog. For all students, a minimum of 30 graduate credits is required.
3. **Admission to Candidacy.** Students must file an application with the Graduate School for admission to candidacy about three months before the expected date of graduation. The specific deadlines are given in the calendar of events in this catalog.
4. **Substitutes for the Master's Thesis:** Candidates for the MPH, MSPH, and MSEE degrees who do not write a Master's Thesis must write a Master's

Paper as a substitute. The School of Public Health has specified the following guidelines for this substitute.

- a. The Master's Paper should show some synthesis of knowledge, and advance or contribute to the (appropriate specialized area of the) field of Public Health.
 - b. In connection with the Master's Paper, each candidate will register for at least three hours of credit in XXXX 392 (where XXXX is the department acronym), or some other course approved for this purpose by the School.
 - c. Each Master's Paper must be approved by at least two members of the Graduate Faculty. The candidate will submit the paper to the department, including a title page showing the approving signatures, in accordance with the University calendar.
 - d. Approved Master's Papers will be kept at least five years in a public file (usually, in the Departmental Library or Reading Room).
5. **Final Oral Examination.** About one month before the expected date of graduation, students are given a final oral examination which focuses on their program of study, including the written report. Deadlines are announced in the Department of Environmental Sciences and Engineering.
6. **Time Limitation.** All requirements for the degree must be completed within five years of the time the student matriculated in the program.

Doctor of Public Health

The Doctor of Public Health (DrPH) program provides professional training to prepare persons for the effective conduct or supervision of research, usually of an applied nature, and the integration of new knowledge and techniques into community and/or public health practice. Graduates are typically employed by operating community or public health programs at the local, state, national or international levels.

Fields of Specialization

Programs leading to the Doctor of Public Health degree are offered by the Departments of Biostatistics, Epidemiology, Health Behavior and Health Education, Health Policy and Administration, Maternal and Child Health, and Nutrition.

Requirements for Admission

A prior master's or doctoral degree in public health or a related field is generally required. However, students in MPH or MSPH programs at the School may be admitted to the DrPH program without formally acquiring the master's degree, provided they satisfy all course requirements for the MPH degree.

At least 12 months of significant experience in public health is also required, but this may be included as part of the DrPH program before formal admission to candidacy.

Requirements for the Degree

1. **Time:** A minimum of two academic years of course work and directed research, including at least two semesters of full-time continuous residence. This must be in addition to any time needed for satisfying the requirements for admission to the program. Students attempting to obtain the DrPH degree simultaneously with another Graduate School degree must register full time in the School of Public Health at least two semesters.
2. **Course Program:** A minimum of 18 semester hours of course work beyond the master's degree over and above MPH core courses are required for admis-

sion to candidacy and dissertation and research courses. The specific courses to be taken and number of credits will depend upon the qualifications and field of interest of the individual students. However, inasmuch as acquisition of this degree requires broad knowledge, students will of necessity take courses outside of their own department from within the School of Public Health, other parts of the University, or in other universities.

3. **Doctoral Committee:** Individual departments may, at the early stage of the program, establish a group of course advisers to direct and supervise the student's course work. The group may later become the dissertation committee. The doctoral student should play a significant role in selecting members of the committee.

The dissertation committee shall consist of no fewer than five members, one of whom shall be named chair, and at least three of whom shall be full members of the Graduate Faculty. Others may be limited members of the Graduate Faculty or "special appointees" approved by the Graduate School. Committee members shall be nominated by the director of the departmental doctoral program using the "Recommendation for Composition of Doctoral Dissertation Committee" form which must be transmitted via the School of Public Health's Associate Dean for Academic Programs to the Graduate School for approval. This committee will examine and approve the dissertation prospectus, either as part of the first doctoral oral examination or subsequent to it; consult with the student throughout the progress of the research; and participate in the final oral examination.

Doctoral committees and students are encouraged to include scholars from outside the program to serve as members of doctoral committees. The outside members may be selected from faculty from other departments of the University, or other institutions where scholarly work is conducted.

Each doctoral student is expected to consult with members of the dissertation committee at frequent intervals throughout the progress of his or her research and submit a progress report to each member of the committee at least once a year.

4. **Examinations:** When students have completed their course work or are in the final stage of their course programs and have satisfied other conditions for admission to candidacy, they are eligible to take the comprehensive doctoral examination. This consists of an oral and a written examination, both conducted by a committee which may or may not be the same as the dissertation committee. The interval between the two examinations should be short. The examinations are taken in the order determined by the committee and should cover all work in the student's major and minor fields of study. In addition to testing the student's knowledge, the committee may at the time of the oral examination determine the appropriateness and feasibility of the dissertation topic or hold additional examinations for this purpose at a later date.

The oral examination to examine and approve the dissertation prospectus must be conducted by at least five members of the dissertation committee, at least three of whom shall be full members of the Graduate Faculty.

If the student fails either examination he or she may not take the examination a second time until at least three months have elapsed. A student who fails either examination twice becomes ineligible to continue graduate study.

5. **Admission to Candidacy:** Prior to admission to candidacy, students must have:
 - a. Completed the 18 semester hours of course work required for the doctoral program as described above;
 - b. Passed both oral and written parts of the comprehensive examination; and

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- c. Acquired the MPH; or satisfied the School's MPH core course requirements which applied either at time of admission to the program or at the time of admission to candidacy. If students seek exemptions for any course requirements for the MPH on the grounds of equivalency of other courses taken, equivalency will be determined by the departments in the School which teach those particular courses.
 6. **Research:** Each candidate is required to submit a dissertation reflecting research of such scope, originality, and skill in presentation as to indicate that the student has a command of the subject and has demonstrated an ability to contribute fresh knowledge or perspectives on the subject. In addition, the dissertation should demonstrate mastery of the research methodology of the discipline.
 7. **Application for Degree:** When candidates approach completion of their research and can anticipate final approval of their dissertations they should apply for a degree on a particular graduation date. In the event that the degree is not received in that graduation, the student must file a new Application for Degree. Applications must be filed about three months before the time scheduled for the candidate's graduation in accordance with the deadline given in the calendar of events in this catalog.
 8. **Final Oral Examination:** The final oral examination should be primarily a defense of the dissertation and be conducted by the appointed dissertation committee. The examination should be open to the public.

This examination shall be held only after all members of the dissertation committee have had adequate opportunity to review a draft of the dissertation which the candidate is prepared to submit for final typing. The dissertation adviser is responsible to the members of the committee for determining that the draft is an appropriate form for their evaluation. The committee may, at the time of the final oral, require alterations and corrections. The dissertation adviser is also responsible for verifying that the changes required by the committee have been made, but may delegate this responsibility to those committee members who imposed the requirements. When these requirements have been met, the Report of the Final Oral Examination is submitted to the Graduate School, and the dissertation in final typed form, designed to meet the standards as defined in *A Guide to the Preparation of Theses and Dissertations*, is registered with the Graduate School.
 9. **Time Limitation:** All requirements for the degree must be completed within eight years of the time the student matriculated as a graduate student at this institution. If a student left the University at the completion of a master's program and returned later for the DrPH, he or she would be permitted eight years after admission as a doctoral student for completion of requirements. If the program is interrupted, the student has the option of satisfying the requirements which were in effect either at the time of matriculation or during the final year of work.
 10. **Leave of Absence:** A doctoral student may request and receive a leave of absence from graduate study for a definite stated time. Written requests are to be presented through the School's Associate Dean for Academic Programs to the Graduate School explaining the reasons for the leave. The request must be accompanied by a written approval from the department chair or director of the doctoral program and endorsed by the Associate Dean for Academic Programs. If the Graduate School approves the leave of absence, the time of that leave will not count against total time allowed for the degree.

Doctor of Philosophy

The Doctor of Philosophy degree prepares persons for leadership in academic and related settings involving teaching and research with emphasis on basic or theoretical issues. Graduates are typically employed by universities or other organizations conducting research.

This degree is offered in the Departments of Biostatistics, Environmental Sciences and Engineering, Epidemiology, Health Behavior and Health Education, and Health Policy and Administration. For details consult each departmental section in this catalog and *The Graduate School Catalog*.

The precursor to the PhD degree is typically the MSPH degree if the research is oriented to public health or the MS degree if the research is not so oriented.

Joint Degree Programs

Joint degree programs are offered in certain departments of the School of Public Health in conjunction with the Schools of Medicine, Dentistry, Law, Social Work and Education (special education). Medical students can select the joint degree option through the Departments of Epidemiology, Health Policy and Administration, and Maternal and Child Health. Dental and law students enroll in the Department of Health Policy and Administration. The joint degrees with the Schools of Social Work and Education are through the Department of Maternal and Child Health.

Under the joint degree arrangement, a student may be able to earn two professional degrees in a period of time less than the total required by the two degrees separately. Information on joint degree programs is available from the department in which the student is interested in enrolling.

Grades

Grades used in the evaluation of the performance of graduate students are as follows:

H	Clear Excellence
P	Entirely Satisfactory
L	Low Passing
F	Failed
S	Satisfactory

No work falling below the standard represented by the grade **L** is counted for graduate credit. If, in the judgment of the Administrative Board, the quality of work of any student falls below the standard expected of graduate students, the registration of such student will be cancelled. A graduate student becomes academically ineligible to continue in the Graduate School if he or she receives any grade of **F** or receives 9 or more hours of **L**.

If a student either completes or withdraws from one graduate program and begins study in another graduate program, those courses to be credited toward the new program will form the basis for academic eligibility.

Additional information on academic regulations are published in *The Graduate School Catalog* which can be obtained from the Graduate School Office, Bynum Hall, CB#4010.

Delta Omega

Election to the Theta Chapter of Delta Omega, public health's national honor society, occurs shortly before graduation and is based upon academic achievement and leadership potential.



Sigma Theta Tau

Election to the Alpha Alpha Chapter of Sigma Theta Tau (national honor society of nursing) occurs shortly before graduation for nurse students in the School of Public Health.

Financial Assistance

Minority Presence Grant Program

Under the Board of Governors general Minority Presence Grant Program, black students may be eligible for special financial assistance if they are residents of North Carolina, enrolled for at least three hours of degree-credit coursework, and demonstrate financial need.

The Minority Presence Grant Program for Doctoral Study provides stipends of up to \$9,000 for the academic year, with an option of additional support for study in the summer session, for black residents of North Carolina who are selected to participate. Recipients must be full-time students pursuing doctoral degrees at The University of North Carolina at Chapel Hill.

Patricia Roberts Harris Fellowships

The Patricia Roberts Harris (PRH) Fellowship Program is a federal program administered by the Department of Education which provides fellowships for the purpose of increasing the representation of minorities and women in graduate and professional education. In the School of Public Health, the Departments of Biostatistics, Environmental Sciences and Engineering and Epidemiology participate in this program. The PRH fellowship provides a stipend of up to \$10,000 for 12 months, plus tuition and fees. Continuation of the PRH Fellowship Program is contingent upon funding from the U.S. Department of Education.

Traineeships, Assistantships, & Loans

A limited number of federally sponsored “non-service” traineeships and fellowships are expected to be available to properly qualified candidates. Traineeships or fellowships will not be awarded until the student has been admitted to the School. Graduate assistantships are “service” appointments and some require a reduced load of academic work. Persons desiring consideration for service or non-service awards should so indicate by checking the appropriate box on the application for admission form.

Other work opportunities and some student loan funds are available from the University Student Aid Office. Application should be made to, Director, Office of Student Aid, CB# 2300, 300 Vance Building, Chapel Hill, N.C. 27599-2300.

Scholarships and Fellowships

Four endowed awards are available to graduate students in the School of Public Health.

Professor Ruth Warwick Hay, the first Head of the Department of Public Health Nursing, left a part of her estate in trust for a scholarship which she wished to be known as the *Margaret Blee – Ruth Warwick Hay Scholarship*. The income from the fund is awarded annually as an honorary scholarship to a student enrolled in the Curriculum of Public Health Nursing. A Scholarship Committee of faculty and students oversees the selection of the candidate who is nominated and elected by the full-time faculty and students.

An endowment, established in 1987, honors Drs. Lucy S. Morgan and Eunice N. Tyler, founders of the Department of Health Education and pioneers in the field of health education. Dr. Tyler is honored by the Tyler Practice Award and Dr. Morgan by the Lucy S. Morgan Fellowship. The latter is awarded annually to a second year master’s student in the Department of Health Behavior and Health Education. Selection is based on scholarship, integrity, and demonstrated leadership in health education.

The Cole Scholarships were established by a bequest from Miriam L. Cole, an alumna of the School of Public Health. The scholarships are open to all departments and curriculum in the School. Two awards are presented annually to master’s program applicants based on their GPA, GRE, application essay, past experience and departmental nomination. These awards provide an incentive for applicants of very high caliber to enroll in the School of Public Health.

These awards are made and the recipients recognized at appropriate occasions each year.

Student Union

All members of the School of Public Health student body are members of the Student Union. Its offices are made up of departmental representatives and a central Union Board which represents the entire student body. The Assistant Dean for Students serves as a liaison representative. The purposes of the Student Union are: (1) to enhance and ensure the opportunity of the student to receive an education of the highest attainable quality; (2) to represent and advocate causes and interests of the student body; (3) to stimulate interest in and encourage activities which relate to health in its broadest sense; and (4) to function as a channel of communication between the student body and the faculty.

Microcomputer Laboratory

The microcomputer laboratory is an educational facility operated jointly by the School of Public Health's Division of Computing and Information Services and the University's Microcomputing Support Center. It is available for general student use.

The lab has 22 Zenith 386 SX PCs, 10 Zenith 20MHz 386 PCs, and 8 Macintosh LC machines. Each PC has 3 megabytes of RAM (4 for the 10 full 386 machines), a 20 megabyte hard disk, a 3½ inch floppy disk, a math coprocessor, a mouse, and a color VGA monitor. The Macintoshes have one floppy drive, 2 megabytes of RAM, a 40 megabyte hard disk, and a color screen. All machines are Novell networked, including the Macintoshes. In addition, the machines connect to the campus broadband network and the School's VAX-based system for electronic mail.

The facility is housed in two rooms, 2307 and 2308 McGavran-Greenberg Hall. One room is equipped with a projection system for display of a computer screen. This room may be reserved by faculty for class demonstrations. When not reserved, the room is available for general student use. A student laboratory attendant is present during all operating hours and can provide general assistance and minor problem solving.

A variety of software is maintained for the IBM-type machines including Microsoft Word, Wordperfect, dBASE IV, VP-Planner and Lotus, Systat and PC-SAS. Software for the Macintoshes includes MacPaint, MacDraw, MacWrite, Microsoft Word, and Excel. Training in the use of microcomputers is available from the Microcomputing Support Center in the form of frequently scheduled short courses.

In addition, with the cooperation of the Health Sciences Library, there are 5 PC workstations dedicated to bibliographic database searching. The 5 machines, located in the southwest corner of 2308 McGavran-Greenberg, access CINAHL (nursing and allied health); HealthPlan (health administration); and MEDLINE (medical) bibliographic databases. These databases are the same as the ones located in the Health Sciences Library, and they use the SilverPlatter search interface. The database workstations also access several major university library card catalogs (called OPACS-online public access catalogs) around the country using telnet communications on the Internet.

Departments may place their own software on the server according to procedures established by the Microcomputing Support Center.



Departments and Curriculum

- Biostatistics
- Environmental Sciences and Engineering
- Epidemiology
- Health Behavior and Health Education
- Health Policy and Administration
- Maternal and Child Health
- Nutrition
- Public Health Nursing



Biostatistics

Chair

Barry H. Margolin
Professor

Registrar

Betty H. Pounders
Telephone No. (919) 966-7262

FACULTY

Professors

James R. Abernathy
Clarence E. Davis
Ronald W. Helms
David G. Kleinbaum
Gary G. Koch
Lawrence L. Kupper
Dana Quade
Pranab K. Sen, *Cary C. Boshamer*
Richard H. Shachtman
Chirayath M. Suchindran
Michael J. Symons
O. Dale Williams

Professors Emeriti

Elizabeth J. Coulter
Regina C. Elandt-Johnson
James E. Grizzle
¹Roy R. Kuebler
H. Bradley Wells

Research Professors

Richard E. Bilsborrow
John G. Fryer

Adjunct Professors

Harry A. Guess
David G. Hoel
Daniel G. Horvitz
Anders Lunde
W. Kenneth Poole
Ibrahim A. Salama
Babubhai V. Shah

Associate Professors

William D. Kalsbeek
Keith E. Muller
Craig D. Turnbull

Research Associate Professors

Shrikant I. Bangdiwala
Lloyd E. Chambless
James D. Hosking

Adjunct Associate Professors

John P. Creason
Lester R. Curtin
David M. DeLong
Edward L. Frome
Sandra B. Greene
Frank E. Harrell, Jr.
Kerry L. Lee
Judith T. Lessler
Timothy M. Morgan
Christopher Portier
Donald W. Reinfurt
Wilson B. Riggan
Clarice R. Weinberg
Takashi Yanagawa

Assistant Professors

Bahjat Qaqish
Francoise Seillier-Moiseiwitsch
Kinh N. Truong

Research Assistant Professors

Paul W. Stewart

Adjunct Assistant Professors

Ingrid A. Amara
Kerrie E. Boyle
Nguyen Dat
Deborah V. Dawson
Elizabeth R. DeLong
Joseph M. Janis
Lisa M. LaVange
Imogene McCanless
Bercedis Peterson
Basil Samara
Thomas B. Starr

Visiting Assistant Professor

Lloyd J. Edwards

Adjunct Instructors

Delton Atkinson
Priscilla A. Guild

Lecturer

Phillip N. Gallagher

¹Deceased Feb. 20, 1990.

The Department of Biostatistics offers programs of study leading to an undergraduate degree (Bachelor of Science in Public Health), two master's degrees (Master of Public Health and Master of Science), and two doctoral degrees (Doctor of Philosophy and Doctor of Public Health).

The Bachelor of Science in Public Health (BSPH) program seeks to prepare students for entry-level statistical positions in health and related organizations, as well as for graduate training. Information about admission and course requirements for this degree is available on page 17 of this catalog and in *The Undergraduate Bulletin* of the University.

The Master of Public Health (MPH) degree program is designed to prepare individuals for positions that require knowledge of the broad field of public health as well as specialized knowledge of biostatistics. The Master of Science (MS) degree program is designed to provide graduate training in both the theory and methods of biostatistics, as applied to public health problems, and to prepare students for doctoral programs in biostatistics.

The Doctor of Philosophy (PhD) degree program is designed to provide advanced, research-oriented training in theory and methodology and to prepare individuals especially for academic careers and research positions in the government or elsewhere. The Doctor of Public Health (DrPH) degree program emphasizes professional training aimed at preparing students for leadership positions in the general areas of applied research related to health problems and delivery of technical statistical services in the health field. To meet these objectives, the program is designed to equip students with a thorough knowledge of the technical aspects of the application of statistical techniques to a range of health problems, and a basic knowledge of an applied area of public health.

Graduate admissions are usually made initially for study toward a master's degree. Time requirements to obtain the degrees are typically 12 to 18 months for the MPH, two academic years for the MS, and approximately three years for the doctoral degrees.



Biostatisticians apply their quantitative knowledge to a variety of special fields related to the health of the people—such as the physical environment, the size and characteristics of the population, patterns of disease and disability, and health service utilization and costs. In recognition of these different applications, the Department provides for specialty options within biostatistics such as: biometry, cardiovascular diseases, data management, demography and population studies, environmental biostatistics, health services, and mental health statistics.

Further information about the Biostatistics training programs and requirements for admission are available in brochures which can be obtained by writing to the Department of Biostatistics, CB# 7400, School of Public Health, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599-7400.

Department of Biostatistics

- BIOS 97 Readings in Biostatistics (1–3).** Directed readings or laboratory study. May be taken more than once. Two to six laboratory hours a week. Staff.
- BIOS 99 Honors Research in Biostatistics (3).** Prerequisite, BIOS 97. Directed research. Written and oral reports required. *Fall, spring and summer.* Staff.
- BIOS 101 Fundamentals of Biostatistics (3)** Introduction to procedures in collection, summarization, analysis, and presentation of data. Topics include sampling, experimentation, measurement, descriptive statistics, probability, confidence intervals, and tests of hypotheses. *Fall and summer.* Quade.
- BIOS 106 Mathematical Methods in Biostatistics (1).** Prerequisite, MATH 32. Calculus and special mathematical techniques necessary for biostatistics. *Summer.* Staff.
- BIOS 107 Matrix Theory in Biostatistics (1).** Prerequisite, MATH 32. Review of matrix theory results useful in statistics. *Summer.* Stewart.
- BIOS 110 Principles of Statistical Inference (3).** Prerequisite, permission of the instructor required except for majors in School of Public Health who have knowledge of basic descriptive statistics. Major topics include elementary probability theory, probability distributions, estimation, tests of hypotheses, chi-squared procedures, regression, and correlation. *Fall and spring.* Turnbull.
- BIOS 111 Introduction to Statistical Computing and Data Management (3).** Prerequisite, BIOS 101 or equivalent, and permission of instructor (Except for majors in the School of Public Health). Introduction to use of computers to process and analyze data, components of digital computers, characteristics of magnetic storage devices, use of JCL and utility programs, concepts and techniques of research data management, use of statistical program packages and interpretation. *Fall and spring.* Gallagher.
- BIOS 120 Special Techniques in Biometry (1–3).** Special topics of current interest in biometry. *Fall, spring and summer.* Staff.
- BIOS 124 Some Quantitative Methods in Planning and Evaluation (HPAA 144) (3).** Prerequisite, BIOS 101 or equivalent or permission of instructor. Planning cycle, methods overview, data sources, PERT, budgeting, health indices, measurement of goal fulfillment, achievement, effectiveness, efficiency, research designs, benefit cost analysis, decision analysis, probability utility, and decision trees. *Spring.* Staff.
- BIOS 130 Research Issues in Mental Health Statistics (3).** Prerequisites, BIOS 110 and EPID 160, or permission of instructor. Concepts of measurement, history, and current status of classification schemata for mental disorders, methods of data analysis, and research designs. *Spring.* Turnbull.

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- BIOS 135** **Probability and Statistics (4)**. Prerequisite, MATH 32 or equivalent. Elements of descriptive statistics; basics of probability; random variables and their probability distributions; special distributions, including the binomial, Poisson, normal, gamma; expectation and moments; linear combinations of random variables. Elements of estimation and hypothesis testing; analysis of variance; multiple regression, analysis of categorical data, some nonparametric methods. Particular attention is given to the statistical treatment of environmental science and engineering problems. *Fall*. Symons.
- BIOS 140** **Problems in Biostatistics (1 or more)**. Prerequisites to be arranged with the faculty in each case. A course for students of public health who wish to make a study of some special problem in the statistics of the life sciences and public health. *Fall, spring and summer*. Staff.
- BIOS 145** **Principles of Experimental Analysis (3)**. Prerequisite, Biostatistics 110 or 135 or equivalent and permission of instructor except for majors in School of Public Health. Continuation of Biostatistics 110; the analysis of experimental and observational data, including multiple regression, and analysis of variance and covariance. *Fall and spring*. Staff.
- BIOS 150** **Elements of Probability and Statistical Inference I (GNET 150) (3)**. Prerequisite, MATH 32 or equivalent. Fundamentals of probability theory; discrete and continuous distributions; functions of random variables; fundamentals of statistical inference, including estimation and hypothesis testing. *Fall*. Shachtman.
- BIOS 160** **Probability and Statistical Inference I (3)**. Prerequisite, MATH 33 or equivalent. Introduction to probability; discrete and continuous random variables; expectation theory; bivariate and multivariate distribution theory; regression and correlation; linear functions of random variables; theory of sampling; introduction to estimation and hypothesis testing. *Fall*. Kupper.
- BIOS 161** **Probability and Statistical Inference II (3)**. Prerequisite, BIOS 160. Distribution of functions of random variables; central limit theorem; estimation theory; maximum likelihood methods; hypothesis testing; power, Neyman-Pearson Theorem, likelihood ratio tests, non-central distributions. *Spring*. Kupper.
- BIOS 162** **Introductory Applied Statistics (3)**. Prerequisites, BIOS 111 and 150 or equivalents. Approaches to problems of description, and goodness of fit, univariate location and scale, bivariate independence and correlation, and comparison of independent or matched samples, involving categorical, discrete, normal, or ranked data. *Spring*. Quade.
- BIOS 163** **Intermediate Linear Models (3)**. Prerequisites, BIOS 107 or MATH 147, BIOS 111, 145, 150, or equivalents. Regression analysis in matrix terms, general linear hypothesis, diagnostics, model building. One- and two-day ANOVA with fixed or random effects. Power; algorithms; analysis of covariance. *Fall*. Muller.
- BIOS 164** **Sample Survey Methodology (STAT 104) (3)**. Prerequisite, BIOS 150 or equivalent or permission of instructor. Fundamental principles and methods associated with survey sampling, giving primary attention to as non-mathematical as possible a treatment of simple random sampling, stratified sampling, and cluster sampling. Also, techniques of questionnaire design, the problems of nonresponse, and sources of non-sampling errors. Practical experience in the applied aspects of sampling is provided by student participation in the design, execution, and analysis of an actual survey. *Spring*. Kalsbeek.
- BIOS 165** **Analysis of Categorical Data (3)**. Prerequisites, BIOS 145, 150, and 162 or permission of instructor. Introduction to the analysis of categorized data: rates, ratios, and proportions; relative risk and odds ratios; Cochran-Mantel-
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- Haenszel procedure; survivorship and life table methods; linear models for categorical data. Applications in demography, epidemiology, and medicine. *Fall*. Koch.
- BIOS 166 Applied Multivariate Analysis (STAT 160) (3).** Prerequisite, BIOS 163 or equivalent. Application of multivariate techniques, with emphasis on the use of computer programs. Multivariate analysis of variance, multivariate multiple regression, weighted least squares, principal component analysis, canonical correlation and related techniques. *Spring*. Muller.
- BIOS 167 Applied Stochastic Processes (ORSA 167) (3).** Prerequisite, BIOS 161 or equivalent. Markov chains, Poisson processes and extensions, epidemic models, branching processes and other stochastic models of empirical processes. Disease, population, and other biostatistical applications. *Fall and Spring*. Sen.
- BIOS 168 Design of Public Health Studies (3).** Prerequisites, BIOS 145, 150 or equivalents. Statistical concepts in basic Public Health study designs: cross-sectional, case-control, prospective and experimental (including clinical trials). Validity, measurement of response, sample size determination, matching and random allocation methods. *Summer*. Davis.
- BIOS 170 Demographic Techniques I (3).** Prerequisite: BIOS 101 or equivalent. Source and interpretation of demographic data; rates and ratios, standardization, complete and abridged life tables; estimation and projections of fertility, mortality, migration, and population composition. *Fall*. Suchindran, Bilsborrow.
- BIOS 180 Introductory Survivorship Analysis (3).** Prerequisite, BIOS 161 or permission of instructor. Introduction to concepts and techniques used in the analysis of time to event data, including censoring, hazard rates, estimation of survival curves, regression techniques, applications to clinical trials. *Spring*. Staff.
- BIOS 191 Field Observations in Biostatistics (1).** Field visits to, and evaluation of, major nonacademic biostatistical programs in the Research Triangle area. Field Fee \$25.00. *Fall*. Turnbull.
- BIOS 213 Data Management in Biostatistics (3).** Prerequisite, BIOS 111 or equivalent. Techniques for designing, implementing, and operating computerized data management systems for large studies with particular emphasis on collaborative medical studies. Experience in programming in a procedural language (PL-1, FORTRAN, C, BASIC, etc.) is assumed. *Spring and Summer*. Hosking.
- BIOS 215 Health Data Processing Laboratory (1-3).** Prerequisite, BIOS 213. A laboratory course for students who wish to gain experience in the data processing aspects of current projects and collaborative medical studies of the Department. *Two or more hours a week, fall, spring, and summer*. Hosking.
- BIOS 240 Specialized Methods in Health Statistics (1 or more).** Prerequisite, permission of the instructor. Statistical theory applied to a special program area of timely importance in the life sciences and public health. Lectures, seminars and/or laboratory work, according to the nature of the special area under study. *Fall, spring, and summer*. Staff.
- BIOS 250 Advanced Techniques in Biometry (1-4).** Prerequisites, BIOS 161, 163 or equivalents. Permission of instructor. Up to three or four separate one semester hour modules presenting advanced techniques in biometry (topics covered usually vary at each offering). A knowledge of elementary computer programming is assumed. *Summer*. Staff.
- BIOS 256 Introduction to Nonparametric Statistics (STAT 171) (3).** Prerequisite, BIOS 161 or equivalent. Theory and application of nonparametric methods for various

problems in statistical analysis. Includes procedures based on randomization, ranks and U-statistics. A knowledge of elementary computer programming is assumed. *Fall*. Bangdiwala.

- BIOS 257 Nonparametric Procedures in Biometric Research (3).** Prerequisite, BIOS 256 or equivalent. Nonparametric point and interval estimation in linear models useful in biometric research. Robust procedures, including those based on ranks, for analyzing designed experiments, bioassays, and clinical trials. *Spring*. Sen.
- BIOS 259 Applied Time Series Analysis (3).** Prerequisites, BIOS 161 and 163 or equivalents. Permission of instructor required. Topics include correlograms, periodograms, fast Fourier transforms, power spectra, cross-spectra, coherences ARMA and transfer models, spectral-domain regression. Real and simulated data sets will be discussed and analyzed using popular computer software packages. *Spring*. Truong.
- BIOS 260 Large Sample Theory (3).** Prerequisite, BIOS 161, corequisite, MATH 121. Stochastic convergence, probability inequalities, empirical distributions, order statistics, central limit theorems, large sample theory of statistical tests and estimates, categorical data models. *Fall*. Sen.
- BIOS 263 Advanced Linear Model Theory (3).** Prerequisites, BIOS 161, 163, MATH 147, MATH 116 or 137. Multivariate normal and related distributions; theory of estimation and statistical inference for multivariate linear models. *Spring*. Stewart.
- BIOS 264 Advanced Survey Sampling Methods (3).** Prerequisite, BIOS 164 or equivalent. Continuation of BIOS 164 for advanced students; stratification, special designs, multistage sampling, cost studies, nonsampling errors, complex survey designs, employing auxiliary information, and other miscellaneous topics. Alternate years. *Fall*. Kalsbeek.
- BIOS 265 Linear Models in Categorical Data Analysis (3).** Prerequisite, BIOS 161, 163, 165 and 166 or equivalent. Theory of statistical methods for analyzing categorical data by means of linear models, multifactor and multiresponse situations; interpretation of interactions. *Spring*. Koch.
- BIOS 266 Advanced Linear Model Methods (3).** Corequisite, BIOS 263. Analysis of multivariate linear models, including regression, MANOVA, and mixed models, and introduction to modeling covariance matrices. *Spring*. Helms.
- BIOS 267 Linear Models II (4).** Prerequisite, BIOS 263, 266, and/or equivalents. Principal components, discriminant functions, canonical variates, repeated measurements experiments, analysis of longitudinal data, components of variance. *Spring*. Truong.
- BIOS 271 Demographic Techniques II (3).** Prerequisites, BIOS 170 and integral calculus. Life table techniques; methods of analysis when data are deficient; population projection methods; interrelations among demographic variables; migration analysis; uses of population models. *Spring*. Suchindran.
- BIOS 277 Mathematical Models in Demography (3).** Prerequisite, permission of the instructor. A detailed presentation of natality models, including necessary mathematical methods, and applications; deterministic and stochastic models for population growth, migration, etc. Alternate years. *Spring*. Suchindran.
- BIOS 280 Theory and Methods for Survival Analysis (3).** Prerequisite, BIOS 180 or permission of instructor. Continuation of BIOS 180 with detailed discussion of semiparametric likelihoods, time dependent covariates, robustness and tests of assumptions, covariate adjustment, and multivariate analysis. *Fall*. Staff.

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- BIOS 281 Statistical Methods in Human Genetics (GNET 281) (3).** Prerequisite BIOS 161 or permission of instructor. An introduction to statistical procedures in genetics, Hardy-Weinberg equilibrium, linkage disequilibrium, segregation analysis, linkage analysis methods (including usage of genetics software packages), and analysis of molecular genetic data. (1991 and alternate years.) *Spring.* Staff.
- BIOS 341 Principles of Statistical Consulting (1).** BIOS 145 or equivalent. Permission required except for BIOS majors. An introduction to the statistical consulting process, emphasizing its non-technical aspects. *Fall and spring.* Symons.
- BIOS 342 Practice in Statistical Consulting (1-3).** Prerequisites BIOS 111, 145, 150, 341 or equivalents, permission of the instructor. Under supervision of a faculty member, the student interacts with research workers in the health sciences, learning to abstract the statistical aspects of substantive problems, to provide appropriate technical assistance, and to communicate statistical results. *Fall, spring, and summer.* Staff.
- BIOS 350 Training in Statistical Teaching in the Health Sciences (2 or more).** Prerequisite, a minimum of one year of graduate work in statistics. Principles of statistical pedagogy. Students are responsible for assistance in teaching elementary statistics to students in the health sciences. Students work under the supervision of the faculty with whom they have regular discussions of methods, content, and evaluation of performance. *Fall, spring and summer.* Staff.
- BIOS 389 Research Seminar in Biostatistics (1-3).** Prerequisite, permission of the instructor. Seminar on new research developments in selected biostatistical topics. *Fall and spring.* Staff.
- BIOS 390 Research in Biostatistics (2 or more).** Individual arrangements may be made by the advanced students to spend part or all of his/her time in supervised investigation of selected problems in statistics. *Fall, spring and summer.* Staff.
- BIOS 392 Master's Paper (1-3).** *Fall, spring, and summer.* Staff.
- BIOS 393 Master's Thesis (0-6).** *Fall, spring, and summer.* Staff.
- BIOS 394 Doctoral Dissertation (0-9).** *Fall, spring, and summer.* Staff.
- BIOS 400 General Registration (0)**



Environmental Sciences And Engineering

Chair

William H. Glaze
Professor

Registrar

C.L. Lassiter
Telephone No. (919) 966-3844

The Department of Environmental Sciences and Engineering is the nation's oldest and largest program offering research based education in environmental science and policy. The Department offers degrees in five academic programs: Air, Radiation and Industrial Hygiene; Aquatic and Atmospheric Sciences; Environmental Health Sciences; Environmental Management and Policy; and Water Resources Engineering. The reader is directed to the description of program area content, faculty research interests, and career opportunities.

The Master of Science, Master of Science in Public Health, and Master of Public Health degrees are offered in each area. The general University and School of Public Health requirements for these degrees are listed on pages 20–25. A bachelor's degree with a major in engineering or science, usually chemistry, biology, or physics, is a requirement for admission except in the Environmental Management and Policy area where an undergraduate degree in a relevant social science is appropriate if the student also has a solid academic preparation in natural sciences and mathematics. Course work assumes that applicants have successfully completed science or engineering courses including physics, chemistry, biology, and calculus. The Master of Science in Environmental Engineering degree is offered by the programs in Air, Radiation and Industrial Hygiene and Water Resources Engineering. See page 25 for admission and degree requirements. Candidates for this degree must hold an engineering degree from an institution accredited by the Accreditation Board for Engineering and Technology or an equivalent foreign institution. Backgrounds in civil, environmental, sanitary, chemical, or mechanical engineering, where the curriculum has involved fundamental work in chemistry, physics, mathematics, and the engineering sciences, are preferred. One and two year programs are offered in each area.

General departmental courses are offered in **Sources, Transport, and Fate of Environmentally Important Materials, Health and Ecological Effects of Environmental Agents, and Environmental Management and Policy**. These courses are formulated to represent the intellectual core of Environmental Sciences and Engineering.

The Doctor of Philosophy is offered in each of the programs. In general, applicants without master's degrees are required to pursue the PhD via a master's degree. Direct admission to the PhD program may be possible for the exceptional student. Four semesters of full-time graduate study, at least two of which must be earned in continuous registration on this campus, are necessary. Based upon past experience actual residence time may be considered a minimum of two years following a master's degree, with a median of three and one-half years.

Other PhD requirements include a major in one of the program areas and a supporting program or minor of at least 15 semester hours, excluding seminar and research units, selected to be of maximum benefit in the conduct of the research and preparation of the dissertation. Thus, course programs leading to the PhD are too individualized to permit illustration. However, knowledge in the three areas

reflected in the general departmental courses is required of all PhD students. The Department and the University require knowledge of a research skill or foreign language for the PhD degree. Doctoral written and oral examinations are customarily given upon completion of course work and prior to approval of a research proposal for the dissertation. The defense of the dissertation is the final oral examination for the doctorate. Interdisciplinary studies are encouraged and coordinated by organizations within the University, such as the Institute for Environmental Studies, the Water Resources Research Institute, and the Institute of Marine Sciences. Joint programs of study, such as the speciality in radiological hygiene offered with North Carolina State University in Raleigh, draw on the specific resources of each group with students developing their major interest depending on their training in basic disciplines.

Courses offered by the Department of Environmental Sciences and Engineering are described on pages 51-62 of this catalog. Courses may be taken at Duke University and at North Carolina State University without payment of additional tuition.

The Department has informational brochures for each program area and publishes a quarterly "ESE Notes," which are available on request.

Air, Radiation and Industrial Hygiene

Professors

David H. Leith

Program Area Director

Edward L. Chaney

Donald L. Fox

Harvey E. Jeffries

R. Eugene Johnston

Stephen M. Rappaport

Parker C. Reist

Carl M. Shy

James E. Watson, Jr.

Research Professor

Richard M. Kamens

Adjunct Professors

Warren A. Cook

Merril Eisenbud

David Ensor

John C. Lumsden

Ted B. Martonen

Professor Emeritus

Arthur C. Stern

Associate Professors

Douglas J. Crawford-Brown

Donald G. Willhoit

Research Associate Professor Emeritus

John L.S. Hickey

Adjunct Associate Professors

John M. Dement

Philip E. Hamrick

James A. Oppold

Madhav B. Ranade

Donald A. Tyndall

Assistant Professors

Michael R. Flynn

Lori A. Todd

Adjunct Assistant Professors

Woodhall Stopford

David B. Washburn

Russell W. Wiener

Adjunct Instructor

Bobby M. Wilson

The objective of the program in Air, Radiation and Industrial Hygiene (ARIH) is to provide graduate education for students who wish to pursue careers in air pollution control, radiation protection, and industrial hygiene. Students in the ARIH program select one of the three tracks for specialization. All are areas of preventive public health in which the professional recognizes and evaluates a problem, considers alternative control measures, and weighs the cost of control against the long-term cost of inaction.

Air pollution control is concerned with pollutants released into the atmosphere. Important considerations include the sources of these pollutants, engineering

methods for their control, their transport and chemical transformations in the atmosphere, and their effects on human health and the environment.

The radiation protection program is concerned with the interaction of radiation with physical and biological systems. Based on study of the mechanisms of radiation damage and of radiation standards, the health physicist develops procedures to evaluate radiation hazards and ensure the protection of humans and their environment.

Industrial hygiene is concerned with the recognition, evaluation, and control of environmental factors in the workplace that cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or citizens of the community.

Career opportunities in this field are excellent. Graduates find employment with industry, consulting firms, universities or research laboratories, and with state and federal agencies such as the Environmental Protection Agency, the Nuclear Regulatory Commission, the Department of Energy, and the National Institute for Occupational Safety and Health.

Those wishing to enroll in this program must have an academic background that included adequate preparation in calculus, chemistry, and physics. Master's programs generally take 1½ to 2 years; the PhD takes an additional three or more years beyond the master's degree. Those seeking the PhD degree almost always must earn a master's degree first, either at UNC or elsewhere.

The following courses are required of all master's students in air, radiation and industrial hygiene: **Biostatistics** (BIOS 110 or 135), **Epidemiology** (EPID 160), **Air and Industrial Hygiene** (ENVR 141), **Introduction to Aerosol Science** (ENVR 145), and **Master's Technical Report** (ENVR 392).

For master's students in air pollution control, the following courses are also required: **Health and Ecological Effects of Environmental Agents** (ENVR 191), **Air Pollution Meteorology** (offered at North Carolina State University), **Air Pollution Control** (ENVR 245), **Measurement of Ozone and Oxides of Nitrogen in Air** (ENVR 364), **Measurement of Volatile Organic Compounds in Air** (ENVR 365), and **Measurement of Gas-Particle Interactions** (ENVR 366).

Additional course requirements for those master's students in radiation protection include: **Radiation Physics and Instrumentation** (ENVR 163), **Comprehensive Radiation Biology** (ENVR 168), **Radiation Hazards Evaluation** (ENVR 263), and **Seminar in Environmental Health** (ENVR 311).

Additional course requirements for master's students in industrial hygiene are: **Health Effects of Environmental Agents** (ENVR 143), **Industrial Ventilation Design and Lab** (ENVR 241, ENVR 241L), **Industrial Hygiene Practice** (ENVR 242), **Industrial Hygiene Laboratory** (ENVR 244), and **Radiation Hazards Evaluation** (ENVR 263).

Students earning the MSEE degree must take both **Industrial Ventilation Design and Lab** (ENVR 241, ENVR 241L) and **Air Pollution Control** (ENVR 245).

Students in the PhD program take the course work decided upon by the student and his or her committee, in accord with Graduate School requirements.

Elective courses taught by program faculty include: **Industrial Toxicology** (ENVR 144), **Aerosol Sciences Laboratory** (ENVR 145L), **Occupational Safety** (ENVR 174), **Health Hazards of Industrial Operations** (ENVR 149), and courses related to atmospheric chemistry, air pollution modeling, and global climate issues listed under the Aquatic and Atmospheric Sciences Program. Additional, elective courses taught by faculty outside the ARIH Program but appropriate for ARIH students include **Sources, Transport, and Fate of Environmentally Important Materials** (ENVR 133), **Environmental Management and Policy** (ENVR 153), **Natural Resource and Environmental Law** (ENVR 283), and other relevant courses within the Department, within the University, at North Carolina State University or at Duke University.



Aquatic and Atmospheric Sciences

Professors

Edward J. Kuenzler,
Program Area Director
Russell F. Christman
Donald L. Fox
William H. Glaze
Harvey E. Jeffries
Frederic K. Pfaender
Parker C. Reist
Mark S. Shuman
Phillip C. Singer

Professors Emeriti

J. Donald Johnson
Charles M. Weiss

Adjunct Professors

Hans W. Paerl
William E. Wilson, Jr.

Research Professor

Richard M. Kamens

Adjunct Associate Professors

Phillip W. Albro
J. Ronald Hass
David S. Millington

Assistant Professor

Michael D. Aitken

Research Assistant Professor

M. Judith Charles

Adjunct Assistant Professor

Daniel L. Norwood

Lecturer

Donald E. Francisco

Specific disciplines represented within the faculty include analytical, organic, physical, and atmospheric chemistry, biochemistry, ecology, limnology, and microbiology. Teaching responsibilities and research areas of the faculty are presented elsewhere. The program has close working relationships with the Department of Chemistry, the Department of Geography, the Curriculum in Marine Sciences, and the Curriculum in Ecology. Our students may take courses at Duke University and North Carolina State University. They may enlist appropriate faculty from these curricula to serve on their graduate committees. They may also interact with many scientists at Research Triangle Park.

Aquatic and Atmospheric Sciences (AAS) provides research-based graduate education focused on sources, transport, and transformation of natural and anthropogenic materials in stressed and unstressed multimedia environments. Study of mechanisms that control environmental processes is emphasized, but experimental and perturbed ecosystems and remediation practices are also considered. The program covers a broad range of environmental topics, extending from subcellular processes to ecosystem- and global-level processes, including the modeling of transport and transformation of aquatic and atmospheric pollutants.

This program aims to provide students with theoretical, observational, and experimental knowledge concerning processing of environmentally important materials. Emphasis is on materials resulting from human activities which adversely affect the natural environment. The scope includes identification of sources and chemical species, examination of modes and rates of transport, and analysis of types and rates of transformations, magnitudes of effects, and ultimate fates. Students are expected to gain an understanding of how changes and disturbances in terrestrial, aquatic, and atmospheric systems affect the atmosphere and hydrosphere, feedback processes, ecosystem structure and functioning, and human well-being. The program offers courses which explore physical, chemical, and biological processes in the aquatic environment and physical and chemical processes in the atmosphere which control routes and rates of materials cycling in the modern world.

The AAS program seeks a broad regional and global perspective by interrelating aquatic and atmospheric processes in course work and in research projects. However, because much current research has more restricted goals, students usually develop a specialty within their course work and their thesis research. Accordingly, three tracks within the program area are recognized, an Aquatic Chemistry track, an Atmospheric Chemistry track, and an Aquatic Biology and Ecology track.

Applicants to this program are expected to have a strong undergraduate science degree, including a year of calculus and one or more courses in physics, chemistry, and biology. Applicants planning to enter the aquatic or atmospheric chemistry track are expected to have taken physical chemistry; those entering the biology and ecology track should have academic preparation in ecology. Undergraduate courses in geology, soil science, limnology, oceanography, meteorology, modeling, or computer science are desirable. Exceptionally well-qualified students lacking strong chemistry or biology backgrounds are encouraged to apply; deficiencies in course work should be made up during the first year.

Graduate degrees are offered at the master's (MSPH and MS) and doctoral (PhD) levels. The Master of Science in Public Health (MSPH), a professional degree granted by the School of Public Health, requires completion of one course each in epidemiology and biostatistics. The student will also take two Departmental core courses (**Health and Ecological Effects of Environmental Agents; Environmental Management and Policy**) and both of the AAS core courses (**Aquatic and Atmospheric Chemical Processes and Mechanisms; Biological and Ecological Processes and Mechanisms**). Elective courses will be selected to satisfy educational needs of the particular student. A written technical report based on original laboratory, field, or modeling research, conducted under the supervision of the faculty research

adviser, is required. Students spend about a third of their time completing the research project. An MSPH degree may take two or more years, depending upon the student's interests, background, ability, and availability of financial support. Research assistants are limited to a course load of nine hours per semester.

The MS and PhD degrees are granted by the UNC Graduate School; accordingly all Graduate School requirements for these degrees must be met. Students working toward these degrees must have graduate committees to approve the course of study, administer examinations, approve the research project, and evaluate the thesis or dissertation. Students seeking the MS degree must take both of the ESE and AAS core courses as listed for the MSPH degree above. Statistical competence will be attained through Biostatistics or other courses. Expectations for the MS thesis are similar to those for the MSPH report, as outlined above. PhD students are expected to have a depth of knowledge in all ESE and AAS core course material, such depth being brought from previous educational or professional experience or attained here. The PhD degree is heavily research oriented and the dissertation must constitute a significant, original contribution to knowledge. Formal courses are selected by the student for approval by his/her PhD committee to meet both the needs of the research program and the particular needs of the student. The doctoral degree normally requires three or more years past the master's degree to complete Graduate School and departmental requirements. Many candidates work half time as research assistants on funded research projects.

This program prepares students for careers in the sciences of water resources, limnology, aquatic ecology, environmental chemistry (aquatic and atmospheric), environmental microbiology, atmospheric modeling, and pollution control. Master's degree graduates are employed with local, national, and international agencies and governments, consulting engineers, and industry. They serve as environmental managers, directors of field and laboratory research projects, and as members of teams in water resources management and process development. PhD graduates hold positions on the faculties of many colleges and major universities in biology, public health, and environmental engineering programs; as environmental managers and directors of major environmental programs in local, national, and international agencies; and as research scientists and senior environmental staff members in industry, consulting firms, and governmental agencies.

Representative courses which satisfy core and track requirements: Core—ENVR 121, ENVR 131, ENVR 143, ENVR 153; Epidemiology—EPID 160; Biostatistics—BIOS 110, 135, 145; Aquatic Chemistry Track—ENVR 122, ENVR 123, ENVR 124, ENVR 128, ENVR 225, ENVR 321, ENVR 322, ENVR 323, ENVR 324, ENVR 325, ENVR 326, ENVR 327; Biology and Ecology Track—ENVR 122, ENVR 124, ENVR 127, ENVR 132, ENVR 134, ENVR 135, ENVR 137, ENVR 231, ENVR 238, ENVR 331, ENVR 332, ENVR 334, ENVR 337; Atmospheric Chemistry Track—ENVR 145, ENVR 145L; ENVR 361, ENVR 362, ENVR 363, ENVR 364, ENVR 365, ENVR 366, ENVR 367, ENVR 368, ENVR 369; MEA 556 (NCSU-R); Special Topics, Research, and Seminar—ENVR 222, ENVR 232, ENVR 320, ENVR 330, ENVR 333.

Environmental Health Sciences

Professors

Mark D. Sobsey,
Program Area Director
Avram Gold
Stephen M. Rappaport
Carl M. Shy
James A. Swenberg

Adjunct Professor

Linda S. Birnbaum

Associate Professors

Douglas J. Crawford-Brown
Thomas R. Skopek

Adjunct Associate Professors

Larry D. Claxton
David M. DeMarini

Assistant Professor

Louise M. Ball

The Environmental Health Sciences (EHS) curriculum is designed to provide students with a research-oriented graduate education that is focused on the predictive and mechanistic understanding of the interactions of environmental agents, including pollutants, with biological systems at the molecular, cellular, organism, population and community levels. The curriculum is intended to supply the knowledge base and methodologies necessary for understanding the adverse effects of environmental agents on biological systems and for prediction of the magnitude of risk, thereby establishing a rational basis for the control of environmental exposures.

The curriculum emphasizes the following topics at both fundamental and advanced levels: (1) identification of and sources of exposure to environmental agents, with emphasis on chemicals, infectious agents and radiation; (2) the interactions of these agents with biological systems, including routes of entry, patterns of distribution, metabolism, elimination, and other activities, especially adverse effects on humans and other exposed organisms; (3) the mechanisms of adverse effects of environmental agents on biological systems; (4) measurements of biological end points, especially dosimetry of adverse effects; and (5) the development of mathematical models for prediction of adverse effects on biological systems.

The EHS curriculum is organized around four primary courses: **Health Effects of Environmental Agents; Techniques in Environmental Health Effects; Sources, Transport and Fate of Environmental Materials; and Environmental Management and Policy.** These "core" courses are followed by more advanced courses emphasizing either "Environmental Toxicology," "Infectious Agents and Human Health" or other curriculum specialties selected by the students with their adviser(s) according to the student's interests and long term goals. In addition to Departmental courses, students are encouraged to consider relevant courses offered elsewhere in the University and at other nearby universities.

As required by the Graduate School, candidates for the master's degree must complete 30 credits, including at least 24 semester hours of course work and three hours of thesis or thesis equivalent. Course requirements for the PhD degree are selected by the student and his or her doctoral committee and must include at least 3 credit hours of doctoral dissertation and 15 credit hours of a supporting program. Students pursuing the Master of Public Health or Master of Science in Public Health degrees must meet the course work and other academic requirements of the School of Public Health (and the Council on Education in Public Health), including at least one course each in Biostatistics and Epidemiology (and for MPH students one course in a field relevant to health services delivery systems). Students working toward the PhD degree and either of the Master of Science Degree options (MS or MSPH) must engage in a substantive research effort culminating in the

production of a doctoral dissertation or master's thesis (or master's technical report), respectively. MS, MSPH and MPH students must take at least 5, 3 and 2 advanced courses, respectively, in their curriculum specialty. In order to meet Graduate School requirements, PhD and MS students must have their academic programs, including courses, research topics, dissertation or thesis, and examinations approved by their selected graduate faculty committee.

Incoming students must have a sound background in mathematics (including one year of calculus) and the basic sciences, including chemistry (at least one year through organic), biology (at least one year), physics (at least one semester), and biochemistry (at least one semester). These requirements can be met through formal college-level courses or equivalent work knowledge and experience. Applicants who are otherwise highly qualified but lack this background are encouraged to apply with the understanding that they will have to make up these course deficiencies by successful (C grade or better) completion of undergraduate or graduate courses during their first year of matriculation. Admission to the PhD program typically requires a previously earned master's degree or equivalent in an appropriate field, but exceptionally qualified students having a strong undergraduate degree will be considered for admission directly into the PhD program.

Environmental Management and Policy

Professors

Richard N.L. Andrews,
Program Area Director
Donald L. Fox
Milton S. Heath, Jr.
Donald T. Lauria
David H. Moreau
Morris A. Shiffman
Alvis G. Turner, Jr.

Professor Emeritus

Emil T. Chanlett

Associate Professor

Douglas J. Crawford-Brown

Research Associate Professor

Frances M. Lynn

Adjunct Associate Professors

Michael A. Berry
Linda W. Little

Assistant Professor

Deborah A. L. Amaral

Adjunct Assistant Professor

Dennis F. Naugle

Environmental Management and Policy (EMP) involves the identification and selection of courses of action that may be taken to protect human health and the environment. Such actions range from local decisions, such as how to manage waste materials and energy and where to site new facilities, to state and federal regulatory decisions and national and global strategies for managing broad patterns of human activities — resource extraction, deforestation and urbanization, use of toxic chemicals, emissions of air and water pollutants, and others — that can harm environmental processes and human health.

The goal of the EMP program is to prepare students for professional careers in which they must recommend, choose, and implement environmental protection policies and management decisions. Such careers require a clear understanding of relevant scientific and technical questions; but equally, they require strong grounding in the economic, legal, behavioral, and political considerations that are also involved, and the ability to make complex decisions under conditions of scientific uncertainty and political value conflict.

All applicants are expected to have basic academic preparation in the natural sciences, normally including chemistry and biology, and mathematics through

calculus. At least one prior course in economics is also desirable. Most successful applicants hold a prior bachelor's degree in either a natural or social science or engineering; a strong combination of natural sciences with public policy, economics, or other behavioral sciences is especially appropriate. However, exceptionally well qualified students from any relevant field are encouraged to apply. If their academic preparation does not meet all these requirements, they may be admitted on evidence of especially strong ability or experience with the condition that deficiencies be made up during their first year.

At the master's level, all EMP students are expected to complete a core curriculum providing them with a common body of basic knowledge, principles, and methods for environmental management and policy. Beyond this core, each student is given great flexibility to develop more specialized expertise, either in particular applications (such as air or water quality management, or solid and hazardous waste management), or in methodological skills (such as risk assessment, benefit-cost analysis, quantitative decision analysis, or policy evaluation). The master's degree normally requires two years to complete, and the doctorate an additional two to three years.

Students pursuing the professional master's degree (MSPH) in EMP are expected to complete a core curriculum, a concentration on a particular application or methodology (for instance, waste management or risk assessment) developed individually in consultation with their faculty adviser, and a professional-quality master's technical report. Required core courses include ENVR 153, **Environmental Management and Policy**; ENVR 257, **Current Applications in Environmental Management**; ENVR 282, **Public Investment Theory and Techniques**; and at least two science courses in areas appropriate to the student's chosen application. The School of Public Health also requires that each MSPH student take at least one course each in epidemiology and biostatistics (normally EPID 160 and BIOS 135 or 110). Before graduating, each student is expected to pass both a comprehensive oral examination, covering general knowledge as well as their own application area of environmental management and policy, and an oral defense of the master's technical report or



thesis. A minimum of 30 credit hours is required; most students take closer to 45. At least 15 hours of course credits (exclusive of research and thesis) must be completed within the Environmental Sciences and Engineering Department.

EMP degree requirements for the more academically oriented MS and PhD degrees are established for each student individually by their faculty advisory committee. In each case, the course of study must prepare the student to write a thesis or dissertation which makes a substantive and original contribution to theoretical or empirical understanding of a topic in environmental management and policy.

Water Resources and Engineering

Professors

Philip C. Singer,
Program Area Director
Francis A. DiGiano
Milton S. Heath, Jr.
Donald T. Lauria
David H. Moreau

Professors Emeriti

David H. Howells
Maynard M. Hufschmidt
James C. Lamb III
Daniel A. Okun, *Kenan*

Associate Professor

Dale Whittington
Adjunct Associate Professor
John Briscoe

Assistant Professors

Michael D. Aitken
George Christakos
Cass T. Miller

Adjunct Assistant Professor

Richard A. Luettich, Jr.

The Water Resources Engineering (WRE) program is designed to prepare graduates to enter positions in several different areas of water resources and water quality engineering. Its overall goal is the development of technical skills, social awareness, and professional attitudes necessary for efficient entry and growth in water resources engineering careers. Upon completion of the program the graduate should be qualified to participate in investigating, planning, designing, constructing, operating, and regulating water resources systems and programs in service of man. Past Water Resources Engineering graduates have joined many types of agencies and organizations, including the federal government, state regulatory agencies, public and private utilities, consulting firms, many types of industries, the military services, and research organizations.

The Master of Science in Environmental Engineering degree is offered to students with baccalaureate degrees in engineering from accredited undergraduate programs.

The curriculum is developed to meet specific needs and interests of each candidate within the framework of flexible overall requirements for exposure to content areas judged by the faculty to be basic necessities for the degree. These minimum requirements include 24 semester hours of formal course work, of which 15 hours must be from courses within WRE, and 6 semester hours of MS research and report writing. Most students exceed these minimum requirements, taking additional courses from within WRE, other Program Areas, or other departments on the UNC campus (e.g., Chemistry, Biology, Mathematics, and City and Regional Planning). PhD students have individual course plans which must meet three requirements: a major (e.g., Water Resources Engineering), a 15 semester hour core in a supporting area (e.g., chemistry, biology, mathematics), and 6 semester hours of a research skill (e.g., foreign language, statistics, mathematics, computer programming).

The variety of course offerings provides latitude for the student and faculty adviser to plan a study program meeting needs of the individual candidate.

The master's program may be directed toward: (1) technical aspects of water supply and treatment, wastewater and hazardous waste treatment and disposal, and surface and ground water quality management, (2) planning, engineering, economic and administrative aspects of water resources development and management, or (3) a combination of these approaches. The program requires a minimum of 12 months, although most students remain for one or two additional extra semesters to complete courses or for independent study.

Students with a non-engineering undergraduate degree may also enroll in the WRE program and conduct a related research project, receiving the MS, MSPH, or MPH degree. These degrees permit advanced training of interdisciplinary professionals, such as chemists, biologists, and geologists, for participation in water resources engineering activities, and allow more flexibility for engineers wishing to prepare for practice across broad aspects of the field. Occasionally, engineers employed by health agencies are encouraged or required by them to obtain an MPH or MSPH degrees, often in preparation for administrative posts. These candidates may require less emphasis on design or other technical aspects and more on administration of water resources or community health programs. Science or engineering students interested in the interdisciplinary aspects of water resources planning may prepare for careers based on operations research, systems analysis, resource economics, and other areas not directly related to the design, construction, or operation of water resources systems and wastewater treatment facilities.

The PhD degree with a major in water resources engineering provides the student with more in-depth knowledge through further course work in water resources engineering, a minor or other program of study supporting the chosen area of research, and an intensive period of research. The goal is to develop understanding of current problems in the field beyond that acquired at the master's level. The PhD candidate must master methods for acquiring knowledge from various fields required to solve future problems, techniques for applying that knowledge to synthesize new solutions for water resources problems, and communication of investigational results to others through oral and written presentations.

Many of our PhD graduates have contributed greatly to the profession by becoming productive academicians and training future generations of water resources engineers. Others make major contributions through developing new knowledge as members of research organizations. Many engage in full or part-time consulting, using their advanced knowledge to assist in solving current problems and planning to meet future needs.

Department of Environmental Sciences and Engineering

- ENVR 51** **Environmental Protection (3).** Prerequisite, natural science requirement of the General College. A man-centered study of the health, economic, ecological and aesthetic effects of our use of water, air and land. The physical, biological and chemical processes that occur in nature are studied, particularly as they relate to man's activities and his generation of waste residues, heat, noise and radiation. Methods of control and for abatement of environmental degradation are presented. *Three lecture hours a week, fall, spring.* Francisco.
- ENVR 95** **Analysis and Solution of Environmental Problems (3).** Prerequisites, ENVR 51 and permission of instructor. A selected environmental problem is analyzed for causes, methods of mitigation, and feasibility of proposed solutions. *One lecture and two seminar hours per week.* Crawford-Brown.
- ENVR 98** **Senior Thesis (3).** Prerequisite, permission of instructor. Development, research, and writing of senior thesis for environmental sciences undergraduates. *Three lecture hours per week.* Crawford-Brown.

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- ENVR 99 **Undergraduate Research** (3). Directed readings or laboratory study. Written report is required. May be taken more than once for credit. *6-9 hours per week, fall, spring and summer.* Staff.
- ENVR 100 **Reading in Environmental Sciences and Engineering** (1-6). Prerequisite, permission required for students outside the Department. Extensive library study of a specific subject in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each instance. *Fall, spring and summer.* Staff.
- ENVR 101 **Survey of Environmental Problems** (3). A survey of basic environmental issues for the nontechnologist, including physical dynamics of the natural environment, specific environmental problems and quality control techniques. *Spring.* Crawford-Brown.
- ENVR 111 **Introduction to Environmental Policy** (3). Current issues in environmental protection. Analysis of environmental problems and decisions from the viewpoints of the various disciplines concerned with risk, policy development and environmental management. *Fall.* Shiffman.
- ENVR 117 **Engineered Water Systems and Health** (3). Prerequisite, BIOS 105, MATH 34 or equivalents. Permission of instructor required. The quantitative assessment of the effects of water supply and wastewater disposal practices on infectious and environmentally derived diseases. Examples drawn from developed and under-developed countries. Attention given to implications for engineering design. *Fall.* Briscoe.
- ENVR 118 **Quantitative Studies for Environmental Sciences** (3). Applied mathematics from the viewpoint of those studying environmental science. Specific aspects of differential and integral calculus are developed as needed in environmental hygiene. *Second summer session.* Reist.
- ENVR 121 **Aquatic and Atmospheric Chemistry Processes and Mechanisms** (3). Prerequisite, one year of college chemistry. Material and chemical cycling, transport and reactions, redox and photochemistry, equilibrium kinetics of substances in atmospheric and aquatic environments. *Three lecture hours per week, fall.* Staff.
- ENVR 122 **Chemical Equilibria in Natural Waters** (3). Principles and applications of chemical equilibria to natural waters. Acid-base, solubility, complex formation, and redox reactions are discussed. Problem-solving approach is used to illustrate chemical speciation and environmental implications. *Three lecture hours a week, fall.* Singer.
- ENVR 123 **Organic Materials in Natural Waters** (3). Prerequisites, organic chemistry, instrumental analysis or permission of the instructor. Origins of natural product organic materials in rivers and lakes. Survey of synthetic organic waste sources, microbial transformations, and metal transport properties. Organic water quality monitoring and rationale for water quality criteria and standards. *Spring, alternate years.* Christman.
- ENVR 124 **Environmental Analytical Chemistry** (3). Sampling, sample treatment, data evaluation, electrochemical, spectrophotometric, and mass spectral techniques for students with no analytical chemistry background. *Three lecture hours per week, spring.* Shuman, Charles.
- ENVR 127 **Oceanography** (MASC 101, BIOL 126, GEOL 101) (3). Prerequisites, one college-level course in biology, chemistry, geology, or physics. An interdisciplinary study of the sea and the interrelationship of marine processes. *Three lecture hours a week, fall,* Neumann and staff; *spring,* Frankenberg and staff.

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- ENVR 128 Chemical Oceanography (MASC 105) (4).** Prerequisites, one semester of physical chemistry or ENVR 122, CHEM 180 or equivalent. Variation and abundance of the sea water constituents, and the chemical, physical and biological processes contributing to their distribution as well as problems of dispersion of conservative and nonconservative substances are considered. *Spring.* Martens, Johnson.
- ENVR 131 Biological and Ecological Processes and Mechanisms (3).** Prerequisites, one year each of college chemistry and biology. Interaction of biological systems with the environment. Fluxes and transformations of materials in the biosphere. Emphasis on fate and effects of anthropogenic substances. *Three lecture hours per week, fall.* Staff.
- ENVR 132 Limnology and Water Pollution (4).** Prerequisites, one year each of biology and chemistry. Basic aspects of physical, chemical, and biological limnology, including impacts of anthropogenic pollutants and relationships to watersheds, streams, and estuaries. *Three lecture and two laboratory hours per week, spring.* Kuenzler.
- ENVR 133 Sources, Transport, and Fate of Environmentally Important Materials (3).** Prerequisites, one year of college chemistry, and one semester each of college physics, calculus, and biology or permission of the instructor. Multimedia processes important in environmental compartments. Development of predictive abilities for spatial and temporal alterations and movements of materials. *Three lecture hours per week, spring.* Staff.
- ENVR 134 Ecological Microbiology (3).** Prerequisite, one course in general microbiology. A description of microbial populations and communities, the environmental processes they influence, and how they can be controlled to the benefit of man. *Two lecture and three laboratory hours per week, spring.* Pfaender.
- ENVR 135 Biology in Environmental Science (3).** Prerequisite, general chemistry. An introduction to biology, including principles of biochemistry, cell structure, classification, and ecology. Laboratory emphasizes techniques utilized in measurement and control of environmental pollution. *Two lecture and two laboratory hours per week, fall.* Francisco.
- ENVR 136 Biological Oceanography (BIOL 140, MASC 104) (4).** Prerequisites, BIOL 54 or BIOL 105 or permission of instructor. Physical, chemical and biological factors characterizing estuarine and marine environments emphasizing factors controlling plant and animal populations including methods of analysis, sampling, and identification. *Five lecture and laboratory hours a week, summer.* Staff.
- ENVR 137 Ecology of Wetlands (4) (MASC 137).** Prerequisites, one year biology, one semester ecology, one year chemistry and permission of the instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on the systems of the southeastern U.S. *Fall.* Kuenzler.
- ENVR 141 Air and Industrial Hygiene (3).** Not open to students who have received credit for ENVR 142. Problem definition, sources of information, health effects, legislative framework, and control methods. Hazard recognition, evaluation, and remediation approaches for community and industrial environments. *Fall.* Fox.
- ENVR 142 Interdisciplinary Approaches to Occupational Health (2).** Prerequisite, permission of instructor. Collaborative approach to investigate occupational health problems utilizing expertise of multidisciplines including: nursing, physi-
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- cian, industrial hygienist, and safety professionals. Includes didactic sessions, worksite visits and a collaborative project. *Two lecture hours per week, fall.* Staff.
- ENVR 144 **Industrial Toxicology** (2). Toxicological assessment of and a case presentation of related exposure is given. A conceptual approach is utilized to design appropriate programs to prevent worker ill health due to industrial toxicant exposure. *Two lecture hours per week, spring.* Staff.
- ENVR 145 **Introduction to Aerosol Science** (4). Prerequisite, admission to the Department of Environmental Sciences and Engineering or permission of the instructor. Physical and chemical principles underlying behavior of particles suspended in air. Topics include rectilinear and curvilinear motion of the particles in a force field, diffusion, evaporation and condensation, electrical and optical properties and particle coagulation, as well as the behavior of the cloud *in toto*. *Three lecture and two laboratory hours a week, fall.* Reist, Leith.
- ENVR 145L **Aerosol Science Laboratory** (2). Pre- or corequisite, ENVR 145. Basic laboratory exercises in aerosol sciences. *Fall.* Reist, Leith.
- ENVR 147 **Occupational Safety** (2). Fundamentals of occupational safety with emphasis on legislation and organization of industrial safety programs including hazard recognition, analysis, control and motivational factors pertaining to industrial accident prevention. *Fall.* Staff.
- ENVR 149 **Health Hazards of Industrial Operation** (3). Prerequisite, ENVR 141. An introduction of the health hazards associated with the various unit operations of industry. Field trips to local industries are planned. *Spring.* Flynn.
- ENVR 153 **Environmental Management and Policy** (3). (PLAN 153, PUPA 153). Prerequisites, ENVR 51 or graduate standing. Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, and instruments, policy analysis, and major elements of American environmental policy. Lectures and case studies. *Three lecture hours per week, fall.* Andrews.
- ENVR 158 **Mathematical Methods of Environmental Modeling** (3). Prerequisite, calculus. Mathematical basis of environmental models is reviewed, including an overview of axiomatic systems, differential equations, transforms, parameter estimation, and numerical simulations. *Three lecture hours per week, fall.* Crawford-Brown.
- ENVR 159 **Analytic Thought and Environmental Risk** (3). Prerequisite, permission of instructor. The principles of logical analysis are developed and applied to environmental problems. Concepts such as evidence, inference, and proof are formalized for calculations of environmental risk. *Two lecture hours and one seminar hour per week, spring.* Crawford-Brown.
- ENVR 163 **Radiation Physics and Instrumentation** (4). Prerequisite, calculus. Radioactive decay and the interaction of radiation with matter. Laboratory study of radiation measurements. *Three lecture and three laboratory hours per week, fall.* Watson, Crawford-Brown.
- ENVR 164 **Field Observations in Radiological Hygiene** (2). Prerequisite, permission of instructor. Field observations of health physics practices at nuclear fuel cycle facilities and government nuclear facilities. Field fee, \$175.00. *Spring.* Watson.
- ENVR 165 **Advanced Radiological Laboratory** (2). Intensive radiological laboratory training at Oak Ridge Associated Universities. Tour of research facilities at Oak Ridge National Laboratory. Field fee, \$200.00. *Spring.* Crawford-Brown.
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- ENVR 167 Introduction to Medical Physics (2).** Permission of the instructor required. The physics of radiation therapy, diagnostic radiology, and nuclear medicine are introduced by practicing clinical physicists. *Fall.* Crawford-Brown, Chaney, Johnston, Washburn.
- ENVR 168 Comprehensive Radiation Biology (2).** (ORDI 190). Prerequisite, BIOL 11. A survey of the biological effects of ionizing and non-ionizing radiations ranging from the molecular to the ecosystem level. Related topics such as the effects of nuclear war and food irradiation are also included. *Fall.* Tyndall.
- ENVR 171 Reactor and Mass Transport Principles (3).** Prerequisites, MATH 124 or equivalent. Application of chemical engineering fundamentals to describe physical, chemical, and biological processes important for water/wastewater treatment, air pollution control, and processes in natural systems. *Three lecture hours per week, fall.* DiGiano.
- ENVR 174 Water and Wastes Treatment Processes (4).** Prerequisite, ENVR 122. Permission of instructor required, or corequisite, ENVR 131. A study of unit processes for water and waste water treatment. Processes discussed include gas transfer, coagulation, disinfection, absorption, demineralization, sedimentation, filtration, aerobic and anaerobic biological treatment. *Three lecture and two lab hours a week, spring.* Singer.
- ENVR 176 Ground Water Engineering (3).** Prerequisites, MATH 31 and 32. Use of analytical solutions to define ground water movement and contaminant transport in subsurface environments. *Three lecture hours a week, fall.* Miller.
- ENVR 183 Special Topics in Water Resources (2).** Prerequisite, permission of instructor. Interdisciplinary exploration of the principal issues involved in water resource planning, conservation, development and management. Includes the nature of water resources, principal water uses and conflicts, public objectives and policy issues, institutional arrangements, legal framework, planning and governmental agency programs. *Spring.* Faculty.
- ENVR 190 Reading in Environmental Health Sciences (1-6).** Prerequisite, permission of the instructor. Extensive library study of a specific subject in Environmental Health Sciences. *One to six seminar hours per week, fall, spring, summer.* Staff.
- ENVR 191 Health and Ecological Effects of Environmental Agents (3).** Prerequisites, basic biology, chemistry through organic, math through calculus; permission of instructor if prerequisites not met. Interactions of environmental agents (chemicals, infectious organisms, radiation) with biological systems including humans, with particular attention to routes of entry, distribution, metabolism, elimination, and mechanisms of adverse effects. *Three lecture hours per week, fall.* Staff.
- ENVR 192 Techniques in Environmental Health Sciences (1).** Prerequisites, basic biology, chemistry through organic, math through calculus; permission of instructor if prerequisites not met. A practical introduction to the measurement of biological end-points, emphasizing adverse effects of environmental agents, using laboratory and field techniques. *Two laboratory hours per week, fall.* Staff.
- ENVR 195 Environmental Health Microbiology (3).** Prerequisite, introductory course in microbiology, or permission of instructor. Presentation of the microbes of public health importance in water, food, air, including their detection, occurrence, transport, and survival in the environment; epidemiology and risks from environmental exposure. *Two lecture and two laboratory hours per week, spring, 1993 and alternate years.* Sobsey.
- ENVR 198 Biophysical Theory of Environmental Health (3).** The biophysical basis of models of intake, metabolism, transformation and effects of environmental
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pollutants in organisms is developed. Evidence supporting the axiomatic structures is reviewed. *Three lecture hours per week, fall.* Crawford-Brown.

- ENVR 200 Problems in Environmental Sciences and Engineering** (1 or more). Departmental permission required. For students outside the Department who desire to undertake individual study of a specific problem in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each individual instance. *Two or more hours a week, fall, spring, summer.* Staff.
- ENVR 210 Issues in Environmental Management** (1). The practice of environmental management will be presented by persons engaged in professional practice in government, industry, research and consulting. *Fall.* Shiffman, Andrews.
- ENVR 211 Methods in Environmental Management** (3). The strategies and techniques used in the management of environmental protection programs. Safety evaluations, regulatory processes, institutional arrangements and organization responses. *Fall.* Shiffman.
- ENVR 212 Administration of Environmental Protection Programs** (3). Organization and operation of environmental protection programs to include administrative processes, program analysis, performance evaluation and project management methods. *Spring.* Shiffman.
- ENVR 217 Systems Analysis in Environmental Planning** (3). Prerequisite, calculus. Systems approach and scientific method. Various approaches to system design. Mathematical models. Production, benefit, loss and cost functions. Constrained optimization. Marginal analysis. Linear programming. Application of techniques to systems for the management of environmental quality. *Fall.* Staff.
- ENVR 219 Water Policy in Lesser Developed Countries** (3). (PLAN 219) Permission of instructor. Seminar on policy and planning approaches for providing improved community water and sanitation services in developing countries. Topics covered include the choice of appropriate technology and level of service; pricing, metering, and connection charges; cost recovery and targeting subsidies to the poor; water vending; community participation in the management and operation of water systems; and rent-seeking behavior in the provision of water supplies. *Three seminar hours per week, spring.* Whittington.
- ENVR 221 Instrumental Methods of Analysis** (3). Prerequisites, inorganic and analytical chemistry and permission of the instructor. Principles and techniques of instrumental chemical analysis, including optical, electrical and separation methods. Laboratory sessions include adsorption, spectrophotometry, potentiometry, amperometry, gas chromatography, GC-mass spectrometry. *Two lecture and four laboratory hours a week, spring.* Shuman.
- ENVR 222 Special Topics in Environmental Chemistry** (1-3). Permission of instructor. Current topics in aquatic and atmospheric chemistry. *One to three lecture hours per week, fall, spring.* Staff.
- ENVR 225 Analysis of Trace Organics** (3). Prerequisites, CHEM 61-62, CHEM 181-182 and PHYS 24-25. Permission of instructor if prerequisites not met. Basic principles of isolation, separation and identification of trace organic chemicals in environmental and/or biological samples including solvent extraction, liquid and gas chromatography and mass spectrometry. *Spring.* Hass, Albro.
- ENVR 231A Limnological Methods** (2). Prerequisites, basic limnology and statistics; must register for 231B in the second session. Professional preparation for field study of freshwater aquatic systems. *Two lecture and ten laboratory hours a week, first summer session.* Francisco.

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- ENVR 231B** **Limnological Methods (2).** Prerequisite, ENVR 231A. *Second summer session.* Francisco.
- ENVR 232** **Special Topics in Environmental Biology (1–3).** Permission of instructor. Current topics in aquatic biology and ecology. *One to three lecture hours per week, fall, spring.* Staff.
- ENVR 238** **Microbial Degradation of Xenobiotics (3).** Prerequisites, ENVR 122 and 131 or 134 or an undergraduate course in microbiology. Presents and unifies emerging bodies of knowledge in microbial ecology, physiology, and genetics and integrates them into discussions of chemical degradation in natural and engineered systems. *Three lecture hours per week, fall of even-numbered years.* Aitken and Pfaender.
- ENVR 241** **Industrial Ventilation Design (3).** Prerequisites, engineering degree and permission of instructor. Corequisite, ENVR 241L. Engineering design of industrial exhaust systems and control of heat exposures in occupied spaces. *Fall.* Staff.
- ENVR 241L** **Industrial Ventilation Laboratory (1).** Corequisite, ENVR 241. Basic laboratory exercises in aerosol sciences. *Fall.* Harris, Hickey.
- ENVR 242** **Industrial Hygiene Practice (3).** Prerequisites, ENVR 143 and ENVR 145. Methodology and philosophy of evaluating the industrial environment for stresses and toxic substances which affect the health of the worker. *Spring.* Staff.
- ENVR 243** **Instrumentation and Data Acquisition (3).** Permission of instructor required. Concepts and principles employed in electronic-aided measurements of air quality including acquisition of measurements, principles of input transaction and online minicomputers. *Fall.* Jeffries.
- ENVR 244** **Industrial Hygiene Laboratory (3).** Prerequisite, ENVR 145; corequisite, ENVR 242. Physical and chemical techniques for measuring industrial exposures. Practical experiments illustrate techniques applicable to the industrial hygiene survey. *One lecture and four laboratory hours a week, spring.* Reist.
- ENVR 245** **Air Pollution Control (3).** Prerequisite, ENVR 141. Engineering control of air pollution control systems and discussion of air pollution regulation and standards. *Spring.* Staff.
- ENVR 248** **Industrial Medicine—Practice and Management (3).** Prerequisite, ENVR 143 or equivalent. The technical factors to be considered in decision making and the roles and responsibilities of the industrial physician, nurse and industrial hygienist in the management of the work force. The etiology, diagnosis, treatment and prevention of diseases and stresses found in modern industry are discussed with applications for the use of general practitioners, health administrators, public health nurses and industrial professionals. *Spring.* Staff.
- ENVR 252** **Environmental Risk Assessment (3).** Prerequisite, permission of instructor. The characterization of population exposures and the evidence used to identify environmental substances that may pose a human health risk. The theory and methods for quantitatively estimating risk. *Spring.* Turner.
- ENVR 253** **Environmental Policy Analysis (3).** (PLAN 253, PUPA 253) Prerequisite, ENVR 153. Advanced topics and applications in environmental policy analysis. *Three lecture hours per week, fall.* Andrews.
- ENVR 254** **Food Safety Policy (3).** Food safety will be discussed in respect to the development and implementation of policy, food legislation, regulation and other components of food safety programs. *Three lecture hours a week, spring.* Shiffman.
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- ENVR 255 **Management of Hazardous Waste (3)**. Prerequisite, CHEM 61 or equivalent. The classification, chemistry and toxicology of hazardous wastes will be presented. Control technologies, regulatory policies and management strategies are examined. *Fall*. Turner.
- ENVR 257 **Current Applications in Environmental Management (4)**. Interdisciplinary group project. Analysis of a current environmental management problem. Topic changes each year. *Three lecture and one laboratory hour per week, spring*. Amaral, staff.
- ENVR 263 **Radiation Hazards Evaluation I (3)**. Prerequisite, calculus. The physics of ionizing radiations and the principles of radiation dosimetry, hazards evaluation and protection are presented. *Three lecture hours per week, spring*. Watson.
- ENVR 264 **Radiation Hazards Evaluation II (3)**. Prerequisite, ENVR 263. Internal and external hazards of ionizing radiation are evaluated. Problems in hazards evaluation and radiation protection of types included in certification examinations of the American Board of Health Physics are studied. *Three lecture hours per week, fall*. Watson.
- ENVR 267 **Medical Physics Rotation (3)**. Students will spend 9 hours per week in detailed discussion and application of specialized topics of Medical Physics within the Radiology Dept. Time will be spent in therapy, diagnosis and imaging. *Spring*. Crawford-Brown, Chaney, Johnston and Washburn.
- ENVR 271 **Engineering Modeling of Aquatic Systems (3)**. Prerequisite, permission of instructor. Examination of selected physical, chemical, and biological phenomena in natural aquatic systems. Use of mathematical models for water quality prediction and control. *Spring, alternate years with ENVR 272*. Lauria.
- ENVR 272 **Design of Water Systems (3)**. Permission of instructor required. Use of mathematical models and computer programs for designing water systems, including pumping stations, reservoirs, water distribution and wastewater collection networks. *Spring, alternate years with ENVR 271*. Lauria.
- ENVR 273 **Water and Wastewater Treatment Plant Design (3)**. Prerequisite, ENVR 174. The application of the theory of water and wastewater treatment to the design of municipal treatment facilities. The course includes the principles of design and modern design practices. The seminar is devoted to the design and analysis of design of specific works for water and wastewater treatment. *Summer*. Briscoe.
- ENVR 274 **Physical/Chemical Treatment Processes (3)**. Prerequisites, ENVR 122 or equivalent, and ENVR 171 or equivalent. Fundamental descriptions of coagulation, precipitation, sedimentation, filtration, adsorption, ion exchange and membrane processes; applications to water and wastewater treatment. *Three lecture hours per week, spring*. DiGiano, Singer.
- ENVR 275 **Biological Treatment Processes (3)**. Prerequisite, ENVR 171 or equivalent. Theory and practice of biological processes used for conventional and advanced treatment of wastewater. *Three lecture hours per week, spring*. Aitken.
- ENVR 276 **Industrial Waste Treatment (3)**. Prerequisites, ENVR 122, 274, permission of instructor. Principles and practice of removing pollutants from industrial wastes by physical, chemical, biological, and thermal processes. Students visit industrial facilities and prepare oral and written reports on waste generation and management. *Three lecture hours per week, fall of odd-numbered years*. Aitken.
- ENVR 277 **Diffusive Transport in Environmental Systems (3)**. Prerequisites, ENVR 274 and permission of instructor. Diffusive transport at phase boundaries and
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- within phases and porous media. Applications to process design of adsorption, gas-transfer, and bio-oxidation systems and to analyze transport in natural environments. *Fall, alternate years.* DiGiano.
- ENVR 278 Stochastic Hydrology (3).** Prerequisite, BIOS 135 or equivalent. Stochastic modeling. Hydrologic processes (spatial, temporal, spatiotemporal). Correlation and spectral analyses. Generalized uni- and multivariate study of surface processes: flow simulation, flood forecasting, rainfall-runoff processes. Filters (Kalman, Factorable). Networks. Geostatistics. *Spring.* Christakos.
- ENVR 279 Random Field Modeling of Physical Processes (3).** Prerequisite, BIOS 135 or equivalent; calculus through differential equations is desirable. Science of the probable. Random fields. Physical significance and methodological theses. Spatial and spatiotemporal variability. Ordinary and generalized fields of natural processes. Transport-type models. Bayesian/Maximum entropy estimation. *Three lecture hours per week, fall.* Christakos.
- ENVR 281 Modeling Ground Water Systems (3).** Prerequisite, permission of instructor. Numerical modeling methods for solving the partial differential equations governing mass, momentum, and energy in ground water. *Spring.* Miller.
- ENVR 282 Public Investment Theory and Techniques (PLAN 232) (3).** Theory and techniques of public investment planning and benefit cost analysis involving syntheses of economic, political and technologic aspects. Special focus on project and program evaluation in the Third World. *Spring.* Whittington.
- ENVR 283 Natural Resource Law and Policy (PLAN 233) (3).** Prerequisite, permission of instructor. An examination of the law of resource use and development, its administration and underlying policies. Particular attention to water rights law, regulatory law, and natural resource administration. Regulatory aspects of pollution control programs will be covered. *Fall.* Heath.
- ENVR 284 Water Resources Planning and Policy Analysis (PLAN 234) (3).** Prerequisite, permission of the instructor. Introduction to water resources planning and management. Emphasis on federal and state water resources policies and the development of analytical skills for identification of environmental problems associated with urban water resources development. *Fall.* Moreau.
- ENVR 291 Principles of Chemical Carcinogenesis (2).** Prerequisite, ENVR 190 or equivalent. Bioactivation of carcinogens, interaction of activated metabolites with DNA, and their effects on DNA structure, replication, repair, and the control of these processes during development of chemically-induced carcinogenesis. *Two lecture hours per week, spring.* Gold.
- ENVR 292 Molecular Approaches to Environmental Toxicology (3).** Prerequisites, ENVR 190 or equivalent or permission of the instructor. Recent advances in molecular biology applied to elucidation of problems in environmental toxicology with illustrations from the current literature. *Three lecture hours per week, spring.* Ball.
- ENVR 295 Environmental Virology (4).** Prerequisites, introductory course in microbiology or permission of instructor. Ecological, environmental health and fundamental aspects of virology, with special emphasis on viruses in water, food, and air. *Three lecture and two laboratory hours per week, spring, 1992, and alternate years.* Sobsey.
- ENVR 300 Research in Environmental Sciences and Engineering (2 or more).** Prerequisite, consultation with the faculty and approval of subject and proposed program. Research in environmental sciences and engineering for students outside the Department. *Four or more hours a week, fall, spring, summer.* Staff.
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- ENVR 301 **Seminar in Environmental Sciences and Engineering** (1 or more). Readings and discussions to provide opportunity to develop new concepts and topics in various aspects of environmental sciences and engineering. *Fall, spring, and summer.* Staff.
- ENVR 311 **Seminar in Environmental Health** (1). Open by special arrangement to students doing advanced graduate work. Directed readings and reports on recent advances concerned with environmental health. Reports of current research and review of principal journals in environmental health, sanitary engineering and sanitary sciences. *Two seminar hours a week, fall and spring.* Staff.
- ENVR 314 **Seminar on Current Industrial Hygiene Issues** (1). ENVR 242, corequisite; permission of instructor required. Discussion on current topics affecting the field of industrial hygiene. *Two seminar hours per week, spring.* Reist.
- ENVR 320 **Research in Environmental Chemistry** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Christman, Shuman, Singer, Millington.
- ENVR 321 **Reduction/Oxidation Processes in the Aquatic Environment** (1). Redox processes in the aquatic environment; thermodynamics and kinetics; applications related to oxidation of natural and anthropogenic organics. *One lecture hour per week, spring.* Glaze.
- ENVR 322 **Photochemical Processes in the Aquatic Environment** (1). Prerequisite, physical chemistry. Photochemical processes in aquatic systems; formation of reactive intermediates and the transformation of natural and anthropogenic organics. *One lecture hour per week, spring.* Glaze.
- ENVR 323 **Advanced Oxidation Processes for Water and Wastewater Treatment** (1). Prerequisite, physical chemistry. Oxidation processes for treatment of natural and anthropogenic organics, using ozone peroxides, and UV radiation. *One lecture hour per week, spring.* Glaze.
- ENVR 324 **Chemistry of Humic Substances** (1). Prerequisite, ENVR 121 or 133. Humic substances in nature; their formation, properties and methods of isolation. Role of degradation studies in structure determination. *One lecture hour per week, fall.* Christman.
- ENVR 325 **Trace Elements: Geochemistry and Environmental Issues** (1). Prerequisites, four semesters of undergraduate chemistry and permission of the instructor. Geochemical cycles and processes of selected trace elements such as Pb, Hg, Sn, As, Se, Cd. Health, regulatory, and analytical issues. Term paper. *One lecture hour per week, on request.* Shuman.
- ENVR 326 **Advanced Techniques in Mass Spectrometry** (1). Prerequisites, ENVR 225 and permission of the instructor. Theory and environmental applications of mass spectrometric techniques including high-resolution mass spectrometry, mass spectrometry/mass spectrometry, and alternate modes of ionization. *One lecture per hour per week, on request.* Charles, Hass.
- ENVR 327 **Projects in Mass Spectrometry** (1). Prerequisites, ENVR 225 and permission of the instructor. Experiments in mass spectrometry for advanced students. *Two laboratory hours per week, on request.* Charles, Hass.
- ENVR 330 **Research in Environmental Biology** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Kuenzler, Weiss, Pfaender, Sobsey, Francisco.
- ENVR 333 **Seminar in Aquatic and Atmospheric Sciences** (1-3). Prerequisites, ENVR 121 or ENVR 135. Advanced topics seminar in aquatic and atmospheric sciences. *One to three seminar hours per week, fall, spring.* Staff.
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- ENVR 334 **Environmental Microbiology Methods (1)**. Prerequisite, general microbiology or ENVR 134. Microbiological analytical methods that can be used in environmental setting. Methods for assessing numbers, biomass, metabolic activity, and genetics. *One lecture hour per week, on request.* Pfaender.
- ENVR 337 **Estuarine Ecology (1)**. Prerequisites, ENVR 131 and 135 or permission of the instructor. Advanced estuarine ecology emphasizing transport, processing, and fate of natural and anthropogenic materials in waters, sediments, and biota. *One lecture hour per week, on request.* Kuenzler.
- ENVR 340 **Research in Air and Industrial Hygiene (1-9)**. Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Fox, Jeffries, Reist, Gold, Hickey, Leith, Kamens.
- ENVR 341 **Engineering Research in Air and Industrial Hygiene (1-9)**. Prerequisite, consultation with the faculty and approval of the subject and proposed program. *Fall, spring, summer.* Fox, Jeffries, Reist, Hickey.
- ENVR 350 **Research in Environmental Management and Protection (1-9)**. Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Christman, Shiffman, Turner, Gold, Andrews.
- ENVR 360 **Research in Radiological Hygiene (1-9)**. Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Watson, Crawford-Brown.
- ENVR 361 **Atmospheric Solar Radiation (1)**. Prerequisites, ENVR 133 or 121. Solar radiation transfer, surface irradiance and actinic flux, atmospheric photolysis rates of chemical species, Broadband and spectral solar radiation measurement and simple numerical models of radiation transfer. *One lecture hour per week, spring.* Jeffries.
- ENVR 362 **Urban and Regional Atmospheric Chemistry (2)**. Prerequisite ENVR 121. Explicit atmospheric chemistry of volatile organic carbon, oxides of nitrogen, and oxides of sulfur. Formulation and testing of condensed photochemical reaction mechanisms for use in air quality models. *Two lecture hours per week, fall.* Jeffries.
- ENVR 363 **Global Atmospheric Chemistry (1)**. Prerequisites, ENVR 121, 362. Photochemical processes in the global atmosphere. *One lecture hour per week, fall.* Staff.
- ENVR 364 **Measurement of Ozone and Oxides of Nitrogen in Air (1)**. Prerequisites ENVR 121 or ENVR 141. Calibration and measurement of ozone and oxides of nitrogen using research instruments. *One laboratory hour per week, on request.* Jeffries.
- ENVR 365 **Measurements of Volatile Organic Compounds in Air (1)**. Prerequisite, ENVR 121 or ENVR 141. Calibration and measurement of volatile organic compounds using research instruments. *One laboratory hour per week, on request.* Jeffries.
- ENVR 366 **Measurement of Gas-Particle Interactions (1)**. Prerequisite, ENVR 121 or ENVR 141. Organic and inorganic reactions of gas and particle interactions; polycyclic aromatic hydrocarbons on soot particles; acid aerosols: laboratory projects using chambers and associated instrumentation. *Two laboratory hours per week, on request.* Kamens.
- ENVR 367 **Development of Atmospheric Chemistry Models (1)**. Prerequisite, ENVR 121. Formulation of computer codes for simulating atmospheric chemistry. *One lecture hour per week, on request.* Jeffries.
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- ENVR 368 **Operation of Urban Airshed Models (1).** Prerequisites, ENVR 121, ENVR 367. Application of an urban-scale three-dimensional transport and chemical reaction model to photochemical oxidant problems. *One lecture hour per week, on request.* Jeffries.
- ENVR 369 **Air Pollution Regulatory Policy Issues (1).** Prerequisites, ENVR 121, ENVR 362. Role of atmospheric science in the formulation of the Clean Air Act and EPA oxidant regulatory policies. *One lecture hour per week, on request.* Fox. Jeffries.
- ENVR 370 **Investigations in Water Resources Engineering (1-9).** Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Lauria, Okun, Briscoe, DiGiano, Singer.
- ENVR 390 **Research in Environmental Health Sciences (1-9).** Prerequisites, consultation with the faculty and approval of subject and proposal program. May be repeated. Hours and credits to be arranged. *One to nine laboratory hours per week, fall, spring, summer.* Staff.
- ENVR 391 **Seminar in Environmental Health Sciences (1).** Prerequisite, permission of instructor for students outside program area. Discussions and surveys on current critical issues in environmental health sciences. *On request.* Staff.
- ENVR 392 **Master's Technical Report (1-9).** The technical report requirement for MSPH, MPH, and MSEE candidates is satisfied by the extensive study of a problem in environmental sciences and engineering. Study may extend over one or more semesters and credit is assigned accordingly.
- ENVR 393 **Master's Thesis (1-9).**
- ENVR 394 **Doctoral Dissertation (3-9).**
- ENVR 400 **General Registration (0).**



Epidemiology

Chair

Barbara S. Hulka
Kenan Professor

Registrar

Joyce Allen
Telephone No. (919) 966-7458

FACULTY

Professors

Gerardo Heiss
Michel A. Ibrahim, *Dean*
Berton H. Kaplan
David G. Kleinbaum
John R. Seed
Carl M. Shy

Alumni Distinguished Professor

Herman A. Tyroler

Professor Emeritus

Cecil G. Sheps

Research Professor

Richard C. Graves

Clinical Professors

Gordon H. DeFries
Curtis G. Hames
David S. Sheps
Michael R. Swift
Edward H. Wagner

Adjunct Professors

James D. Beck
Dan German Blazer
Joan Cornoni-Huntley
Richard B. Everson
Robert H. Fletcher
Jean G. French
Jack D. Griffith
Harry A. Guess
Carl G. Hayes
Siegfried H. Heyden
Sherman A. James
Ulrich Keil
J. Newton MacCormack
Melinda S. Meade
George R. Parkerson, Jr.
John W. Stamm
Hugh H. Tilson

James F. Toole
Allen J. Wilcox

Associate Professors

James E. Hall
David A. Savitz
Victor J. Schoenbach

¹*Associate Professor Emerita*

Caroline Becker

Clinical Associate Professors

Brian A. Boehlecke
Desmond K. Runyan
Robert S. Sandler
Philip D. Sloane
Mark E. Williams

Adjunct Associate Professors

Naomar Almeida-Filho
Dragana A. Andjelkovich
John R. Crouse
Judith A. Fortney
Raymond S. Greenberg
Michael D. Hogan
Richard J. Levine
Gory J. Love
Neil E. Mackenzie
Walter J. Rogan
Michael Rosenberg
Dale Sandler
Ilene C. Siegler
David S. Strogatz

Assistant Professors

Ralph S. Baric
Irva Hertz-Picciotto
Beth M. Newman
Lola V. Stamm
James C. Thomas
David J. Weber
Kristen A. Weigle

¹*Retired March 1990.*

Research Assistant Professors

Sioban D. Harlow
Suzanne E. Landis
Dana P. Loomis
Margaret F. McCann
Joellen M. Schildkraut
Marilyn F. Vine
Steven B. Wing

Adjunct Assistant Professors

Timothy E. Aldrich
Donna D. Baird
W. Eugene Broadhead
J. Trig Brown
Douglas S. Campbell
Thomas B. Cole
Gwen W. Collman
Frank V. Crout

Russell P. Harris
James E. Higgins
Nancy S. Hunter
Rodney J. Jackson
Eric S. Johnson
Kathryn Magruder-Habib
Peter A. Margolis
Dexter L. Morris
Miquel S. Porta
Gregory P. Samsa
C. Gregory Smith
Patricia S. Tennis
Christine A. Uhlinger
Hetty A. Waskin
Bonnie C. Yankaskas

Adjunct Research Instructor

Joanne M. Garrett

The Department of Epidemiology offers research training in a number of specialized areas including cancer, cardiovascular diseases, environmental and occupational problems, health services/clinical, reproductive health, infectious disease, aging, health promotion/disease prevention, pharmacoepidemiology, and biochemical factors. The study program includes courses, seminars and tutorials designed to help the student develop research and teaching skills in epidemiology. Degrees offered by the Department include the Master of Public Health, Master of Science in Public Health, Doctor of Philosophy, and Doctor of Public Health.

Students wishing to enroll in the program should have a background in the biological sciences, or in the behavioral sciences with supporting courses in the biological sciences. They should have strong mathematical preparation, and should demonstrate a clear research commitment.

The MPH degree program is a course of study designed for persons with terminal professional degrees in the biomedical or behavioral sciences. Students are trained for professional public health practice or for teaching positions, usually in schools of medicine. The MSPH is designed for students who do not have a relevant advanced degree and who plan to proceed for the PhD program.

Both master's programs require a minimum of thirty semester hours of credit, although most students complete additional credit hours. Requirements include the School core courses described on page 20 (for the MPH) and page 22 (for the MSPH). For both master's programs, the Department requires in addition a sequence of methods courses, as well as one or more substantive courses in Epidemiology. Other coursework may be determined with the adviser to meet the needs of the individual student.

All master's candidates must complete a comprehensive written examination and a master's paper, and present their research on a scheduled presentation day or at another approved forum.

Master's programs average two years, although in some cases MPH students may complete the coursework portion in twelve to eighteen months.

The PhD is the most common doctoral program in epidemiology. The Graduate School residency requirements must be completed, with at least three semester hours of credit for dissertation (EPID 394). In addition a required sequence of methods courses and two or more substantive courses in epidemiology are required. Other coursework is planned to meet the needs of the individual student. Doctoral students must perform a one-semester teaching internship in an introductory-level Epidemiol-

ogy course. A two-part written examination and an oral examination comprise the preliminary doctoral examinations. A dissertation of high quality, involving an original research problem and demonstrating a highly sophisticated level of skill, must be submitted and defended.

Students in the DrPH program must fulfill the School of Public Health requirements given on page 26 in addition to the requirements described above.

Doctoral programs average three years following the master's or terminal professional degree. A doctoral program prepares the student for a research or research and teaching career, most often in a university, federal or state agency or private research institution.

The Department of Epidemiology maintains strong relationships with other departments and schools of the University. Since the program of study is designed around the unique interests of the individual student and the requirements of the research proposal, students are encouraged to make use of the resources of the University. Students take courses in other departments and curricula within the School of Public Health as well as relevant work in the Schools of Medicine, Dentistry, Nursing, Pharmacy, and the Departments of Sociology, Psychology, Geography and Anthropology, and sometimes other areas.

The faculty of the Department of Epidemiology believe strongly in an apprenticeship mode of learning. Much of the work is in the form of association with individual faculty members, leading to achievement of a set of skills and competencies enabling the student to function comfortably in the field.

Department of Epidemiology

- EPID 140** **Problems in Epidemiology** (1 or more). A course for students who wish to make an intensive study of some special problems in epidemiology. *Fall, spring, and summer.* Faculty.
- EPID 141**
- EPID 160** **Principles of Epidemiology** (3). Pre- or corequisite, introductory biostatistics. An introductory course that considers the meaning and scope of epidemiology and the uses of morbidity, mortality and other vital statistics data in the scientific appraisal of community health. *Three lecture hours a week, fall.* McCann, Wing.
- EPID 168** **Fundamentals of Epidemiology** (4). Permission required for non-majors. An intensive introduction to epidemiologic concepts and methods for students intending to engage in, collaborate in, or interpret the results of epidemiologic studies. Some familiarity with biomedical concepts may be needed. An alternate to EPID 160 for satisfying the SPH core requirements. *Three lecture and two seminar hours a week, fall.* Schoenbach, Schildkraut, Hulka.
- EPID 201** **Epidemiologic Research Methods** (3). Prerequisites, EPID 168; introductory biostatistics; and permission of instructor. A second-level course on conduct of epidemiologic research. Focuses on dealing with both conceptual problems of applying the scientific method and practical issues encountered in carrying out the work. *Three lecture hours a week, spring.* Harris, Savitz, Thomas.
- EPID 218** **Introduction to Infectious Disease Epidemiology and Survey of Infectious Diseases of Public Health Importance** (3). Pre- or corequisites: introductory-level epidemiology and biostatistics, or permission of instructor. Introduction to infectious disease epidemiology. Course will focus on methodology, public health concerns, patterns of transmission, and "newly" discovered infections. Will focus on diseases in developed countries, especially the United States. *Three lecture hours a week, fall.* Weber, Weigle.
- EPID 219** **Reproductive Epidemiology** (3). Permission of instructor required. Prerequisites, EPID 160 and BIOS 115, or alternatives. Epidemiology of major reproductive

health outcomes, including infertility, fetal loss, birth weight, congenital malformations, infant mortality. Current knowledge regarding epidemiology of these outcomes; discussion of methodologic issues specific to reproduction. *Fall. Savitz.*

- EPID 222 Epidemiology of Immunizations (3).** Prerequisites, EPID 160 or equivalent. This course will explore the application of epidemiological methods to immunization practices. Topics will include vaccine development, vaccine efficacy, post-licensing evaluation, vaccine coverage and cost/benefit analysis. *Three lecture hours a week, spring. Weigle, Weber.*
- EPID 223 Biochemical Epidemiology (3).** Prerequisites, introductory epidemiology and biostatistics. Introduction to the use of biochemical markers in epidemiologic research. Emphasis will be placed on markers of genotoxicity such as chromosomal aberrations, sister chromatid exchanges, micronuclei and DNA adducts. *Three lecture hours a week, fall. Vine.*
- EPID 224 Methods in the Study and Control of Sexually Transmitted Diseases (3).** Prerequisites, EPID 160 or equivalent. Course aims to familiarize students with current knowledge of epidemiology of sexually transmitted diseases and how to study these diseases. Extensive discussion of issues in the control of STD's. *Three lecture hours a week, spring. Thomas, Waskin.*
- EPID 225 Clinical Trials in Epidemiology (3).** Prerequisites, introductory epidemiology, introductory biostatistics. Systematic overview of principles in design, implementation and analysis of clinical trials. Emphasis on applications in chronic disease epidemiology. In-depth discussion of case examples from cardiovascular disease epidemiology emphasized. *Three lecture hours a week, spring. Tyroler, Davis.*
- EPID 226 Control of Infectious Diseases in Developing Countries (1-3).** Prerequisites, EPID 160 or 168. Orientation to control and study of infectious diseases in developing countries. Principles of planning, conduct, evaluation of field studies/projects; emphasis on infectious diarrheal diseases, vector-borne infections, parasitic diseases. *One lecture hour and 2-4 seminar hours a week, alternate years, spring. Weigle.*
- EPID 228 Health Promotion/Disease Prevention and Behavioral Epidemiology (3).** Prerequisite, EPID 168 or permission of instructor. Selected topics on the role of lifestyle behavior in modern illness and on conceptual, methodologic, substantive, and policy issues in health promotion/disease prevention. *Three lecture hours a week, spring. Schoenbach, Kaplan.*
- EPID 232 Methods and Issues in Pharmacoepidemiology (3).** Permission of instructor required. Prerequisites, introductory level epidemiology and biostatistics. Application of the epidemiologic knowledge, methodology and reasoning to the study of the effects (beneficial and adverse) and uses of drugs in human populations. *Fall. Guess.*
- EPID 233 Cancer Epidemiology and Pathogenesis (3).** Prerequisites, EPID 168 or equivalent, BIOS 105, undergraduate major or strong preparation in the biological sciences. Permission required for nonmajors. Emphasis on integration of epidemiologic data with laboratory and clinical research findings. Issues in epidemiologic research design, analysis and interpretation are presented within the context of substantive epidemiology. *Three lecture hours a week, spring. Hulka, Morris.*
- EPID 249 Genetics of Common Diseases (GNET 249) (3).** Prerequisites, BIOS 150, GNET 122 or EPID 160, or permission of instructor. Critical analysis of genetic issues in human disease. The genetics of cancer, heart disease, diabetes, mental illness, mental retardation, hypertension and arthritis will be covered.

The application of genetic and epidemiological techniques will be examined. *Spring, alternate years.* Swift.

- EPID 256 Cardiovascular Disease Epidemiology (3).** Pre- or corequisites, EPID 160 and BIOS 110, or their equivalents. Review of major issues in cardiovascular disease epidemiology, summarization of relevant pathology and analogies of population determinants and strategies for prevention. *Three lecture hours a week, fall.* Tyroler, Heiss, Davis, Wing.
- EPID 257 Teaching Internship in Epidemiology (4).** Permission of the Chair required. Required of students enrolled in the doctoral program in epidemiology. Outstanding students from other departments eligible if space permits. Provides supervised experience in teaching and course preparation. *Fall, spring and summer.* Faculty.
- EPID 264 Sociocultural Environment and Health (3).** Prerequisites, EPID 160 or equivalent, basic social science background. Permission of instructor required. Selected topics on social and cultural factors in health and illness. *Three lecture hours a week, spring.* Kaplan.
- EPID 266 Epidemiologic Investigation (3).** Prerequisites, EPID 160, EPID 256 and BIOS 110, or their equivalents. Permission of instructor required. A second level course designed for the acquisition of skills in epidemiologic research and the investigation of current issues in cardiovascular disease. Heiss, Davis, Tyroler.
- EPID 268 Theory and Quantitative Methods in Epidemiology (4).** Prerequisites, EPID 168 and BIOS 145. Permission of instructor required. An in-depth treatment of key methodological topics in epidemiology, including concepts of cause confounding and its control subject selection, data quality, sampling variability, and effect modification. *Three lecture and two laboratory hours a week, fall.* Savitz, Loomis.
- EPID 269 Special Topics in Epidemiologic Methods (3).** Prerequisite, EPID 268. Permission of instructor required. A continuation of EPID 268 covering additional methodologic issues. Topics include survival analysis, collinearity, control of error rates, extensions of logistic regression, plus review of selected methodologic literature. *Two lecture hours and two seminar hours a week, spring.* Hertz-Picciotto.
- EPID 276 Environmental and Occupational Epidemiology (3).** Prerequisite, EPID 160 or 168 or equivalent; permission of instructor. Designed for epidemiology majors, this course investigates various applications of the principles of epidemiologic research to the evaluation and identification of environmental and occupational health hazards. *Spring.* Shy.
- EPID 301 Pharmacoepidemiology Seminar (1).** Prerequisites, basic knowledge of epidemiology and biostatistics. This is a weekly seminar to explore current problems in pharmacoepidemiology. It supplements the introductory course Epidemiology 232. May be repeated. *Two seminar hours a week, spring.* Guess.
- EPID 315 Field Training in Epidemiology (3-6).** Prerequisite, advanced standing. Designed to give epidemiology majors a supervised field experience in population health research. *Fall, spring, and summer.* Faculty.
- EPID 325 Cancer Research Seminar (1).** Local cancer researchers will discuss their ongoing research activities and opportunities for students. Students will be responsible for reading background material prior to seminars. *Fall.* Faculty.
- EPID 350 Reproductive Epidemiology Seminar (1-2).** Prerequisites, introductory epidemiology, introductory biostatistics, and EPID 219. Permission of instructor

required. Detailed review of selected topics in reproductive epidemiology. May be repeated for credit. Wilcox, Savitz, Harlow.

- EPID 360** **Research in Epidemiology (2-9).** Prerequisite, permission of instructor. Independent investigation in consultation with an instructor who must assign or approve the subject of research. Credits will vary according to the effort and rigor of the research. *Fall, spring, summer.* Faculty.
- EPID 361**
- EPID 368** **Epidemiology and Health Policy (3).** Prerequisites, basic course in epidemiology and biostatistics. Epidemiology for policies on health services, environment, occupation and pharmaceuticals. Indices/classifications, risk assessment/management, and design/analyses are covered. Weight of evidence, research, government, industry, population, world and media are considered. *Three lecture hours a week, alternate years, spring.* Ibrahim.
- EPID 380** **Hospital Epidemiology (1-2).** Prerequisites, EPID 168 and EPID 218. Permission of instructor required. Comprehensive seminar in hospital infection control. Topics include issues in employee health, surveillance, outbreak investigation, environmental sampling and policy formation. May be repeated for credit. *Two to four seminar hours, fall, spring, summer.* Weber.
- EPID 392** **Master's Paper (1-6).** *Fall, spring and summer.* Faculty.
- EPID 394** **Doctoral Dissertation.** *Fall, spring, and summer.* Faculty.
- EPID 400** **General Registration (0).**



Health Behavior and Health Education

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Julie McQueen
Karen Monaco
Jerrell Moore
Anna P. Schenck
Emily T. Tyler

¹Deceased June 20, 1990

The Department of Health Behavior and Health Education is concerned with the general field of health-related social and behavioral change ranging from the levels of social policy to those of community, family, and individual. It has particular research and practice interests in women's health, patient education, mental health, rural health, international health, adolescent health, ethnic minority health and the health of the elderly.

The Department offers four graduate degree programs and an undergraduate major in Health Behavior and Health Education in the BSPH degree program. General information and details about admission and the undergraduate curriculum are found on page 17 of this catalog and in *The Undergraduate Bulletin*. Students in the program are prepared for entry level positions in health behavior and health education in health and other community agencies and for graduate study in health behavior and health education.

The Master of Public Health degree is the basic qualification for the professional health education specialist. The program of study prepares candidates for professional roles in community development, social action, health promotion and disease prevention, and in domestic and international policy agencies. In general, students are prepared for leadership positions in health education planning, management and evaluation. The focus of the MPH program is on the practice of selecting, applying and monitoring appropriate behavioral, social and political change strategies to enhance people's health.

The general requirements for admission are set forth on pages 20-22. The previous bachelor's degree should include a minimum of four courses in psychology, sociology, anthropology, and/or political science, at least one of these to be an advanced course. The candidate should have a minimum GPA of 3.0 for the junior and senior years. All applicants must take the GRE. Foreign students must also take the TOEFL.

In admission policy, besides the level and relevance of previous academic achievement, special consideration is given to developing a balanced student body recognizing the obligation to state residents and including a mix of individuals with special life or work experience drawn from the United States and foreign countries.

The minimum period of study is four semesters and two summer sessions in continuous full-time residence, admission being only in the fall of each academic year. A minimum of 54 semester hours is required. This includes School of Public Health core courses (e.g., Biostatistics, Epidemiology, etc). Health Behavior and Health Education core and elective courses and field practice.

All students take a common core of departmental courses for the first 12 months. An integrated theory, practice and research methods sequence is organized into learning modules, each of which is planned and taught by a team of faculty. This sequence is complemented by required program planning and management courses. All students are also required to complete a 12 month field practicum which runs concurrently with the course sequence. The field work begins with a community diagnosis conducted by student teams and guided by field preceptors, who are local health education professionals. Subsequently, students work individually with a faculty adviser to design, implement and evaluate an intervention project. The practicum and course modules are sequenced and paced so that students can learn concepts and methods in the classrooms that can be immediately applied in the field.

At the end of the first year, each student must pass a written comprehensive examination. This examination covers theory, practice and evaluation research in health behavior and health education. During the remaining two semesters, students focus on a specialty area. They take elective courses and concentrate on their masters paper. The topic must address a public health problem that has implications for health behavior and health education theory and practice.

The Master of Science in Public Health is a more specialized program of study. Students may specialize in either planning health education and behavior change programs (Track 1) OR in research methods (Track 2). Each track requires 34 credit hours of coursework, an internship, a master's paper and a comprehensive examination to be completed over a 12-18 month period. Enrollment on a full-time basis is highly desirable but not required. Students must matriculate in the Fall semester following admission. Summer session enrollment is not required.

The general requirements for admission are set forth on page 22. In addition, MSPH Track 1, students must have at least 7 years of progressively responsible positions in health education, exclusive of experience gained during school enrollment. Track 1 is for students who need specialization in health behavior and health education planning. For MSPH Track 2 students, special consideration is given to applicants with one or more years of relevant practice or research experience. Track 2 prepares students for midlevel research positions or entry into a doctoral program.

Two doctoral degrees are offered: The Doctor of Philosophy (PhD) and the Doctor of Public Health (DrPH). In the PhD program, emphasis is placed on the behavioral and social sciences, research and theory development, and advanced research methodology. The program is designed primarily for students who intend to do research and teach in academic settings. The DrPH program emphasizes the application of research findings to the solutions of public health problems, policy development, program administration, and program evaluation. This program is most suitable for students who are interested in the administrative, consultative, and evaluative research roles in public health. Four consecutive semesters in full-time residence are required.

Applicants are required to have a master's degree in health behavior and/or health education, one of the social or behavioral sciences, or in any field encompassing comparable training, such as social work, public health administration, or epidemiology. They must provide evidence of competency in public health in general, at least one of the social or behavioral sciences, basic aspects of health behavior and health education, and in the conduct of research.

Department of Health Behavior and Health Education

- HBHE 9** **Freshman Seminar** (3). For freshmen only. A review of the nature of modern health problems and the roles of the individual, the community, the health professions and agencies in medical care and health maintenance. *Fall*. Staff.
- HBHE 50** **Personal and Community Health Behavior** (3). Relation of living habits and practices to health maintenance, disease prevention and use of the health care system. *Spring*. Staff.
- HBHE 90** **Field Training in Health Education** (4). Prerequisite HBHE 103. Experience as a functioning health educator in a community setting under supervision. Field fee, \$100.00. *Fall, spring, summer*. Hatch and staff.
- HBHE 91** **Field Training Evaluation** (2). Pre- or corequisite HBHE 90. Permission of instructor. Evaluation of field practice. Written report required. *Fall, spring, summer*. Staff.
- HBHE 97** **Readings in Health Education** (3-6). Directed readings or laboratory study. Written report required. *Six to twelve hours a week, fall, spring and summer*. Staff.
- HBHE 99** **Honors in Health Education** (3-6). Prerequisite, HBHE 97. Directed research. Written report required. *Six to twelve hours per week, fall, spring and summer*. Staff.

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- HBHE 101** **Aging and Human Development** (PHNU 124/HPAA 124/NUTR 101) (3). Lectures concerned with biological, physical, emotional, demographic and social aspects of aging. Field trips to institutions and home visits. *Fall*. Staff.
- HBHE 102** **Defining Public Health Problems** (3). Permission of instructor. Overview of field of public health; focus on cultural, psychological and social forces that influence health behavior. Treatment of public health principles, theories, and strategies basic to the practice of health education. *Three lecture hours per week, fall*. Jackson.
- HBHE 103** **Implementing and Assessing Health Education** (3) Permission of instructor for non-majors. Focus on core understandings and skills needed to initiate and evaluate practice at the individual, small group and community levels. Topics include support groups, patient education and advocacy. *Three lecture hours per week, spring*. Jackson.
- HBHE 104** **School Organization for Health Education** (3). Permission required for non-majors. Introduction to school health education and administration including components and organization of a comprehensive school health program, curriculum design and evaluation. *Two lecture and two laboratory hours a week, spring*. Barr.
- HBHE 108** **Minority Health and Health Services Delivery** (2). The life experiences of ethnic minorities in the United States with special reference to the implications for their participation in health programs. *Two lecture hours per week, spring*. Hatch.
- HBHE 109** **Rural Health and Community Action** (3). Permission of instructor. Community education and action as modes of intervention in rural communities. Cross-cultural perspectives of rural health development. *Three seminar hours a week, fall*. Hatch.
- HBHE 120** **Promoting Health in a College Setting** (3). Lectures and seminars on planning, implementing and evaluating health education programs in a college setting with an emphasis on health promotion and wellness. *Two lecture, two seminar hours per week*. Staff.
- HBHE 121** **Health Promotion Practicum** (3) Prerequisite, HBHE 120. This field placement in the Student Health Service will provide an opportunity to implement skills learned in HBHE 120. *Nine laboratory hours a week*. Staff.
- HBHE 125** **Injury as a Public Health Problem** (MHCH 125) (3). Pre- or corequisite, EPID 160. This course considers the causes and consequences of traumatic injury within developmental, social and economic contexts and dilemmas in injury prevention. Injuries associated with transportation, violence and the home and occupational environments are included. *Three lectures per week, spring*. Runyan, Kotch.
- HBHE 130** **Social and Behavior Science Foundations of Health Education** (Variable). Permission required for non-majors. Selected social and behavioral science theories and concepts that apply to the analysis of health related behavior and to the generation of intervention strategies. *Three lecture hours per week, 1 seminar hour, fall*. DeVellis.
- HBHE 133** **Interpersonal and Group Relations** (3). Prerequisite, permission of instructor. An experimental study of human relations with emphasis on analysis of interpersonal and group interaction, the effective use of intervention in group problem solving, leadership styles and team building, inter-group cooperation and conflict. *Two lecture, two laboratory hours, spring*. Staff.

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- HBHE 140** **Problems in Health Education** (1 or more). Prerequisites to be arranged with the faculty in each individual case, depending upon the problem that is to be studied. A course for students of public health who wish to make an intensive study of some special problem in public health education. *Fall, spring, and summer.* Staff.
- HBHE 150** **Group Dynamics & Discussion Group Leadership: Human Sexuality** (4). Permission of instructor. Interpersonal and group interaction, theory and practice. Design and application of training exercises. Focus on leadership in group dealing with human sexuality. *Fall, spring.* Staff.
- HBHE 160** **Introduction to Women's Health and Health Education (WNST 161)** (3). Using a lecture-discussion format, this course provides an overview of women's health-specific interests as family and community members, as patients and as health professionals. Implication for health education practice as well as opportunities for future research will be emphasized. *Two lecture and two seminar hours per week, fall.* Earp.
- HBHE 172** **Principles and Practice of Patient Education** (2-3). Principles and practice of implementing, coordinating and evaluating patient education programs. *Two lecture hours per week (3 hour credit will be granted on the basis of a relevant research activity approved by instructor), spring.* Staff.
- HBHE 180** **Mental Health Promotion: Social and Behavioral Change Approaches** (3). Critical review and evaluation of programs targeted at individuals, families, interpersonal networks, communities and larger social units which have the promotion of mental health as a goal. *Three hours per week, spring.* Staff.
- HBHE 185** **Topics in Worksite Health Promotion (PHNU 185)** (3). An overview of critical scientific, political, economic, behavioral and other issues as they affect planning, conduct and evaluation of health promotion/risk reduction programs at the worksite. *Spring.* Staff.
- HBHE 190** **Psychosocial Aspects of Aging** (3). Psychosocial aspects of the aging process and of old age. Needs of the elderly and their reactions to agencies and programs for the aged. *Two lecture and two seminar hours per week, spring.* Mutran.
- HBHE 200** **Special Studies in Behavior Change** (1 or more). Prerequisite, permission of instructor. HBHE 200-natural change process in health-related behavior; **201** HBHE 201-planned change; personal and non-personal methods. HBHE 202- **202** program design and evaluation; HBHE 203-personal development and community action; HBHE 204-social class and culture variations in planned change. *Fall, spring and summer.* Staff.
- HBHE 208** **Units of Practice I: Family and Kinship Systems.** (3). Permission of instructor. The relationship of family and kinship patterns to health behavior; implications for planned change. Staff.
- HBHE 209** **Units of Practice II: Individual, Small Group and Network** (1-3). Corequisite, enrollment in HBHE 241, or permission of instructor. Behavior systems in the individual, small group, family and other styles for planned change in personal health-related behavior, interpersonal and non-personal methods. *Fall and spring.* Staff.
- HBHE 210** **Units of Practice III: The Community** (1-3). Corequisite, enrollment in HBHE 241, or permission of instructor. The nature and delineation of communities as social systems; theories, principles and practices relevant to health-related community development process; the identification of formal and informal leadership and power structures, etc. *Two lecture and seminar hours per week, fall, spring and summer.* Eng.
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- HBHE 211** **Units of Practice IV: Social Policy and Large Populations** (1-3). Health education social policy roles and strategies. The nature and delineation of policy and large populations as units of health education practice; include field practicum. *One-three seminar, one-three laboratory hours per week, spring, alternate years.* Steckler, Dawson.
- HBHE 212** **Citizen Participation in Community Health Decision Making** (1-4). Permission of instructor. Theories and concepts of citizen participation in community health settings; an historical review of mandated citizen participation; and strategies for enhancing citizens' ability to influence the social policy process. *One-three lecture hours; 0-two seminar hours per week, fall.* Steckler.
- HBHE 215** **Natural Change Determinants in Health-Related Behavior.** (3). Permission of instructor. An intergrated behavioral science approach to unplanned determinants of change in the health related behavior systems of the small individual, group, and community. *Fall.* Staff.
- HBHE 216** **Cultural, Health and Planned Change** (3) The relationship between effective planned health related behavioral and social change and cultural systems are explored. *Fall.* Staff.
- HBHE 218** **Planning Family Health Programs** (PHNU 246, MHCH 246, HPAA 246) (3). Basic models and methods of program planning. Emphasis on application of methods through the development of program plans for significant family health problems. *Three lecture hours per week, spring.* Peoples-Shep.
- HBHE 222** **Professional Practice** (1 or 2). Corequisite, enrollment in HBHE 242 or permission of instructor. Studies in the professional role of the change agent and consultant with special reference to cross-cultural settings; the development of the professional and sources of innovation and practice. *Fall.* Dawson.
- 223**
- HBHE 230** **Public Policy and Health Promotion** (HPAA 262) (3). The course objectives are to identify an ecological view of modern health problems and its implications for health policy development and analyze the effectiveness of major health promotion strategies. *Spring.* Milio.
- HBHE 231** **Cross-Cultural Consultation** (3). Permission of instructor; corequisite, HBHE 243. The process and content of cross-cultural and international consultation in technical assistance to developing country health programs with special reference to planned social and behavioral change. *Fall.* Staff.
- HBHE 232** **Health, Development and Technology** (3) Critical analysis of the theories in and approaches to adult learning, economic development, technology transfer, and primary health. The course includes a review of non-formal education and community organization techniques as tools for integrating health and development in the rural U.S. and in developing countries. *Fall.* Eng.
- HBHE 233** **Introduction to Program Management** (2). An introductory overview of health education program management. A practical study of personnel and financial management issues including: staff development, recruitment, performance appraisal, budget preparation and monitoring. *Six lecture hours per week, summer.* Dawson and House.
- HBHE 234** **Team Problem Solving** (1 or more). Prerequisites, HBHE 133 or permission of instructor. An experimental study of interpersonal relations in professional team settings; intra- and inter-team relationship process to large social systems with emphasis on intervention techniques. *Spring.* Staff.
- HBHE 235** **Instructional Materials and Development** (1-3), Permission of instructor. Independent projects in the design, production, validation and utilization of self-instructional training materials for use in college courses, in-service training
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programs, patient education, etc. Students may arrange for credit proportionate to the complexity of the individual projects. *Fall and spring.* Staff.

- HBHE 240** **Community Diagnosis and Needs Assessment** (3). Co-requisite, HBHE 130. Purpose and methods for conducting community diagnosis, needs assessment and descriptive research in health education practice. Student teams work under field preceptors to apply these methods for subsequent problem formulation and evaluation. *Three lecture hours per week, fall.* (Field fee, \$450.00.) Dawson.
- HBHE 241** **Program Intervention Design and Evaluation** (Variable). Co-requisite HBHE 250. Introduction to social and behavioral change models for designing, evaluating, and institutionalizing health education interventions. Students work under faculty advisers to develop an intervention plan in partnership with client communities and agencies. *Three lecture hours per week, spring.* Dawson.
- HBHE 242** **Program Intervention, Implementation and Monitoring I** (2). Prerequisite, HBHE 241, co-requisite, HBHE 251. Methods for executing health education intervention plans, including monitoring effectiveness and making appropriate modifications. Students work under faculty advisors to collaborate with local agencies and implement the plan of action developed in HBHE 241. *Six lecture hours per week, summer.* Dawson.
- HBHE 243** **Program Intervention, Implementation and Monitoring II** (2). Pre-requisite HBHE 242, Co-requisite, HBHE 252. Application of methods to analyze and interpret data regarding the effectiveness of health education interventions. Students work under faculty advisers to assess the effectiveness of interventions implementation in HBHE 242. *Six lecture hours per week, summer.* Dawson.
- HBHE 250** **Evaluation and Research Methods in Health Education** (4). Permission of instructor for non-majors. Research and evaluation methods of relevance to planned change in health-related behavior and program planning. Research designs will include quantitative and qualitative methods and will focus on application to public health practice. *Four lecture hours per week, spring.* Mutran.
- HBHE 251** **The Role of Evaluation in Health Education** (2). Prerequisite HBHE 250. Emphasis on methods to show the importance of evaluation in health education program planning and developing skills in formative evaluation design, emphasizing analysis that contributes to decision making regarding programs. *Six seminar hours per week, summer.* Strecher.
- HBHE 252** **Presenting Research Results in Professional and Community Settings** (1). Prerequisite, BIOS 110 and HBHE 250 or equivalents. A practical introduction to methods of presenting health information and research results to professional and lay persons in community settings. Lectures and readings present techniques for writing scientific abstracts, making oral presentations to professional colleagues, and presenting health information to the media. Students will also learn PC to produce a newsletter and poster presentation of their own research. *Three lecture hours per week, summer.* Headen.
- HBHE 253** **Qualitative Evaluation and Research Methods** (3). Prerequisite HBHE 250 or equivalent. Philosophy of qualitative evaluation and research studies. Collecting and analyzing qualitative data through participant observation, interviewing, group methods and case studies. *Three lectures per week, fall.* Steckler.
- HBHE 254** **Personnel Development** (1-3), Corequisite, enrollment in HBHE 234, or permission of instructor. The study of training and supervision as processes for personnel development in programs of planned change; training system strategies,
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- design, teaching styles, methods and evaluation; the personnel development role in supervision, effects of organizational climate, etc. *Fall and summer.* Staff.
- HBHE 300** **Social Psychological Theories of Individual Health Behavior** (3). Prerequisite HBHE 130 or permission. Selected social psychological theories and their relationship to health promotion, disease prevention and patient education. *Three lecture hours per week, spring every other year.* DeVellis.
- HBHE 301** **Sociological Theories and Health** (3). Permission of instructor. This seminar reviews selected sociological theories and their relationships to public health, health behavior and health education. *Three seminar hours per week, spring alternate years.* Bauman.
- HBHE 310** **Doctoral Seminars in Health Education** (1-3), Prerequisite master's degree.
to
317 Permission of instructor for non-majors. A series of seminars designed to explore the scientific foundations of health education and their implications for health education practice. *Two to six seminar hours a week, fall, spring and summer.* Staff.
- HBHE 340** **Field Training in Health Behavior and Health Education** (3). Permission of instructor. Under guidance by faculty and field counselors, students assume major responsibility for intervention and research practice projects. Open only to doctoral and MSPH students in the Department. Field fee \$125 per semester. *Fall.* Dawson.
- HBHE 341** **Advanced Field Training in Health Education** (1-3). Under guidance by faculty
342 and field counselors, students assume major responsibility for planning,
343 executing, and evaluating community health education projects. Open only to doctoral students in the Department. Field fee \$125 per semester. *Fall and spring.* Dawson.
- HBHE 350** **Secondary Data Analysis** (3). Prerequisite BIOS 145 or equivalent. Permission of instructor. This seminar is designed to refine a wide range of research skills in health behavior and health education by using data collected by others. *Three seminar hours per week, spring alternate years.* Bauman.
- HBHE 351** **Causal Modeling and Structural Equations** (3). Prerequisite BIOS 145 or equivalent. Permission of instructor. Focus on causal modeling and strategies for analyzing such models including LISREL analysis. Secondary data will be available for course assignments. *Three lecture hours per week, spring alternate years.* Mutran.
- HBHE 352** **Scale Development Methods** (3). Prerequisite HBHE 250 or equivalent. Permission of instructor. Covers theory and application of scale development techniques for measuring latent constructs in health research. Classical measurement theory and factor analytic methods are emphasized. *Three seminar hours per week, spring.* DeVellis, R.
- HBHE 353** **Advanced Evaluation of Health Intervention Programs** (3). Prerequisites BIOS 145, HBHE 250, HBHE 251 or equivalents. Permission of instructor. Emphasis is on methods required to complete various types of analysis related to program implementation (e.g., efficacy of program in terms of objectives, cost-benefit analysis, utility analysis). Both quantitative and qualitative methods will be covered. *Three seminar hours per week, fall.* Earp and Strecher.
- HBHE 392** **Master's Paper** (1-6), *Fall, spring and summer.* Staff.
- HBHE 394** **Doctoral Dissertation** (3-9), *Fall, spring and summer.* Staff.
- HBHE 400** **General Registration** (0).



Health Policy and Administration

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Kit N. Simpson
Sally C. Stearns

¹Deceased November 14, 1989

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Robert B. Moorhead
Associate Dean
Ernest A. Schoenfeld
Associate Dean

The Department of Health Policy and Administration offers educational programs at the undergraduate, master's, doctoral, and postdoctoral levels. Each of these programs has special characteristics.

The Undergraduate Program. The undergraduate program (BSPH degree) prepares students for entry-level positions as managers of small facilities, as administrators of units within larger facilities, and for a variety of staff positions in health and health-related organizations. In addition, the program prepares students for graduate study in the health professions or related professional programs such as business, law, or medicine. For further information about this program contact Professor Patricia Z. Barry, Director, Undergraduate Program.

Residential Master's Programs. The Department offers three master's degree programs: the Master of Public Health (MPH), Master of Healthcare Administration (MHA), and Master of Science in Public Health (MSPH).

The MPH degree requires 12 months of full-time studies in residence in Chapel Hill. Only those who hold doctoral degrees (MD, DDS, JD, PhD., etc.) or are enrolled in such degree programs are accepted. The MPH degree is designed to provide health professionals and scholars with a comprehensive understanding of public health philosophy and values and to develop competence for managerial and policy roles in the field of public health and related areas. Those interested in board certification in preventive medicine and public health dentistry should pay special attention to this degree.

The MHA degree program provides concentrated study in health care administration, while the MSPH degree program provides for concentration in health policy. Although the minimum qualification for admission to the MHA and MSPH programs is a bachelor's degree from an accredited college or university, those with graduate and professional degrees (MD, DDS, JD, etc.) should also give serious consideration to these degrees because of their high quality and rigor. All students admitted for these degrees are expected to have proficiency in microeconomics, mathematics, and accounting. The programs are 21 months in duration. The first year consists primarily of required courses; most of the second-year courses are elective. Students also select an area of further specialization, such as policy analysis, health economics, financial management, quality management, marketing, or international health. For further information on the residential master's degree programs, contact the director of the Master's Program.

Conjoint Degree Programs. By special arrangement, master's degree programs may also be pursued simultaneously with several other degrees. The following com-

bined degree arrangements have been developed: MD/MPH, DDS/MPH, JD/MPH, and PhD/MPH. Interested students should contact the Department for further details.

Executive Master's Program. The Department also offers two executive MPH degree programs designed for employed health professionals and health administrators. There are two areas of concentration: management and dental public health. The minimum requirements for admission are a bachelor's degree from an accredited college or university, and three years of clinical and/or administrative experience in a health care setting.

The *Off-Campus Program* provides instruction one day a week during the regular academic year at sites accessible to students in western and eastern North Carolina. This program is offered on a three-year cycle. The *Regional Master's Degree Program* provides instruction through a combination of six-week summer school sessions, integrated residential and nonresidential courses, and course transfer options, to reach health administrators over a wider geographic area. A new class is accepted each year in this program. The curriculum, faculty, examinations, standards, and other expectations for both the Off-Campus Program and Regional Degree Program are the same as of students in the residential MPH program. For additional information write to Professor James V. Porto, Director, Executive Programs.

Doctoral Programs. Studies for the doctoral degree are organized in two tracks: PhD and DrPH. The PhD and DrPH programs are built on a series of core courses in the major field of health policy and administration.

The PhD degree requires (a) a disciplinary area in which a formal minor is designated, such as sociology, political science, finance, economics, demography, or epidemiology; and (b) a dissertation in health policy and administration that is based on, proceeds from, and contributes to applicative knowledge in the disciplinary field.

The DrPH degree (a) provides for an eclectic but necessary series of collateral courses directly relevant to the identified area of dissertation research, and (b) requires a dissertation involving application of multidisciplinary approaches to the investigation of a problem in health policy and administration. Individuals interested in the DrPH degree should contact the director of the Doctoral Program.



The Department has a special collaborative arrangement for doctoral studies with the School of Pharmacy for students with background in pharmacy administration.

In addition to the minimum admission requirements, a master's degree in public health with emphasis in health services and administration, or an equivalent degree from an accredited university is required. Students entering the program are also expected to have completed, or to complete during doctoral study, the equivalent of one year of graduate-level statistics, a course in health program planning and evaluation, a course in the U.S. health system, a course in environmental health, and a course in epidemiology. Under special circumstances, students enrolled in the Health Policy and Administration MSPH, MHA, or MPH programs of study may transfer to the PhD program after successful completion of one year of study. For further information contact Professor James E. Veney, Director, Doctoral Program.

Visiting Scholars Program. The appointment as a Visiting Scholar is given for a minimum of one semester to a maximum of three years. Visiting Scholars need not have a doctoral degree for they are accepted primarily on the basis of their professional status rather than academic credentials. For further information contact Professor Kerry E. Kilpatrick, Chair, Department of Health Policy and Administration.

Detailed information on the various programs of study, curricula, faculty, admissions requirements, financial assistance, and other matters is available from the Department of Health Policy and Administration.

Department of Health Policy and Administration

- HPAA 70** **Introduction to Health Services Systems (3).** Corequisite HPAA 71. Permission required except for HPAA and HBHE majors. An introduction to the current status, trends, practices and issues in the delivery of health services. *Fall.* Staff.
- HPAA 71** **Orientation to Health Services Organizations (1).** Corequisite HPAA 70. Permission required except for HPAA and HBHE majors. Opportunities for those with limited exposure to health-related organizations to visit several operating agencies, as an approach to understanding the U.S. health system. *Fall.* Chavious.
- HPAA 73** **Management of Human Resources (3).** Permission required for non-HPAA majors. General introduction to the broad field of human resource management in health organizations in the U.S. Detailed treatment of selected topics with a view to help develop operational skills. *Spring.* Clay.
- HPAA 75** **Foundations of Health Care Financial Management (3).** Prerequisite BUSI 71. Permission required for non-BSPH students. Basic methods and techniques in financial management of health care programs including financial statement analysis, cost determination and allocation, pricing of services and budgeting. *Spring.* Porto.
- HPAA 83** **Introduction to Health Organization Structure, Functions, and Design (3).** Senior standing, or permission of instructor. Basic concepts of organization structure, functions, and design, and relevant administrative behavior, as applied to health and human services organizations. *Fall.* Files.
- HPAA 85** **Computers in Health Administration (3).** Permission of instructor required. The purpose of this course is to provide the student with a general introduction to the theory and to the major applications of computers, especially microcomputers. *Fall, spring.* Porto.

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- HPAA 91** **Readings in Health Policy and Administration (3–6).** For undergraduates enrolled in the department's bachelor's degree program. Permission of instructor required. Directed readings or research; written reports are required. *Fall, spring, summer.* Staff.
- HPAA 98** **Field Training in Health Policy and Administration (1–6).** Prerequisite, HPAA majors only. Orientation to health services organizations, under faculty supervision. Relevant to SPH course work in all majors; can contribute to development of acceptable plans for summer internships. Field fee \$200. *Fall, spring, summer.* Barry.
- HPAA 99** **Honors Research (6–9).** Prerequisites, overall GPA 3.3. by end of junior year in all UNC-CH courses, permission of department chair. Readings and seminars for undergraduates who show potential and talent to do research. Students will carry out a special project and prepare an honors thesis based on the project. *Fall, spring, summer.* Staff.
- HPAA 101** **Information Management in Health Policy and Administration (1).** Introduces students to methods for critically evaluating public health literature and using computers to identify, file, and retrieve information. *Fall.* Moore, White.
- HPAA 102** **Concepts of Health Administration (3).** Survey of health and human services organization and management, including concepts of administrative systems, government, legal and public interest aspects, organizational behavior and relations. *Spring.* Allen.
- HPAA 104** **Issues in Managing Health Care Organizations (VAR).** Through presentations of leaders in the health care field and class discussion, problems, issues, and changes in health care policy and administration will be explored. *Spring.* Porto.
- HPAA 105** **Issues in Health Policy (3).** Lectures on current topics in the area of health policy. *Spring.* Staff.
- HPAA 106** **Issues in Health Care (1–2).** Lectures on current topics in the area of health policy. *Fall, spring.* Staff.
- HPAA 107** **Theory and Practice of Public Health Policy and Administration (3).** Policy and management issues and ideals, including their historical derivations and international implications, in relation to current state and local practice. *Fall, spring.* Staff.
- HPAA 109** **Concurrent Field Training in Health Policy and Administration (1-3).** Supervised observation of service activities in health service organizations. *Fall and spring.* Staff.
- HPAA 110** **International and Comparative Health Administration (3).** Permission of instructor required. International career interests desirable. Study of various health problems and responsive program systems in different (more or less developed) countries, with a comparative framework, examining special experiences, general lessons, and possibilities for cooperation. *Fall.* Bender, Freymann.
- HPAA 121** **Hospital Organization and Administration (3).** Comprehensive overview of general hospitals, including organizational structure, governance, medical staff, external relationships, departmental organization, strategic planning, financing, regulation, accreditation, quality assessment. Addressed from perspective of the chief executive officer. *Fall.* Staff.
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- HPAA 122 **Long Term Care Administration I** (3). Introduction to administration of long term care facilities. Evolution of long term care, survey of the current field. Examination of state and national requirements. *Spring*. Allen.
- HPAA 123 **Long Term Care Administration II** (3). Prerequisite, HPAA 122 or permission of instructor. Nursing home care, organization monitoring, costs, and financing. Exploration of trends and issues such as cost controls, productivity, quality assurance, medical staffing and organization. *Fall*. Allen.
- HPAA 124 **Aging and Human Development** (3). (HBHE 101/NUTR 101/PHNU 124) Lectures concerned with biological, physical, emotional, demographic and social aspects of aging. *Spring*. Staff.
- HPAA 127 **Introduction to Dental Public Health** (3). Permission of instructor required. Survey of the theory and practice of dental public health with an emphasis on basic knowledge and skills necessary for planning and evaluating dental public health programs. *Fall, spring*. Rozier, Bader, Graves.
- HPAA 130 **Organization Design and Behavior of Health Institutions** (3). Overview of organizational theory and empirical findings appropriate to the design and behavior of health care organizations. Topics include the design of the organization, its performance and relationship to the environment. *Spring*. Kaluzny.
- HPAA 138 **Dispute Resolution in Health Care Settings** (3). This course covers conflict management and dispute resolution in health care organizations. Listening skills, assertiveness, principled vs. positional bargaining, distributive and integrative bargaining, mediation, handling inter-group conflict. *Spring*. Barry.
- HPAA 139 **Development of Personal Effectiveness** (3). Permission of instructor required. Based on the assumption that personal effectiveness depends on being able to think clearly, this course encourages the development of rational thinking through understanding the relationship between thinking and feelings. *Spring*. Barry.
- HPAA 140 **Readings in Health Policy and Administration** (1-6). Staff.
- HPAA 141 **Marketing for Not-For-Profit Organizations** (3). Permission of the instructor. Application of basic principles of marketing and marketing decision models to problems in health care and other not-for-profit organizations. *Spring*. Parker.
- HPAA 144 **Some Quantitative Methods of Planning and Evaluation** (3). (BIOS 124) Planning cycle, methods overview, data sources, PERT budgeting, health indices, measurement of goal fulfillment, achievement, efficiency, effectiveness, research designs, benefit cost analysis, probability, utility and decision trees. *Spring*. Staff.
- HPAA 145 **Community Health Planning and Evaluation** (3). Covers concepts, history and issues of planning including applications involving community and comprehensive health planning, strategic planning and policy analysis, and methods and techniques of health planning. *Spring*. Parker.
- HPAA 155 **Introduction to Management Information Systems in Health Care** (3). Conceptual and practical aspects in the analysis, development, and utilization of computer-based information and control systems with emphasis on application to the health care environment. *Spring*. Schreiner.
- HPAA 161 **Strategies for Prevention** (3). This course discusses the effects of public policies for prevention on rates of illness, injury, and premature death. *Fall*. Barry.
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- HPAA 163 Geriatric Health and Medical Care (3).** Presents a comprehensive survey of geriatric health and medical care from both a clinical and policy perspective. *Spring.* Staff.
- HPAA 164 Health Policy and Aging (3).** Critical examination of aging policy in light of empirical findings on the elderly's economic power. Utilization patterns, prevalence of dependency, and the cost-effectiveness of policy options, including long-term care. *Fall.* Staff.
- HPAA 165 Women in Healthcare Management (3).** Analysis of current status of women in management in corporate health and governmental settings in the U.S. *Fall and spring.* Allen, Barry.
- HPAA 170 Economic Perspectives in Health Policy and Administration (3).** Prerequisite, ECON 10, or permission of instructor. An introduction to health economics principles as applied to major sectors of the U.S. healthcare delivery system. *Spring.* Kilpatrick, Thorpe.
- HPAA 180 Health Law (3).** The law and the legal decision-making processes and their relationship to the delivery of health services. *Fall, spring.* Staff.
- HPAA 185 Ethical Issues (3).** Nature of ethical thought and reasoning; contributions of religion and science; historical and current issues. Sections on professional practice issues and health policy issues. *Fall.* Allen.
- HPAA 201 Research Methods in Health and Health Services (3).** Prerequisites, BIOS and passing qualifying mathematical examination in HPAA. Examination of available methodology in terms of its application to researchable problems in health administration. Provides directed supervision of students carrying out empirical research. *Fall.* Luckey.
- HPAA 209 Field Work in Health Policy and Administration (1).** Prerequisite, HPAA major. Supervised field experience in approved health agencies. Field fee is \$450.00. *Fall, spring, and summer.* Staff.
- HPAA 210 Working in International Settings (3).** Prerequisite, HPAA 110, or permission of instructor. Using exercises, simulations, cases and field studies, the course aims at developing cultural sensitivities and skills for effective functioning overseas. *Spring.* Jain.
- HPAA 211 Population Policy and Program Development (3).** Prerequisites, BIOS 170, SOCI 212 or equivalents, or permission of instructor. Population policy concepts and processes; policy implications of population dynamics; program implementation issues; especially family planning program strategies, design and evaluation; relating to USA and developing countries. *Fall.* Freymann.
- HPAA 212 International Cooperation in Health and Population (2).** Prerequisite, HPAA 110 or equivalent, or permission of instructor. Roles, problems, opportunities for different kinds of international organizations in health and population fields. Reference to general development context, organizational relationships, various subject areas, and methods of cooperation and assistance. *Spring.* Freymann.
- HPAA 220 Evolution, Organization, and Financing of the U.S. Health System (3).** The course objectives are to provide students with basic knowledge of trends, issues, and existing systems of health care delivery within the U.S. *Fall.* Allen, DesHarnais.
- HPAA 221 Organization and Administration of Multihospital Systems (3).** Prerequisite, HPAA 121 or permission of instructor. Legal, financial, and organizational issues of multihospital systems development and management, including issues
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of corporate reorganizations, strategic planning, and marketing. Prototypes and operating examples will be considered. *Spring*. Staff.

- HPAA 222 Ambulatory Care (3)**. Prerequisite, HPAA 220. Major policy issues in primary care and managed care. Emphasis on practice management, rate setting, contracting, utilization control and quality assurance as case issues for management. *Spring*. Huntley.
- HPAA 223 Management of Non-Profit Organizations (3)**. Principles and advanced topics in the management of non-profit organizations. *Spring*. McLaughlin.
- HPAA 227 Dental Public Health Practice (3)**. Prerequisite, permission of instructor. Emphasis on knowledge of community measures for prevention and control of oral diseases, understanding the scientific basis for their use, and designing and evaluating prevention programs for a specific population. *Spring*. Weintraub.
- HPAA 228 Oral Epidemiology for Health Policy and Administration (3)**. Prerequisites HPAA 167 and EPID 160. Permission of instructor required. Focuses on the epidemiology of oral disease and implications and uses of this knowledge for dental health policy making and administration of dental programs. *Spring*. Rozier, Graves.
- HPAA 230 Management of Human Resources in Health Organizations (3)**. Prerequisite, HPAA 130 or equivalent, or permission of instructor. Emphasis is on clarifying concepts of human resources management and identifying the importance of human resources in health organizations. *Fall*. Jain.
- HPAA 231 Organization Assessment and Diagnosis (3)**. Prerequisite, HPAA 130 or equivalent. This course will explore alternative models and approaches for assessing structural and process characteristics of health service organizations. *Fall*, alternate years. Staff.
- HPAA 232 Interorganization Theory and Behavior (3)**. Prerequisite, HPAA 130 or equivalent. Theory and methods for studying the structure and dynamics of interorganizational relationships in health, mental health and social service settings. *Spring*. Morrissey.
- HPAA 233 Management of Organizational Change (3)**. Prerequisite, HPAA 130 or equivalent. The objective of this course is to improve competence in analyzing health organizations and managing planned change. *Spring*. Files.
- HPAA 240 Health Administration and Planning (3)**. Permission required for non-majors. This course provides an overview of the concepts, processes and methods used in policy analysis, strategic planning, and management in the health care sector. *Fall*. Simpson, Parker.
- HPAA 241 Introduction to Operations Research for Healthcare Systems (3)**. Prerequisite or corequisite, BIOS 110, or permission of instructor. Introduction to the systems analysis process in healthcare systems. Deterministic and random models, mathematical programming, queueing, simulation, forecasting, and measurement. Emphasis on model formulation and computer solution of decision models. *Fall*. Kilpatrick.
- HPAA 242 Advanced Optimization Methods in Health Policy and Administration (3)**. Prerequisite, HPAA 241, or permission of instructor. Analysis of complex deterministic models and their applicability to health services research. Formulation of models for solving health care problems, involving mathematical programming, and heuristics. *Spring*. Parker.
- HPAA 243 Stochastic Processes in Health Policy and Administration (3)**. Prerequisite, HPAA 241, or permission of instructor. Modeling and analysis of random

processes in healthcare systems. Markov and queueing models, simulation of complex stochastic systems, experimental design and output analysis. *Spring*. Kilpatrick.

- HPAA 244** **Advanced Quantitative Methods in Health Policy and Administration (3)**. Prerequisite, HPAA 241, or permission of instructor. Analysis and application of advanced management science models to health and public sector problems. Emphasis is given to advanced forms of mathematical programming, networks, decision theory, and queueing. *Spring*. Staff.
- HPAA 245** **Program Evaluation (3)**. Prerequisite, HPAA 241, or permission of instructor. Concepts and methods of the program evaluation paradigm as applied in health administration; experiential learning of evaluation planning, design, and implementation. *Spring*. Veney.
- HPAA 250** **Introduction to Health Care Financial Management (3)**. Permission required for non-majors. A broad introduction to financial concepts, issues, tools, and vocabulary. Topics include: financial statement analysis, working capital management, budgeting, cost finding, and rate setting. *Fall, spring, and summer*. Zelman.
- HPAA 251** **Management Accounting for Health Administrators (3)**. Prerequisite, HPAA 250, or permission of instructor. Covers selected topics in managerial accounting applied to health care. It is intended to provide in-depth coverage of managerial topics introduced in HPAA 250. *Spring*. Zelman.
- HPAA 252** **Financial Management of Health Care Organizations (3)**. Prerequisite, HPAA 250. Advanced financial management concepts and practices in health service organizations, including: working capital management, capital markets, capital structure, capital budgeting, and reimbursement implications. *Fall*. Staff.
- HPAA 260** **Introduction to Health Policy and Politics (3)**. This course addresses the major political institutions and policy processes that shape health policy, principally at the federal level. *Fall*. Ricketts, Thorpe.
- HPAA 261** **Current Issues in Health Policy and Mass Communications (NURS 356). (2-3)**. Prerequisite, permission of instructor. Provides an analytic skill in a real world context for those who will participate in the broad process of policy formulation through their positions in the health professions and mass communications field. *Fall*. Milio.
- HPAA 262** **Public Policy and the Politics of Health (HBHE 230) (3)**. The course objectives are to identify an ecological view of modern health problems and its implications for health policy development and analyze the effectiveness of major health promotion strategies. *Spring*. Milio.
- HPAA 263** **Quality and Utilization Management (3)**. Prerequisite, HPAA 220. Evolution and current status of health care quality management systems and programs for utilization control. Includes discussion of alternative quality assurance methods; hospital accreditation; government programs. *Spring*. DesHarnais.
- HPAA 264** **Methods of Quality Control in Health Care (3)**. Prerequisite, HPAA 220. Methods and practices for equality control and assurance in health care organizations. *Spring*. Simpson.
- HPAA 266** **United States Health Policy (MHCH 266) (2-3)**. Examination of policy issues pertaining to delivery of health services in the U.S. Evolution and current developments are examined in an effort to evaluate the administrative implications of current and proposed systems of health delivery in the U.S. *Fall, spring*. Miller.

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- HPAA 270 **Health Economics for Policy and Administration (3)**. Prerequisite, BIOS 110, and permission of instructor for non-HPAA students. Provides training in the theory of health economics, and applies this theory to important issues in health policy and administration. *Spring*. Rice, Stearns.
- HPAA 270L **Microeconomics Laboratory (1)**. Corequisite, HPAA 270, and permission of instructor for non-HPAA students. A brief summary of microeconomic theory used in Health Economics for Policy and Administration (HPAA 270). *Spring*. Staff.
- HPAA 271 **Methods for Policy Analysis (3)**. Prerequisite, HPAA 270, or permission of instructor. The purpose of this course is to familiarize the student with the tools of policy analysis, and to provide hands-on experience in using quantitative policy tools. *Fall*. Rice, Stearns.
- HPAA 273 **Structural Equation Models (SOC1 209) (3)**. Prerequisite, SOC1 208 and permission of the instructor. Specification, identification, and estimation of structural models. Attention to regression analysis and its extensions, multiequation modeling and models with unobserved variables and measurement error. Exploratory and confirmatory factor analysis. *Fall*. Bollen.
- HPAA 274 **Analysis of Categorical Data (SOC1 211) (3)**. Prerequisite, permission of instructor. Introduction to techniques and programs for analyzing categorical variables and nonlinear models. Special attention is given to decomposition of complex contingency tables, discriminant function analysis. Markov chains, and nonmetric multidimensional scaling. *Spring*. Bollen.
- HPAA 275 **Analytic Techniques in Health Policy and Administration (3)**. Prerequisite, BIOS 110 and permission of instructor. Covers a variety of analytic techniques and methodologies basic to more advanced analysis of decision problems in health administration. *Fall*. Parker.
- HPAA 276 **Research Management and Ethics in Health Policy (1)**. A seminar on managing research (managing people, money, time, etc.) and dealing with the full range of ethical issues relevant to conducting research. *Spring*. Brooks.
- HPAA 280 **Legal Problems in Health Facility Administration (2)**. Prerequisite, HPAA 180. Readings, cases and discussion of the legal and ethical aspects of delivery of health care services in the hospital setting. *Spring*. Gilbert.
- HPAA 285 **Ethical Issues in Health Policy and Administration (3)**. Prerequisite, HPAA 260, and permission of instructor. The course considers ethical issues arising in current health policy. Some of the topics to be considered are abortion and sex education, the rights and treatment of seriously defective newborns, etc. *Fall*. Staff.
- HPAA 311 **Advanced Studies in Population Policy and Programs (3)**. Prerequisite, HPAA 211 and permission of instructor. Individualized studies on special problems in population policy analysis and development to provide skills in aspects of goal identification, analyzing relevant organizational processes. *Spring*. Freymann.
- HPAA 330 **Doctoral Seminar in Organization Theory and Health Service Organizations (3)**. Prerequisite, doctoral standing and HPAA 130 or equivalent, permission of instructor. Review and application of selected developments in organization theory to health services research. *Fall*. Kaluzny.
- HPAA 350 **Managerial Topics in Health Care Financial Management (3)**. Prerequisite, HPAA 250, permission of instructor. Course brings together organizational, financial, and marketing concepts. Master's students are required to apply concepts to an actual organization by developing a business/marketing plan. *Fall*. Zelman.
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- HPAA 351** **Topics in Health Care Finance (3).** Prerequisite, HPAA 250, permission of instructor. Analysis of topics of current interest in financial management of healthcare organizations. May include project selection, endowment stewardship, access to capital. *Spring.* Staff.
- HPAA 360** **Policy Seminar in Health Policy and Administration (1-6).** Seminar on policy issues in health policy and administration. *Fall and spring.* Staff.
- HPAA 370** **Structural Equation Models with Unobserved Variables (SOC1 317) (3).** Prerequisites, HPAA 332 or SOCI 209, and permission of instructor. This course is an introduction to general structural equations. "LISREL" models, classical econometric/regression models and confirmatory factor analysis models are shown to be special cases of the general model. The specification, identification, estimation, and assessment of fit of these models are discussed. *Spring.* Bollen.
- HPAA 371** **Advanced Methodology in Health Policy and Administration Research (3).** Prerequisite, HPAA 336, permission of instructor. Research methodology as applied to understanding problems in health care delivery. Topics will include simultaneous equation models, factor analysis, limited dependent variables, and an introduction to event history analysis. *Fall and spring.* Stearns, Veney.
- HPAA 372** **Advanced Topics in Health Economics I (3).** Prerequisite, HPAA 270. This course provides a detailed assessment of current health policy issues from an economics perspective. Potential topics include cost-effectiveness analysis, health insurance, etc. *Fall and spring.* Rice, Stearns, Thorpe.
- HPAA 373** **Advanced Topics in Health Economics II (3).** Prerequisite, HPAA 270, HPAA 372. This course is a continuation of HPAA 372 in providing detailed assessment of current health policy issues from an economics perspective. *Fall and spring.* Rice, Stearns, Thorpe.
- HPAA 390** **Advanced Concepts and Applications in Health Policy and Administration (3).** Corequisite, graduate standing in HPAA and completion of master's core. Integrating and building upon the HPAA master's core, this comprehensive course focuses on organization policy-making and administration from the perspectives of the CEO and top management. *Spring.* Files.
- HPAA 392** **Master's Paper (0-3).** *Fall, spring, and summer.* Staff.
- HPAA 393** **Master's Thesis (1-6).** Staff.
- HPAA 394** **Doctoral Dissertation (0-9).** Staff.
- HPAA 395** **Doctoral Seminar in Health Policy and Administration I (3).** Prerequisite, doctoral standing. Readings and discussion of various aspects of health services. Special emphasis is given to the interrelationships of administrative and organizational theory to selected health service topics. *Fall.* Veney.
- HPAA 396** **Doctoral Seminar in Health Policy and Administration II (3).** Prerequisite, HPAA 395. Continuation of Health Policy and Administration 395. *Spring.* DesHarnais.
- HPAA 397** **Selected Topics in Health Policy and Administration: Advanced Seminar (3).** Prerequisite, permission of instructor. Integrative study of selected theory and research as it relates to the organization and delivery of health services. *Fall and spring.* Veney.
- HPAA 398** **Seminar in Teaching Health Policy and Administration (3)** Problems and processes of teaching health policy and administration, including supervised practicum experience. *Fall and spring.* Staff.
- HPAA 400** **General Registration (0).** Staff.
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Maternal and Child Health

Chair

Milton Kotelchuck
Associate Professor

Registrar

Sue F. Ellington
Telephone No. (919) 966-2018

Assistant to Chair

Jacqueline Resnick

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Professors

Jaroslav Fabian Hulka
C. Arden Miller
Earl S. Schaefer
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Professors Emeriti

Sidney S. Chipman
Earl Seigel
¹Elizabeth L. Watkins

Clinical Professor Emeritus

Howard N. Jacobson

Adjunct Professors

Joseph L. Holliday
Frank A. Loda, Jr.
Sarah T. Morrow

Associate Professors

Dorothy C. Browne
Janice M. Dodds
Jonathan B. Kotch
Lewis H. Margolis
Mary Peoples-Sheps
Amy O. Tsui

Associate Professors Emeritae

Geraldine Gourley
E. Barbara Stocking

Adjunct Associate Professors

Pouru Bhiwandiwalla
Richard Nugent
Margie Rose
Thomas Vitaglione
Ann F. Wolfe

Assistant Professors

Sandra Martin
B. Cecilia Zapata

Clinical Assistant Professor

Anita M. Farel

Adjunct Assistant Professors

Lynn Knauff
Peter Lamptey
Marie Meglen
Shyam Thapa

Lecturers

Michael Durfee
Jimmie Rhyne

The Department of Maternal and Child Health is strongly committed to improving the health of women, children, and their families through programs of education, research, and community service.

The educational mission of the Department is to prepare physicians, nurses, social workers, and others for public health leadership positions that are related to such areas as maternity care and family planning; child care and development; comprehensive family-centered health care; aspects of consumer and community development; policy, financing and legislation; and international maternal and child health. A favorable faculty-student ratio is maintained, with learning experiences enhanced by the multidisciplinary composition of faculty and students.

¹Retired August 31, 1990.

A rich variety of interdisciplinary programs in the area provide opportunities for students to develop special interests. These include the Health Services Research Center; Carolina Population Center; Clinical Center for the Study of Development and Learning; Frank Porter Graham Child Development Center; Area Health Education Centers; North Carolina State Department of Environment, Health, and Natural Resources; Family Health International, a rural program of community development and comprehensive health services; and health programs for rural areas and immigrants.

Students with interest in the broad field of maternal and child health pursue a program leading to the Master of Public Health degree. Students having a special interest, such as family planning and population studies or child care and development, may follow a more specialized program which leads to the Master of Science in Public Health degree. Programs usually cover two sixteen-week semesters and a twelve-week summer period, although longer programs may be necessary.

A joint degree program with the Division of Special Education and the Department of Maternal and Child Health prepares professionals to work with handicapped newborn infants, young children and their families in the context of the total community health care system. Graduates of the two-year program receive the MA in Education and the MPH.

A cooperative, dual degree plan of study with the School of Social Work is available to those wishing to obtain concurrently their professional degree in social work and a master's degree in public health with specialization in maternal and child health. Graduates of the two full-year course of study receive the MSW and MPH.

Course sequencing restrictions require students to enter the masters program in the fall semester.

Core and elective courses and field work are the major elements of each program. Knowledge of biostatistics, epidemiology, factors related to the delivery of health services, and an understanding of the ways that biologic, environmental, social and behavioral factors affect health are required of all students. Foundation courses in maternal and child health are also required of all students. Electives may be drawn from many departments of the University. Community-based learning experiences are an integral part of the educational program, with field work assignments individually tailored by the student and faculty adviser.

Departmental courses focus on service and financing programs for mothers, children, and families, and include the historical development, content, characteristics, and planning and evaluative processes. Biologic, sociocultural, and psychological factors are considered as they relate to health needs and problems of maternal-infant health and family planning. Child health problems are given high priority, with opportunity provided to integrate this knowledge with techniques of program planning, implementation, and evaluation. Skills in advocacy, interdisciplinary teamwork, consultation, and research utilization are also taught by the Department.

All students who enroll in the MPH or the MSPH degree programs must meet University requirements for admission to the Graduate School. In addition, the Department admits students who hold prior degrees in the health professions listed below, whose career goals are firmly based in fields related to maternal and child health.

- (1) Medicine—MD or equivalent; consideration is also given to medical students who may exercise an option to complete medical and public health study concurrently, and to physicians who are engaged in residency training or other post-doctoral study who wish to complete public health study simultaneously;



- (2) Nursing—Clinical master's degree in maternity or pediatric nursing, preparation in an approved program of nurse-midwifery or preparation as a nurse practitioner in a relevant practice area, or a bachelor of science in nursing with at least two years of community health experience;
- (3) Social Work—Master of Social Work;
- (4) Other—Professional degrees in dentistry, physical or occupational therapy, education, and other related fields.

Preference is given to health professionals with at least two years of community health experience.

Applicants who hold baccalaureate degrees in a broad range of other related academic fields are considered for admission provided they have been employed for at least two years in a community health-related position and have firm educational and career goals.

Traineeships are available covering tuition, fees, and reasonable living expenses for some students, particularly those with an advanced degree in one of the health professions.

The DrPH in maternal and child health is offered for selected individuals who have previously earned a master's or equivalent degree in a related field. The DrPH program provides an opportunity for intensive study of the biologic, cultural and environmental factors influencing the health of mothers, children and their families; the development of investigative skills; and the application of knowledge, skills and techniques to the improvement of the health of mothers and children. Students indicate upon application which substantive area they wish to pursue in doctoral study. A minimum of two academic years of course work and directed research is required. Required courses include biostatistics and epidemiology, and an additional minimum of 18 semester hours as determined by the student's doctoral committee. A Departmental seminar is required each semester in residence.

Department of Maternal and Child Health

- MHCH 103** **Reproductive Physiology and Conception Control** (2). Human sexuality, reproductive physiology, methods of regulation; pregnancy, fetal wastage, infertility, sterilization, abortion and community responsibilities discussed. *Fall*. Hulka.
- MHCH 105** **Current Issues and Advances in Developmental Disabilities.** (SOWO 105) (3). Permission of instructor. Seminar that will enable students and experts in developmental disabilities to exchange ideas and explore controversial topics. Seminar will address current research and policies which affect service delivery for persons who have developmental disabilities. *Fall, spring*. Staff.
- MHCH 110** **Demography of Women and Children in Developing Countries** (2-3). Introduction to basic population concepts and measures, emphasizing demographic indicators of health and social status of women and children in developing countries. Permission required for all non-majors. *Spring*. Tsui.
- MHCH 118** **Women, Health and Development Policy** (ANTH 118) (WMST 118) (3). Pre-requisite, previous Third World course work or experience. Permission required for advanced undergraduates. Women's social, productive, and reproductive roles each make a special contribution to development. This seminar will examine the roles of Third World women and issues related to reproduction (child bearing, family planning and access to abortion, maternal health and mortality) and production (work in the formal and informal sectors, child care, control of wages, household decision-making). *Three lecture hours per week, fall or spring*. Staff.
- MHCH 125** **Injury as a Public Health Problem** (HBHE 125) (3). Pre- or co-requisite, EPID 160. This course considers the causes and consequences of traumatic injury within developmental, social and economic contexts and dilemmas in injury prevention. Injuries associated with transportation, violence and the home and occupational environments are included. *Three lectures per week, spring*. Runyan, Kotch.
- MHCH 140** **Problems in Maternal and Child Health** (1-3). Prerequisites to be arranged with the faculty in each individual case. *Fall, spring and summer*. Staff.
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- MHCH 200** **Issues in Maternal and Child Health** (3). Permission required. For students outside the Department of Maternal and Child Health who desire a survey of current issues and programs in maternal and child health. Emphasis is on contemporary approaches to problems and services affecting children and families. *Two lecture, two seminar hours, fall*. Staff.
- MHCH 201** **Child Development and Social Policy** (3). Permission of instructor required. Analysis of prevailing social policies as they relate to principles of child development; overview of child development, and case studies on federal policies affecting children and families. *Spring*. Staff.
- MHCH 202** **Comparisons of MCH Policies in Industrialized Nations** (1-2). Seminars center on student reports of MCH policy, programs, and health outcomes among leading industrialized nations. Permission of instructor for all non-majors. *Fall, spring*. Miller.
- MHCH 205** **International Family Planning** (3). Permission required for non-majors. Analysis of the family planning movement, its policies, operations, and research, with emphasis on The Third World. *Three lecture hours a week, fall, spring*. Tsui.
- MHCH 206** **Perinatal Health Services** (2). Prerequisite MHCH 210 or EPID 213. Permission required. Evaluation of local, state and national interventions to im-

prove perinatal health. Topics will include effectiveness of prenatal care, regionalization, risk assessment, racial disparities, linkages with Medicaid, etc. *Fall, spring.* Kotelchuck, staff.

- MHCH 207 International Maternal and Child Health: Community Skills (3).** Permission required for non-majors. MCH skills for working in developing countries: participatory research, risk communication and grant proposal writing. *Three lecture hours per week, spring.* Zapata.
- MHCH 208 Concurrent Field Training in Maternal and Child Health (1-4).** For MHCH majors only. An elective faculty supervised field experience in community maternal and child health services in relation to background of experiences, special interests, and future professional plans. *Variable number of laboratory hours per week, fall, spring and summer.* Staff.
- MHCH 210 Maternal and Infant Health (3).** Permission required for non-MCH majors. Knowledge base, social strategies and health policies that relate to the health and well being of women of childbearing years, neonates and families. *Three lecture hours a week, fall.* Miller, staff.
- MHCH 210L Maternal and Infant Health Laboratory (1).** Co-requisite MHCH 210. Permission required for non-MCH majors. Indepth exploration of specific topics from MHCH 210 Maternal and Infant Health. *Fall.* Staff.
- MHCH 211 Child and Family Health (3).** Prerequisite MHCH 210. Permission required for non-MCH majors. This course addresses major issues in child and adolescent health including interactions among children, their families, and the environment. Following a developmental paradigm, emphasis is given to preventive public health services. *Three lecture hours a week, spring.* Staff.
- MHCH 211L Child and Family Health Laboratory (1).** Prerequisite MHCH 210; MHCH 211 corequisite. Permission required for non-MCH majors. Required small group presentation and indepth discussion of topics covered in lecture. Students will choose two, consecutive groups depending upon availability of leader. *Spring.* Staff.
- MHCH 212 Seminar on the Family (PHNU 212) (1).** Permission of instructor required. Family theory, research and assessment; family relationships and environments that influence adult and child health and development; professions and institutions that influence family functioning. *Two seminar hours a week, spring and summer.* Schaefer.
- MHCH 213 Research and Evaluation Methods in Maternal and Child Health (3).** Permission required for non-MHCH majors. The art and science of MCH research and evaluation. Focuses on assessment of MCH population characteristics, secondary data analysis and the evaluation of MCH programs. A practicum-based course. *Three hours per week, spring.* Tsui, Martin.
- MHCH 214 Field Training in Maternal and Child Health (2-8).** Required of selected students in terms of their background of experience, special interest, and future professional plans. An additional field fee of \$350.00 will be assessed. *Summer, 6-10 weeks.* Staff.
- MHCH 220 Organization of Services for Children with Special Needs (3).** This course focuses on the design, organization, and implementation of services for children with special needs. Participants will analyze the range of services needed by these children. *Spring.* Farel.
- MHCH 224 School Age Population: Health Problems and Programs (PHNU 224) (3).** Permission of instructor required. Health needs and problems of school aged population. Development and evaluation of programs to meet these needs

including examination of legislative mandates, administrative structures, and manpower utilization. *Spring*. Staff.

- MHCH 225** **Practicum: Leadership in School Health Programs** (PHNU 225) (1-4). Prerequisites, MHCH 224 or equivalent and permission of instructor. An elective, individually planned and supervised school-community based field experience. Designed to provide leadership experiences in delivery of school health services. *Spring*. Staff.
- MHCH 246** **Planning Family Health Programs** (PHNU 246, HPAA 246) (3). Permission required for nonmajors. Basic models and methods of program planning. Emphasis on application of methods through the development of program plans for significant family health problems. *Three lecture hours, spring*. Peoples-Sheps.
- MHCH 254** **Social Work in Public Health** (2). Permission of instructor required. Analyzes role and functions of social workers in public health with emphasis on multi-disciplinary practice. Focus is on planning social work component of health program. Observational visits to selected sites. *Fall*. Staff.
- MHCH 300** **Doctoral Seminar in Maternal and Child Health** (1-3) Doctoral seminar in maternal and child health. Advanced topics in Maternal and Child Health. Required of departmental doctoral students every semester until admitted to candidacy. *Fall, spring*. Staff.
- MHCH 307** **Seminar in Disorders of Development and Learning in Childhood** (PHYT 307) (2). Prerequisite, permission of instructor. Seminar for students with prior background in child development or related areas on interdisciplinary diagnosis and management of developmental problems in childhood. Focus on staff and student prepared case material. *Two seminar hours a week, fall, spring and summer*. Knobloch; DDDL staff.
- MHCH 309** **Issues of Advocacy in Maternal and Child Health** (3). Permission of instructor required. Examines the advocacy as a process for influencing policies affecting mothers and children. *Spring*. Browne.
- MHCH 315** **Seminar in Maternal and Child Health** (2). Nonmajors require permission of instructor. This seminar provides an opportunity for students and faculty to explore in greater depth selected subjects within the field of maternal and child health. *Four seminar hours a week, summer*. Staff.
- MHCH 392** **Master's Paper** (1). *Fall, spring, or summer*.
- MHCH 393** **Master's Thesis** (3-6). *Fall and spring*.
- MHCH 394** **Doctoral Dissertation** (3 or more). *Fall and spring*.
- MHCH 400** **General Registration** (0).



Nutrition

Chair

¹Steven H. Zeisel
Professor

Registrar

JoAnn Roth
Telephone No. (919) 966-7212

FACULTY

Professors

John J. B. Anderson
Rosalind A. Coleman
William D. Heizer
Barry M. Popkin
Louis E. Underwood

Clinical Professor

John B. Longenecker

Adjunct Professor

Daniel E. Carroll

Professors Emeriti

²Joseph C. Edozien
³Mildred Kaufman

Associate Professors

Linda S. Adair
Stephen G. Chaney
Janice M. Dodds
Boyd R. Switzer
Martin H. Ulshen

Research Associate Professor

Barbara H. Dennis

Associate Professor Emerita

Rebecca B. Bryan

Clinical Associate Professor Emerita

⁴MaryAnn C. Farthing

Assistant Professors

Pamela Haines
Betty G. Kirkley
Mark J. Koruda
Laureen Lopez

Research Assistant Professor

Alice S. Ammerman

Clinical Assistant Professor

Carolyn J. Barrett

Adjunct Assistant Professors

Marjorie G. Busby
Thomas J. Chegash
Penelope K. Manasco
Miriam Peterson
Cordella H. Rumph

The programs of study in nutrition are designed to prepare qualified individuals for careers in public health and human clinical nutrition. Through these programs a broad curriculum in public health sciences is provided as well as courses in the physiological, biochemical, and behavioral aspects of nutrition and their application to the health of human populations. The programs currently offered lead to BSPH, MPH, and DrPH degrees.

The objective of the BSPH program in nutrition is to provide undergraduate training for students wishing to enter beginning level positions in community and public health nutrition or to pursue graduate training in nutrition, medicine, or dentistry. Application procedures and program descriptions may be found on pages 17-19 of this catalog and in *The Undergraduate Bulletin*.

¹Appointed Professor and Chair, September 1, 1990

²Retired, November 1990

³Retired, July 1990

⁴Retired November 1990

Applicants for all graduate programs should have a “B” average or better and are required to submit Graduate Record Examination (GRE) scores. Applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL) in addition to the usual requirements. A brief autobiographical letter which states the person’s reason for applying to this degree program and his/her future career goals is required. The letter is not to exceed one typewritten page. Graduates in medicine and dentistry are encouraged to apply for admission to the programs and may submit Medical or Dental Aptitude Tests scores in lieu of GRE scores.

Prerequisites for the MPH program include the equivalent of four semesters (two academic years) of the biological sciences (a course in anatomy and physiology and microbiology required), two semesters (one academic year) of chemistry (organic chemistry required), one biochemistry course, two courses in social sciences (such as anthropology, psychology, or sociology), and one introductory course in human nutrition. An introductory course in economics is also recommended. Deficiencies in course prerequisites must be rectified prior to admission.

The MPH program in nutrition provides training in the broad field of public health including the biological and behavioral bases of foods, nutrients and eating practices in human nutrition, an understanding of nutrition-related problems in the community and the application of public health methods to their solution, and clinical and field experiences in the delivery of nutrition services under faculty supervision. The MPH program leads to eligibility for becoming a Registered Dietitian.

To achieve these goals the MPH program is designed to permit each student to gain a strong background in the science and practice of public health. Students take the core courses required by the School as stated on page 21 of this catalog. They are also expected to acquire a sound knowledge of the science of human nutrition. A working knowledge of community nutrition programs and services coupled with adequate opportunities for concurrent block field experience is used to further strengthen classroom and laboratory experiences.

Students must pass a written comprehensive examination based on required and elective courses. This examination covers and integrates three general areas: biological and clinical aspects of nutrition, behavioral aspects of food and nutrition, and public health nutrition, including epidemiology, biostatistics and environmental issues. Students are advised to consider these examination requirements in their selection of elective courses in nutrition and other disciplines.

The Doctor of Public Health degree (DrPH) provides advanced training in practice-based public health nutrition for individuals who will work in academic and public health-related settings. The DrPH graduate has an excellent grasp of nutritional biochemistry and the epidemiologic data which underlay the link between nutrient intake and maintenance of health or the development of disease. In addition, graduates use the major current theories of nutrition and health behavior to effect beneficial dietary changes for individuals and for populations. Following satisfactory completion of the doctoral written and oral examinations, the student proceeds with a research project and dissertation under the guidance of an adviser and doctoral faculty committee. A master’s degree in nutrition (or its equivalent) is required for admission to the DrPH program. Applicants that have not received the MPH degree must satisfactorily complete the requirements of the School of Public Health for the MPH degree before admission to candidacy. Applicants to the program are encouraged to arrange a personal interview whenever possible.

Department of Nutrition

- NUTR 50** **Introduction to Human Nutrition** (3). Presented as an integrated body of knowledge derived from several disciplines. Functions and sources of man's food. Nutrient requirements and their relation to health and disease. The relevance of nutrition to individual well being, social welfare, and economic development. *Fall*. Anderson.
- NUTR 98** **Undergraduate Research in Nutrition** (3). For undergraduates enrolled in the department's baccalaureate degree program. Permission required from faculty research director. Directed readings or laboratory study on a selected topic. May be taken more than once for credit. Staff.
- NUTR 99** **Honors Research in Nutrition** (3). Permission required from faculty research director. Directed readings or laboratory study on a selected topic. Requires a written proposal to be submitted to and approved by BSPH Committee and faculty research director. A written report is required. May be taken more than once for credit. *Six laboratory hours per week, fall, spring, summer*. Staff.
- NUTR 100** **Nutrition and Human Health** (3). Prerequisite, EPID 160. A review of the physiological and environmental determinants of human nutritional requirements and the relation of diet to human health and disease. *Fall*. Anderson, staff.
- NUTR 101** **Aging and Human Development** (PHNU 124/HPAA 124/HBHE 101) (3). Lectures concerned with biological, physical, emotional, demographic and social aspects of aging. Field trips to institutions, and home visits. *Spring*. Staff.
- NUTR 110** **Applied Nutrition for Health Professions** (3). Prerequisites, previous or concurrent courses in chemistry, biochemistry, and physiology/anatomy at undergraduate or graduate level. Knowledge and understanding of nutrition and application to the preventative and therapeutic care of man in a health-team approach. *Spring*. Anderson, staff.
- NUTR 120** **Nutrition Education For Teachers** (3) Prerequisites, teacher certification and permission of instructor. Review of basic nutrition information, materials, and techniques which provide a framework for integrating nutrition education into various subject areas of existing school curriculum in grades K-12. *15 hours per week for 3 weeks, spring*.
- NUTR 140** **Readings in Nutrition** (1-6). Prerequisite, permission of instructor. Reading and tutorial guidance in special areas of nutrition such as international nutrition and nutrition and population. *Fall, spring, and summer*. Staff.
- NUTR 150** **Cell Biology** (4). Prerequisites, a course each in biochemistry and physiology or permission of instructor. A review of the general structure and function of the cell. Chemistry and metabolism of carbohydrates, proteins, lipids, vitamins and minerals. Endocrine and nervous integration of cellular mechanisms. *Fall*. Switzer.
- NUTR 151** **Cell Biology Laboratory** (3). Prerequisites, two chemistry laboratory courses and concurrent registration in NUTR 150. A laboratory course designed to acquaint students with the equipment and theory of modern biochemical and biophysical methods used in nutrition research. *Six laboratory hours per week, fall*. Switzer.
- NUTR 152** **Meal Planning, Food Selection and Preparation** (3). Prerequisite, NUTR 50 or equivalent. Introduction to foods important in the American diet; composition and properties; factors affecting the selection, handling and preparation of foods; menu planning and meal preparation. A laboratory is included. Field fee \$25. *Three lecture hours per week, fall*. Barrett.

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- NUTR 153 Food Production, Processing and Packaging (3).** Prerequisite, NUTR 50 or equivalent. Impact of all parts of food industry on availability and nutritive value of foods, and food safety. *Spring.* Carroll.
- NUTR 154 Human Nutrition (3).** Prerequisites, NUTR 50, CHEM 130, BIOL 45 or permission of instructor. A second level course in human nutrition which deals with nutrient requirements in relation to specific cellular needs and mechanisms. Structural and metabolic aspects of carbohydrates, lipids, proteins, vitamins and minerals. *Fall.* Anderson.
- NUTR 155 Introduction to Public Health Nutrition (3).** Prerequisite, NUTR 50 or equivalent. The functions of the nutritionist in the community, including an assessment of nutritional needs of individuals, with emphasis on interviewing and counseling skills. Existing community food and nutrition programs and services are introduced and their relationship to other health and social programs is studied. *Fall.* Haines.
- NUTR 156 Food Service Systems Management (3).** Permission required for non-majors. Basic concepts of food service system management applied to small and medium-sized group and health care facilities in the community. *Two lecture and two laboratory hours per week, fall, spring.* Chegash.
- NUTR 157 Clinical Nutrition (3).** Prerequisites BIOL 45, CHEM 130, and corequisite NUTR 154 or equivalent courses. A study of the relationship of diet to diseases of man and of dietary intervention in the prevention and/or treatment of these conditions. *Spring.* Staff.
- NUTR 157L Clinical Nutrition Laboratory (1).** Corequisite NUTR 157. Development of clinical nutrition skills. Application of clinical nutrition principles and development of interviewing assessment and counseling skills. *Two laboratory hours per week, spring.* Barrett.
- NUTR 159 Food Habits (3).** Prerequisite NUTR 50 or equivalent. Permission required for non-majors. Social, cultural, and psychological influences on food consumption patterns of individuals. Includes a study of selected research methodologies and alternate U.S. food consumption patterns. *Spring.* Kirkley.
- NUTR 160 Economics of Nutrition and Public Health (3).** Prerequisite, two social science courses. Concepts and methodologies used by economists in examining health and nutritional issues at the microeconomic level. Emphasis will be on examining how economics can be used to understand the determinants and consequences of health/nutritional status and a few key aspects of health and nutritional behavior. *Spring.* Popkin.
- NUTR 200 Maternal, Infant and Child Nutrition (3).** Prerequisite, NUTR 154 or permission of instructor. This course covers the nutritional needs of women during the childbearing years, infants and children; the community, ethnic and socioeconomic influences on food intake of these target populations, and community food and nutrition programs designed to meet their unique nutritional needs. *Two lecture and two seminar hours per week, fall.* Adair.
- NUTR 201 Nutrition of Adults and the Elderly (3).** Prerequisite, NUTR 154 or equivalent or permission of instructor. A review of the effects of the aging process on human nutrition. Physiological, psychological and sociological factors which affect dietary habits and nutrient intake will be examined. *Spring.* Staff.
- NUTR 202 Advanced Human Nutrition (3).** Prerequisite, NUTR 154, EPID 160. A review of the epidemiology, pathology and prevention of disorders related to diet and nutrition. *Spring.* Anderson.
- NUTR 205 Principles of Public Health Nutrition (4).** Prerequisite, NUTR 155 or equivalent. Roles and functions of the nutritionist in community health. Emphasis
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is on understanding the role and function of the health agency and the nutritionist in community assessment to identify major needs for nutrition programs and services. *Two lecture hours and one day concurrent field experience per week, fall.* Lopez.

- NUTR 207 Nutrition Education (3).** Prerequisite, NUTR 50 or equivalent or permission of instructor. Principles and practice of nutrition education with emphasis on the community setting for small groups and individuals. Use of modern techniques, including written and audiovisual instruments, geared to modification of dietary behavior and to prevention of disease. *Spring.* Staff.
- NUTR 208 Nutrition Programs and Services (4).** Prerequisite, NUTR 205, An overview of the planning and management of local, state and federal public health nutrition programs covering their legislative and administrative structures and responsibilities of the nutritionist. *Four seminar hours and concurrent field experience per week, spring.* Dodds.
- NUTR 210 Strategies for Dietary Change (3).** Prerequisite NUTR 155 or permission of instructor. Theories and methods for facilitating dietary change in community settings. Educational and policy approaches are considered. *Three lecture hours per week, spring.* Lopez.
- NUTR 212 Nutritional Assessment (1-3).** Permission of instructor. This course is taught as three independent one credit modules. The theory and rationale of nutritional assessment in individuals and communities is taught for dietary assessment (one credit), anthropometric/clinical assessment (one credit) and biochemical/laboratory assessment (one credit). *Spring.* Switzer.
- NUTR 215 Nutrition in the Third World (3).** Critical review of the dimensions of world problems in nutrition, with emphasis on the micro and macro determinants of malnutrition, the consequences of malnutrition, and the programs and policies for eliminating malnutrition. *Three lecture hours per week, fall.* Popkin.
- NUTR 240 Problems in Nutrition (1-6).** Prerequisites, permission of instructor. A course for students who wish to make a study of some special problem in nutrition. Lectures, seminars and/or laboratory work according to the special area under study. *Fall, spring, and summer.* Staff.
- NUTR 250 Clinical Nutrition Practice (0-6).** Prerequisites, NUTR 152, 157, 157L or equivalent. Students are assigned to a medical facility where, under supervision of registered dietitians, they participate in nutritional care of patients. Field fee of \$450. *Forty hours per week for twelve weeks, summer.* Barrett and field preceptors.
- NUTR 251 Field Experience II (1-4).** Students are assigned to a state, local or district health agency or other appropriate agency for supervised field experience. Field fee required (\$450). A brief written report of activities is required. *Fall, spring, and summer.* Dodds, Lopez, staff and field preceptors.
- NUTR 252 National Nutrition Issues (1).** Prerequisite NUTR 208 or permission of instructor. Three-day indepth seminars held in Washington, D.C. on current national nutrition issues, policy formulation and program development with key congressional staff, federal agencies staff and pertinent public interest/consumer advocacy groups. Paper required. Field fee \$50. *Spring.* Dodds.
- NUTR 300 Nutritional Aspects of Protein, Lipid and Carbohydrate Metabolism (3).** Prerequisites, NUTR 150 and 154. Recent advances in the nutritional aspects of protein, lipid, and carbohydrate metabolism will be reviewed. *Six seminar hours per week, fall.* Switzer.

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- NUTR 301 Nutrition Aspects of Mineral Metabolism (3).** Prerequisites, NUTR 150 and 154, 212. Recent advances in the nutritional aspects of mineral metabolism will be reviewed. *Three lecture hours per week, spring.* Anderson.
- NUTR 302 Nutritional Biochemistry (3).** Prerequisites, NUTR 151 and 212. Research procedures in nutritional biochemistry and physiology, including the identification and measurement of nutrients and their metabolites in foods and in human and animal tissues and body fluids. *Three laboratory hours per week, fall.*
- NUTR 303 Advanced Seminar in Public Health Nutrition (3).** Prerequisites, NUTR 205; NUTR 208 or 215. The broad aspects of public health issues, such as U.S. and international nutrition problems and issues, intervention options, and policy decisions—basis and rationale—will be discussed. *Six seminar hours per week, spring.* Haines.
- NUTR 304 Advanced Seminar in Nutrition Behavior (3).** Prerequisites, NUTR 159 and 210 or permission of instructor. Analysis of the ways anthropological, economic and psychological approaches can be used to understand nutrition behavior and to effect nutrition change. *Six seminar hours per week, fall.* Kirkley.
- NUTR 340 Seminar in Nutrition (1-6).** Prerequisites, a minimum of one year of graduate work in nutrition and permission of instructor. Seminars and/or laboratory work, according to the special area under study. *Fall, spring and summer.* Staff.
- NUTR 355 Nutrition Research Methodologies (3).** Prerequisites, NUTR 205 and 208 or permission of instructor. Development of skills, techniques and competencies, through practical experience, in the assessment of the nutritional needs of a community, or in the planning and delivery of community nutrition services in a health or other appropriate agency or the evaluation of an ongoing nutrition program. *Six laboratory hours per week, fall, spring and summer.* Staff.
- NUTR 389 Elements of Being a Scientist (2).** Focuses upon the key elements that contribute to a successful career as a scientific researcher. These include: making a scientific presentation, scientific photography and graphics; writing a scientific manuscript and evaluating published manuscripts; grant writing and sources of funding; introduction to peer review of research grants; use of animals and humans in research; scientific ethics. *Two lecture hours per week, fall.* Zeisel.
- NUTR 390 Nutrition Research (1-9).** Individual arrangements will be made by the student to spend part or all of his time in supervised investigation related to thesis or dissertation. *Fall, spring and summer.* Staff.
- NUTR 391 Nutrition Research Seminar (1).** Instruction in preparing seminars. Students will also attend and learn to critique nutrition faculty seminars. *Fall and spring.* Popkin.
- NUTR 392 Master's Paper (1-6).** *Fall, spring and summer.* Staff.
- NUTR 393 Master's Thesis (0-6).** *Fall, spring and summer.* Staff.
- NUTR 394 Doctoral Dissertation (0-9).** *Fall, spring and summer.* Staff.
- NUTR 400 General Registration (0).**
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Public Health Nursing

Chair

Marla E. Salmon
Professor

Deputy Chair for Student Affairs

Marion E. Highriter
Associate Professor

Registrar

Susan Harris
Telephone No. (919) 966-1069

Deputy Chair for Administration

Rachel H. Stevens
Clinical Assistant Professor

FACULTY

Professor

Jan R. Atwood

Professor Emerita

Dorothy M. Talbot

Associate Professor

Mary Peoples-Sheps

Associate Professors Emeritae

Nora F. Cline

Elizabeth M. Edmands

Rose G. George

Ann C. Hansen

Beatrice B. Mongeau

Julia D. Watkins

Research Associate Professor

Jean Kincade Norburn

Adjunct Associate Professors

Estelle M. Fulp

O. Marie Henry

Helen Jo McNeil

Assistant Professor

Vangie A. Foshee

Bonnie Rogers

Clinical Assistant Professors

Lorraine B. Johnson

Sandra E. Shay

Clinical Assistant Professor Emerita

Clara Walters

Adjunct Assistant Professors

Linda Frederick

Betty B. Griffith

Therese Lawler

Elizabeth Randall-David

Nancy L. Tigar

Clinical Instructor

Karen Mastroianni

Adjunct Instructors

Marilyn Asay

Dolores Brookshire

Kathleen P. Paterson

Susan A. Randolph

Emily J. Rivenbark

Catherine J. Staes

Lecturers

Lou K. Brewer

Elizabeth M. Tornquist

The Curriculum in Public Health Nursing provides graduate study in generalized public health nursing with opportunities to specialize in the area of occupational health nursing. Opportunities are provided for students to participate in faculty members' research, continuing education and technical assistance activities which are conducted throughout North Carolina and the region.

Although full-time enrollment is encouraged, students may choose to enroll part-time. Students are normally admitted at the beginning of the fall semester and must

meet the general University requirements for admission to graduate studies. In addition to the general requirements, the Curriculum in Public Health Nursing requires the following:

- A baccalaureate degree with a major in nursing from an NLN accredited program
- Evidence of Registered Nurse licensure and one year of work experience
- Coverage by professional liability insurance
- Attainment of satisfactory scores on the Graduate Record Examination

In exceptional cases, persons not meeting all requirements may be accepted for admission on a conditional basis. Ability to meet the conditions satisfactorily will allow continuation in the Curriculum after the first semester. Inability to do so will result in discontinuation of student status after the first semester.

The Curriculum offers the Master of Public Health (MPH) with subspecialty options in public health nursing administration, occupational health nursing, or an independent option that requires arrangement with a faculty adviser prior to admission. It also offers the Master of Science (MS) degree with emphasis on preparation for careers in research and teaching in the areas of subspecialty options mentioned for the MPH.

The MPH program requires a minimum of one calendar year of study in addition to the master's paper. The MS program requires two academic years and 45 semester credits.

Programs are planned with faculty advisers on the basis of individual experience, needs, and career goals. A minimum of fifteen credits of public health nursing courses is required.

The program of study in the delivery of public health nursing administration is designed to prepare nurses for collaboration on multidisciplinary teams in planning, conducting and evaluating community health services and for the design and delivery of public health nursing services. Required public health nursing courses include **Public Health Nursing I and II** (PHNU 302-303), **Research Methods in**



Public Health Nursing (PHNU 299) or its equivalent, **Advanced Studies in Administration of Community Nursing Services (PHNU 360)**, and **Field Practice in Community Health Nursing (PHNU 396)**. Public health courses required for the MPH degree are listed on page 21. Selected courses in health policy and administration are required. A master's paper on a subject pertinent to public health nursing is required in addition to satisfactory completion of a written comprehensive examination.

The program in occupational health nursing is designed to prepare nurses for positions in advanced practice, consultation, administration, or supervision. In addition to the School core requirements, students are required to take PHNU 281, 282, 299 or the equivalent, 302-303, 396, and selected courses in the environmental health sciences. Additional clinical practicums are encouraged. A master's paper on a subject pertinent to occupational health nursing is required in addition to satisfactory completion of a written comprehensive examination. As part of the UNC Occupational Safety and Health Educational Resource Center (OSHERC), the occupational health nursing program offers an interdisciplinary educational program.

The program leading to the MS degree is designed to prepare nurses for careers in research and teaching related to public health or occupational health nursing. The same subspecialty options available within the MPH program are available within the MS with the same nursing course requirements. A master's thesis is required in addition to satisfactory completion of a written comprehensive examination. Electives are selected to meet individual needs.

The Curriculum offers part-time Off-Campus MPH degree programs at different sites in North Carolina. In this program the student meets the MPH degree requirement of one year's full-time study in three and one-half years on a part-time basis.

Curriculum in Public Health Nursing

- PHNU 124** **Aging and Human Development (HPAA 124, HBHE 101, NUTR 101) (3).** Lectures concerned with biological, physical, demographic and social aspects of aging. Field trips to institutions and home visits. *Three lecture hours per week.* Staff.
- PHNU 140** **Readings in Public Health Nursing (1-3).** Prerequisites to be arranged with the faculty. Reading and tutorial guidance in a selected area of public health nursing or occupational health nursing. *Two or more hours per week, fall, 142* *spring, and summer.* Staff.
- PHNU 160** **Delivery of Community Nursing Services (3).** Permission of instructor required. Analysis of patterns of organization of community nursing services and relationships to the health care delivery system. Special emphasis on basic management skills and their application. Staff.
- PHNU 171** **Continuing Education Program Development (2).** Permission of instructor required. Use of systematic approach to educational program development for adult learners. Includes strategies for designing, implementing and evaluating CE and inservice programs. *Two lecture hours per week, fall.* Staff.
- PHNU 172** **Implementation of Continuing Education Programs. (1).** Permission of instructor required. Prerequisite: PHNU 171. Application of teaching-learning concepts, principles of adult education and group teaching strategies in the implementation of CE and inservice programs. *Two seminar hours per week spring.* Staff.
- PHNU 182** **Health Care Services in Occupational Settings (3).** Introduction to population-based health care for workers. Includes major causes of work-related morbidity

and mortality, strategies for the team approach and components of occupational health programs. *Three lecture hours per week and a plant walk through, spring.* Staff.

- PHNU 185** **Topics in Worksite Health Promotion (3)** (HBHE 185) An overview of critical scientific, political, economic, behavioral and other issues as they affect planning, conduct and evaluation of health promotion/risk reduction programs at the worksite. *Spring.* Staff.
- PHNU 193** **Innovation and Change in Public Health Nursing Practice I (3).** Permission of instructor required. Analysis of factors and approaches considered in innovation and change in public health nursing. This includes development of the theoretical base of public health nursing practice. *Two lecture and two seminar hours per week.* Staff.
- PHNU 196** **Advanced Practice in Public Health Nursing (3).** Permission of instructor required. Prerequisite: licensure as registered nurse in North Carolina. Concepts of health promotion/illness prevention applied to families/groups/community. Methods of assessment and intervention. Selected practice experiences. Analysis of case materials. Field fee: \$150.00. *One lecture, two seminar and two laboratory hours per week.* Staff.
- PHNU 201** **Special Studies (1-3).** Permission of Department chair required. Sections will focus on specific topics of current interest to health workers. Fliers describing the section offering will be distributed prior to registration each semester. *Lecture hours per week dependent upon credit, fall and spring.* Staff.
- PHNU 212** **Seminar on the Family (MHCH 212) (1).** Permission of instructor. Family theory, research and assessment; family relationships and environments that influence adult and child health and development; professions and institutions that influence family functioning. *Two seminar hours per week, spring and summer.* Schaefer.
- PHNU 215** **Analysis of Developmental Intervention Programs (2).** Permission of instructor. Critical review of intervention programs for infants and young children aimed at the prevention of developmental deficits. Examination of rationale for intervention, content and form of program delivery and methods for evaluating effectiveness. *One lecture and two seminar hours per week, fall and spring.* Staff.
- PHNU 217** **Developmental Indices of Health Status in Infants and Young Children (2).** Permission of instructor. Concepts and methods in the early identification of developmentally at-risk populations. Examines issues in reliability, validity, and applicability of measurements used in the assessment of early cognitive and social development. *One lecture and two seminar hours per week, fall and spring.* Staff.
- PHNU 220** **Assessment and Care of Pregnant Women (2).** Theoretical basis of antepartal care emphasizing the concept of risk and assessment of maternal and fetal well-being. *Spring.* Staff.
- PHNU 222** **Family Planning Theory: Assessment and Care of Women in the Reproductive Years (1).** For health professionals doing family planning counseling. Includes modes of action effectiveness, contraindication, side effects, complications, advantages, disadvantages of temporary and permanent methods of birth control. *On request.* Staff.
- PHNU 224** **School Age Population: Health Problems and Programs (MHCH 224) (3).** Permission of instructor required. Health needs and problems of school aged population. Development and evaluation of programs to meet those needs, including examination of legislative mandates, administrative structures and manpower utilization. *Spring.* Staff.
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- PHNU 225 **Practicum: Leadership in School Health Programs** (MHCH 225) (1-4). Prerequisites MHCH/PHNU 224 or equivalent and permission of instructor. An elective, individually planned and supervised school-community based field experience. Designed to provide leadership experiences in delivery of school health services. *Three to twelve laboratory hours per week, spring.* Staff.
- PHNU 240 **Problems in Public Health Nursing** (1-4). A course for students in public health nursing. Students will make an intensive study of some special problem in public health relevant to public health nursing. The study will result in a paper which will demonstrate the application of research principles. *Hours to be arranged. Fall, spring, and summer.* Staff.
- PHNU 246 **Program Planning in Family Health** (HBHE 218, HPA 246, MHCH 246) (3). Permission required by instructor. Basic models and methods of program planning. Emphasis will be on application of methods through the development of program plans for significant family health problems. *Three lecture hours, spring.* Peoples-Sheps.
- PHNU 255 **Consultation in Public Health** (2-3). Examination of the practice of case and program consultation in public health settings. Analysis of consultation as a mutual problem-solving process including evaluation. Roles and relationships of consultant and consultee are considered with provision for experiential learning opportunities. Emphasis is on multidisciplinary practice. Field experience and written report accepted for additional credit hours. *One and one half lecture hours per week, fall and spring.* Staff.
- PHNU 261 **Administration of Community Nursing Services I** (3). Permission of instructor. Concepts and methods of administering community nursing services. Functions of the nurse administrator in areas of organizing, staffing, program planning, priority setting and evaluation of services. *Fall.* Staff.
- PHNU 262 **Administration of Community Nursing Services II** (3). Permission of instructor required. Continuation of PHNU 261. Aspects of fiscal management, personnel management, legal considerations, records and reporting relating to delivery of community nursing services. Leadership styles, motivation and application of administrative processes. *Spring.* Staff.
- PHNU 271 **Instructional Approaches in Community Health Nursing** (3). Permission of instructor. Prerequisites: EDCI 208 and 265 or equivalents. Application of educational theories and curriculum development in nursing education. Study and critique of PHN content in nursing curriculum, of bases and strategies for curricular decisions and instructional approaches. *Two lecture and two seminar hours per week, fall.* Staff.
- PHNU 272 **Practicum in Teaching Community Health Nursing** (3-6). Permission of instructor required. Supervised experience involved in teaching community health nursing to students at the undergraduate level. Problems related to curriculum, organization, and faculty roles will be explored under faculty direction. Field fee: \$450.00. *One seminar hour biweekly and eighteen laboratory hours weekly, fall and spring.* Staff.
- PHNU 281 **Occupational Health Nursing I** (2-3). Permission of instructor required. Concerns factors influencing the development and operation of occupational health nursing programs. General and special health services contingent on work environment and inherent health problems in the employed populations are considered. *Fall.* Rogers.
- PHNU 282 **Occupational Health Nursing II** (3). Prerequisites, PHNU 281. Continuation of PHNU 281. Role components of occupational health nursing with emphasis on designing, implementing, evaluating occupational health programs. Application of principles of toxicology, epidemiology and occupational health nursing. Rogers.
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- PHNU 283 Occupational Health Nursing, Field Practicum I (1-3).** Pre-corequisite, PHNU 281. Permission of instructor required. The student will have the opportunity to discuss concepts of OHN practice and the work environment. Concepts related to workplace hazards, interdisciplinary activities and nursing interventions with worker aggregates will be emphasized. *Three to nine laboratory hours per week.* Rogers.
- PHNU 284 Occupational Health Nursing Field Practicum II (1-3).** Prerequisites PHNU 281, 283. Corequisite PHNU 282. Permission of instructor required. The student will have the opportunity to learn about the managerial and administrative role of the OHN. Emphasis is placed on analysis of the organizational structure, external influencing factors and evaluation mechanisms. Rogers.
- PHNU 293 Innovation and Change in Public Health Nursing Practice II (3-6).** Permission of instructor required. Integration of selected factors of innovation and change into the practice of public health nursing. Practice credit variable. *Two lecture, two seminar, and zero to nine laboratory hours per week. Fall, spring, summer.* Staff.
- PHNU 297 Supervision in Public Health Nursing (3).** Permission of instructor required. For public health nursing and other selected students. Philosophy, principles and methods of supervision with emphasis on the supervisor's role in staff development and first-level management. *One lecture and four seminar hours per week, fall, spring.* Staff.
- PHNU 299 Research Methods in Public Health Nursing (2-4).** Permission of instructor required. Prerequisite: BIOS 101. Analysis of nursing research emphasizing methodology and implications for community health nursing practice. For over two credits, students develop a research design or participate in the research process. *Two lecture and two seminar hours for ten weeks for two credits. Additional proposal development seminars for four credits.* Norburn.
- PHNU 300 Seminar in Public Health Nursing (3).** Permission of instructor required for nonmajors. A departmental core course designed to strengthen knowledge bases and leadership skills important to advanced public health nursing practice. Emphasis is placed on nursing theory and current issues affecting practice. *Two lecture and two seminar hours per week.* Staff.
- PHNU 301 Field Observation of National Community Health Nursing Service (1).** Permission of instructor required. Orientation to national agencies in Washington, D.C. area concerned with community health nursing practice. Supervised visits made to agencies, e.g., The Division of Nursing, HHS, ANA, and APHA headquarters. Field fee \$150.00. *Three full consecutive days of field observations and seminars, spring.* Staff.
- PHNU 302 Public Health Nursing I (3).** Permission of instructor required for nonmajors. A core course designed to strengthen knowledge bases and leadership skills in advanced public health nursing practice. Emphasis is placed on nursing theory, current issues affecting practice, and community assessment. *Fall.* Staff.
- PHNU 303 Public Health Nursing II (3).** Permission of instructor required for nonmajors. A core course designed to strengthen knowledge bases and leadership skills in advanced public health nursing practice. Supervised experience emphasizing design and evaluation of public health nursing interventions for population aggregates. *Spring.* Staff.
- PHNU 340 Research in Public Health Nursing (1-4).** Prerequisite, PHNU 299 or the
341 equivalent and permission of instructor. Independent research in public health
342 nursing under supervision. *Two to eight laboratory hours per week, fall, spring, summer.* Staff.
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- PHNU 360** **Advanced Studies in Administration of Community Nursing Services (3).** Permission of instructor required. Integration of theories, concepts, methods of administration and nursing; their application to delivery of community nursing services. Emphasis is placed on roles and functions of the nurse manager. *Spring.* Stevens.
- PHNU 392** **Master's Paper (1-6).** Permission of instructor required. A major paper on a problem relevant to public health nursing. This study may extend over more than one semester. Credit is assigned accordingly. *Fall, spring and summer.* Staff.
- PHNU 393** **Master's Thesis (3-9).** *Fall, spring, and summer,* Staff.
- PHNU 396** **Field Practice in Community Health Nursing (3-9).** Permission of instructor. Field experience in public health nursing or occupational health nursing practice. Study and observation of selected areas related to student's program of study. Field fee. \$450.00. *Three laboratory hours per week, for each credit, fall, spring, and summer.* Staff.
- PHNU 400** **General Registration (0).**



Divisions and Special Programs

Division of Community Health Service

Director — Richard M. House

In recognition of its public responsibility, the School is actively involved in community service throughout the state of North Carolina. Service projects, in addition to providing direct assistance to agencies and professionals in the field, allow the School to demonstrate the relevance of teaching and research efforts to current community problems. The Division functions as an interface between the School and the health-related organizations in the state which form a major part of its constituency. For students interested in community involvement, the Division can provide resources ranging from information to financial assistance.

The Division promotes faculty consultation to agencies involved in planning, organizing, and delivering health services by matching agency needs with faculty interests. The Division also facilitates opportunities for various groups, community leaders, and organizations to interact with faculty and others in discussing health issues and policy, thereby contributing to public health policy at the local, state, and national levels.

The Office of Continuing Education coordinates the development and implementation of conferences, workshops, and seminars for local, state, and national public health and human service professionals. These programs have three primary objectives: (1) providing up-to-date information on scientific advances and innovations in the design and delivery of health and human services; (2) reducing the lag time between development of new knowledge and its application in practice; and (3) offering short term training in specialty areas not normally available in existing formal educational programs.

In addition, the continuing education office assists official and voluntary health agencies, professional associations, and other higher educational institutions in developing continuing education programs.

The Area Health Education Centers (AHEC) activities are designed to decentralize the education of health professionals and to strengthen regional resources for meeting health manpower training needs. Each of the five Health Science schools in the University is linked with the nine regional AHEC offices through a network of coordinators. The AHEC Program Unit for the School of Public Health is located within the Division. The AHEC network supports technical assistance and continuing education services by the faculty to organizations and professionals across the state.

For students, AHEC provides advice and assistance in locating sites for concurrent and block field training. The Division receives local requests for student assistance via the AHEC regional offices located throughout the state. With knowledge of a student's interests and experience, the Division staff in the School can assist in negotiating a suitable field placement. In addition, the AHEC Program has funds available for student travel and housing during field training.

The Learning Resources Center supports the teaching, research and service activities of School of Public Health faculty. The Learning Resources Center provides consultation on educational methods and communications technology, management of the school's audiovisual equipment, and a variety of media production services. Staff expertise in instructional design, graphic design, and audiovisual production is available to faculty from initial concept to completed project. Development of audiovisual materials for courses taught in the SPH is provided free of charge as is consultation on creating or revising lectures and courses. Periodically, workshops are held for students on such topics as organizing and making presentations, selecting and using media, and educational methodology. The Learning Resources Center also designs and produces brochures, newsletters and other departmental and school publications, and assists faculty in developing videotapes, instructional software and other materials needed for research and service projects.

The Director of the Division of Community Health Service is available to answer further questions about the Division and its services.

Program on Aging

The schoolwide Program on Aging promotes research, teaching and service activities related to the health care of the aged. Its strong emphasis on research reflects a conviction that the emergent field of aging still lacks a sufficient empirical basis for sound public policy development.

Involvement in research projects of the Program on Aging is strongly encouraged as students pursue a course of study in one of the traditional public health disciplines. Students may associate with the Program through: taking courses; working with faculty associates in Health Policy and Administration, Biostatistics, Epidemiology, Public Health Nursing or Health Behavior and Health Education as a member of a research project team; or writing an aging policy-related undergraduate honors paper, master's paper or doctoral dissertation. A limited number of research assistantships are available each year.

Course offerings include: HPAA 163, **Geriatric Health and Medical Care**; HPAA 164, **Health Policy and Aging**; HPAA 122-123, **Long Term Care Administration I and II**; PHNU 124, **Aging and Human Development**; and a variety of courses in disciplines which study demographic, economic, sociological and epidemiologic aspects of population subgroups and age change.

A national survey of adult day care centers has yielded a new interactive software package which will be made available to adult day care centers, hospitals, nursing homes and other interested service agencies who want to explore offering cost-effective adult day care services.

Other research projects include an examination of the use, cost, and out-of-pocket expense of nursing home care in the United States and how private long-term care insurance policies may impact on the economic well-being of the elderly. In addition, using national data sets, estimates of the costs of publicly-financed long term care insurance have been produced. Other studies include modelling the risk of nursing home institutionalization and the prevalence of functional dependency among the elderly population in states and counties. Using findings from these and other ongoing studies, researchers are exploring ways of improving efficiency of home care programs so that they operate closer to the breakeven point in net social costs. Research findings are disseminated widely in presentations and leading health services research journals.

Division of Computing and Information Services

Director – Robert C. Schreiner

The Division of Computing and Information Services (CAIS) is an organization to serve the unique computing and information management needs of the faculty, staff and students of the School of Public Health. Long a part of the Dean's Office as Central Computing and Data Processing, CAIS was organized as a separate Division in 1986.

CAIS serves a number of distinct purposes:

- Central operation of administrative, word processing, and office automation system for staff and faculty use.
- Access to School, campus, and other data communications networks for faculty, students and staff.
- A microcomputer laboratory for student educational use. Management of the lab is a collaborative effort with the University's Microcomputing Support Center.
- Terminal and printing facility for use with the University's Academic Computing Services' IBM mainframe.

Computing for School administrative, word processing, and office automation is provided by VAX/VMS and RISC/UNIX computers. Software includes MASS-11 word processor, 20/20 integrated spreadsheet, Datatrieve and Ingres data base management systems, electronic mail for local and network access, and a personal calendar system.

Specialized software includes fiscal, personnel, student, inventory, and short course management information systems. Some of the systems are developed and maintained in collaboration with the School of Medicine's Office of Information Systems.

CAIS offers a variety of short courses ranging from various aspects of word processing to use of the specialized information systems. The School provides a well-equipped training room for hands-on training for CAIS services.

All offices in the McGavran-Greenberg/Rosenau complex are wired for access to the School of Public Health computers and to the terminal service of the campus broadband. Some offices are also connected to the School Ethernet and to the campus' extended Ethernet. The School of Public Health VAX system is a member of the Bitnet network. Access is also provided to the Internet.

The microlab network includes 32 Zenith 386 PCs and 8 Macintosh LC machines housed in two rooms. One room has a projector and may be reserved for classroom use. In addition, with the cooperation of Health Sciences Library, the Microlab has five workstations for access to MEDLINE and other CD-ROM databases.

The School maintains a group of 3270-type terminals for direct access to ACS' IBM mainframe. CAIS operators manage a high speed printer directly attached to ACS.

Institute for Environmental Studies

Director – Frederic K. Pfaender

The Institute for Environmental Studies is administratively located within the Department of Environmental Sciences and Engineering of the School of Public Health, but has a campus-wide mission as a focal point for interdisciplinary work in environmental studies. The general purposes of the Institute are to foster and coordinate interdisciplinary research, teaching, and service in environmental concerns among the various units of the University of North Carolina at Chapel Hill. In addition, the Institute assists in cooperative efforts on environmental matters between the Chapel Hill campus and other campuses of the University of North Carolina, with other colleges and universities, and with governmental and private organizations. Specific activities include sponsorship of the annual Environmental Studies Visiting Lecture Series, development of information for students concerning environmental courses and curricula, sponsorship of seminars and colloquia, development of interdisciplinary research proposals, technical assistance and educational programs for the public.

Office of International Public Health Programs

Acting Director – Donald T. Lauria

The Office of International Public Health Programs facilitates the development of the international and cross-cultural research, consultation and training activities of the School of Public Health. It also assists the School in adapting its programs to the needs of foreign students, visiting scholars and students who intend to pursue an international health career. The office maintains and develops relationships with other international program units on campus and with international assistance agencies and governments to promote the exchange of expertise and the establishment of collaborative research and demonstration projects, particularly with the less developed countries of the world.

Other activities of the Office include the sponsorship of the International Health Forum, a University organization of faculty and students with interests in international health, an International Health Careers Program and the School's Foreign Student Advisory Committee. The Office administers a grant from the United States Agency for International Development (USAID) which supports faculty and students in international research projects associated with USAID programs. The grant assists in strengthening the international capabilities of the School and other health-related units on campus and is aimed in part at promoting collaboration with Howard University in Washington, DC on projects of interest to USAID. The Office also administers the Water and Sanitation for Health (WASH) project through a subcontract with the consulting engineering firm of Camp, Dresser and McKee (CDM). This USAID-funded project for which CDM is the prime contractor is the primary mechanism through which the United States provides input to the global Drinking Water Supply and Sanitation Decade. The School's contributions to WASH in its 10-year history have been in the areas of teaching, research, and technical assistance. The Office also administers several joint agreements with universities abroad for collaboration on projects of mutual interest.

Center for Health Promotion and Disease Prevention

Director — O. Dale Williams

The Center for Health Promotion and Disease Prevention is a collaborative activity of the Schools of Public Health, Dentistry, Medicine, Nursing, and Pharmacy and the office of the Vice Chancellor for Health Affairs.

The Center was developed to foster an interdisciplinary response to the ever growing need for health promotion and disease prevention activities in the state, region and nation. The Center focuses on such programs to try to stop unnecessary suffering and premature deaths caused by preventable health problems.

The Center governance includes a Policy Board, chaired alternately by the deans of the Schools of Public Health and Medicine, which sets the overall direction and an Operational Committee, including representatives from the five schools, North Carolina's State Health Director, the University's Health Services Research Center and the office of the Vice Chancellor for Health Affairs, which develops programs and activities. Task Forces have been organized on cancer prevention, cardiovascular disease, health professions education, injury prevention and low birth weight. Also included are groups on aging and children and youth.

Health Services Research Center

Director — Gordon DeFries

Established in 1968, the Health Services Research Center has organized interdisciplinary research on the structure and impact of health care services delivery systems. A fundamental interest has been the interaction between the medical care system and vulnerable populations, such as the elderly, people in poverty, rural residents, minority groups, children, the chronically ill, and the mentally ill. Questions about access to care, quality of care, efficacy and effectiveness of care as they affect health-related quality of life are examined in a variety of studies. The Health Services Research Center continually reexamines its research agenda to ensure that resources are applied to questions of particular importance, with research and evaluation work divided into 10 program areas: The Health Professions; Health Care Organizations; Medical Practice; Health Promotion and Preventive Health Services; Mental Health Services; Aging, Disablement and Long-Term Care; Child Health Services; Health Care Economics and Finance; International Health Services; and Health Policy Analysis. Coordinated with its research and evaluation agenda are the Center's efforts in information dissemination, technical assistance and education. With over 20 years of health care research and policy analysis experience, there are many opportunities for those interested in using Center-sponsored research as the source of data for their own investigations, and the Center stands ready to be of assistance to students and faculty with interests in these issues.

Carolina Population Center

Director — J. Richard Udry

The Carolina Population Center provides coordination for a University-wide interdisciplinary program in population research and research training. Its efforts span the social, behavioral, and health sciences. In addition to the School of Public Health Departments (Biostatistics, Epidemiology, Health Policy and Administration, and Maternal and Child Health), primary population courses are offered in anatomy, anthropology, city and regional planning, economics, geography, psychology, and sociology. These courses are selected by the Population Center training committee to represent appropriate opportunities for concentration of studies on population dynamics, policy, and research methodology as well as demography.

The Department of Biostatistics provides courses in methods of demographic measurement, analysis, and modeling. The Department of Epidemiology deals with population dynamics and family planning, as well as methodology. In the Department of Health Policy and Administration, concentration is in population policy and administration. The Department of Maternal and Child Health is concerned with family planning and human reproduction.

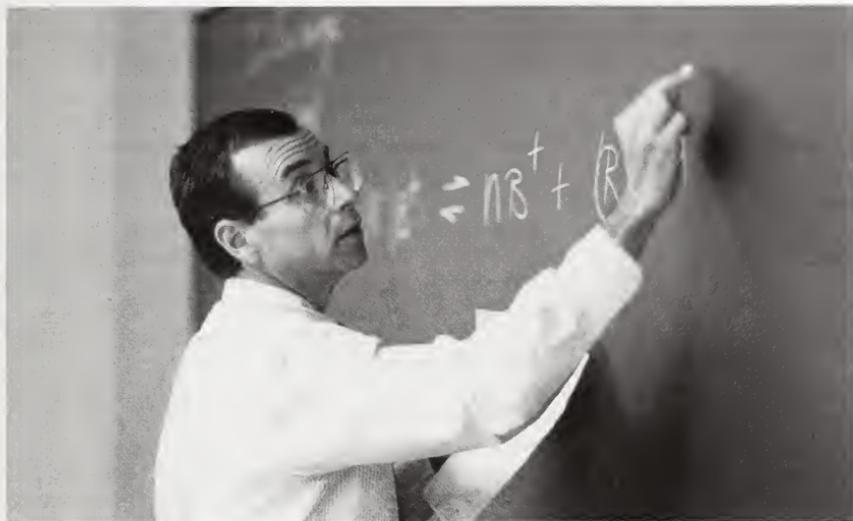
Additional information concerning opportunities for special study in this field may be obtained from the heads of the departments listed above, or from the training office of the Carolina Population Center.

Occupational Health Studies Program

Director — Carl M. Shy

The Occupational Health Studies Program is an interdisciplinary research group involving the Departments of Biostatistics, Environmental Sciences and Engineering, and Epidemiology. It is administratively based in the Department of Epidemiology. The program conducts studies to identify work-related illness and causes of death, to identify environmental hazards, and to develop recommendations for surveillance to permit early detection of health problems and hazards.

In the 1970's the OHSP conducted a major occupational health research program in the tire and rubber industry with support by the United Rubber, Cork, Linoleum, and Plastic Workers of America International Union and the General, Goodyear, Firestone, and Uniroyal Companies. Subsequently, a major research project was completed in the phosphate fertilizer industry with support from the Florida Phosphate Council. More recently, the OHSP began a study of cancer risks in the North Carolina Dusty Trades Industry. This study is being conducted cooperatively with the National Institute of Occupational Safety and Health and the National Cancer Institute. The research of the OHSP provides excellent opportunities for specialized training programs for students with specific interest in occupational health.



Faculty

- James Ralph Abernathy** (1965), *Professor of Biostatistics* – B.S., 1951 (Samford); M.S.P.H., 1953 (The University of North Carolina); Ph.D., 1965 (The University of North Carolina at Chapel Hill)
- Linda S. Adair** (1988), *Associate Professor of Nutrition* – B.S., 1971 (State University of New York at Stony Brook); Ph.D., 1980 (University of Pennsylvania)
- Michael Aitken** (1987), *Assistant Professor of Environmental Sciences and Engineering* – B.S., 1978 (State University of New York); M.S., 1980 (University of California); Ph.D., 1988 (University of Notre Dame)
- Phillip William Albro** (1981), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.A., 1961 (University of Rochester); Ph.D., 1968 (St. Louis University)
- Timothy E. Aldrich** (1988), *Adjunct Assistant Professor of Epidemiology* – B.S., 1972, M.P.H., 1979 (University of Alabama at Birmingham); Ph.D., 1985 (University of Texas at Houston)
- James Elmore Allen** (1968), *Associate Professor of Health Policy and Administration, and Senior Research Associate, Carolina Population Center* – B.A., 1957 (University of Arizona); S.T.B., 1960, Ph.D., 1964 (Boston University); M.S.P.H., 1969 (The University of North Carolina at Chapel Hill)
- Naomar Almeida-Filho** (1986), *Adjunct Associate Professor of Epidemiology* – M.D., 1976 (Famed-Ufba, Brazil); M.P.H., 1978 (University of Bahia, Brazil); Ph.D., 1981 (The University of North Carolina at Chapel Hill)
- Ingrid A. Amara** (1985), *Adjunct Assistant Professor of Biostatistics* – B.S., 1969, (Arizona State University, Tempe); M.S.P.H., 1975, Dr.P.H., 1983 (The University of North Carolina at Chapel Hill)
- Deborah A. L. Amaral** (1988), *Assistant Professor of Environmental Sciences and Engineering* – B.A., 1979 (Reed College); M.S., 1981, Ph.D., 1983 (Carnegie-Mellon University)
- Alice S. Ammerman** (1990), *Research Assistant Professor of Nutrition* – B.A., 1976 (Duke University); M.P.H., 1981, Dr.P.H., 1990 (The University of North Carolina at Chapel Hill)

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- John J. B. Anderson** (1971), *Professor of Nutrition* — B.A., 1956 (Williams College); M.A.T., 1958 (Harvard University); M.A., 1962 (Boston University); Ph.D., 1966 (Cornell University)
- Dragana Andjelkovich** (1973), *Adjunct Associate Professor of Epidemiology* — M.D., 1958 (University of Belgrade, Yugoslavia); M.P.H., 1963, Dr.P.H., 1969 (Johns Hopkins University)
- Richard N. L. Andrews** (1981), *Professor of Environmental Sciences and Engineering, Professor of City and Regional Planning, Professor of Health Policy and Administration* — A.B., 1966, M.R.P., 1970 (Yale University); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- Marilyn Kay Asay** (1980), *Adjunct Instructor of Public Health Nursing* — Diploma, 1964 (Nebraska Methodist Hospital School of Nursing); B.S., 1964 (Nebraska Wesleyan University); M.S., 1980 (The University of North Carolina at Chapel Hill)
- Delton Atkinson** (1989), *Adjunct Instructor of Biostatistics* — B.A., 1974, M.P.H., 1976, M.P.H., 1979 (The University of North Carolina at Chapel Hill)
- Jan R. Atwood** (1991), *Professor of Public Health Nursing and Health Behavior and Health Education* — B.S.N., 1964, M.P.H., 1967 (University of Michigan); M.A., 1974, Ph.D., 1976 (University of Arizona)
- Thomas J. Bacon** (1976), *Adjunct Associate Professor of Health Policy and Administration* — M.A., 1971 (University of Chicago); Dr.P.H., 1977 (The University of North Carolina at Chapel Hill)
- James D. Bader** (1986), *Adjunct Associate Professor of Health Policy and Administration* — B.S., 1966; D.D.S., 1970; M.P.H., 1973; and Certificate, Dental Public Health, 1974 (University of Michigan)
- Donna D. Baird** (1986) *Adjunct Assistant Professor of Epidemiology* — B.A., 1968 (MacLester College, St. Paul, MN); Ph.D., 1980 (University of Minnesota); M.P.H., 1984 (The University of North Carolina at Chapel Hill)
- Louise M. Ball** (1984), *Assistant Professor of Environmental Sciences and Engineering* — B.Sc., 1972 (University of Bristol, England); Ph.D., 1976 (St. Mary's Hospital Medical School, University of London)
- Shrikant Ishver Bangdiwala** (1980); *Research Associate Professor of Biostatistics* — B.S., 1975, M.S., 1978, Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- Ralph S. Baric** (1986), *Assistant Professor of Epidemiology* — B.S., 1977; and Ph.D., 1982 (North Carolina State University at Raleigh)
- Howard Barnhill** (1973), *Clinical Professor of Health Behavior and Health Education Emeritus* (1983), — B.S., 1938 (A & T State University); M.S.P.H., 1958 (North Carolina Central)
- Harriet Hylton Barr** (1965), *Clinical Associate Professor of Health Behavior and Health Education and Assistant Dean of Alumni Affairs and Public Relations*, — A.B., 1945 (Duke University); M.P.H., 1948 (The University of North Carolina)
- Carolyn J. Barrett** (1977), *Clinical Assistant Professor of Nutrition* — B.S., 1970 (Pennsylvania State University); M.S., 1972 (University of Kansas); M.P.H., 1977 (Tulane University)
- Patricia Z. Barry**, (1972), *Associate Professor of Health Policy and Administration* — B.A., 1957 (Stanford University); M.A., 1960 (University of California); Dr.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Karl E. Bauman** (1966), *Professor of Health Behavior and Health Education* — A.B., 1961, M.A., 1963 (University of Nebraska); Ph.D., 1965 (Florida State University)
- William Fred Baxter** (1979), *Lecturer of Health Policy and Administration* — A.B., 1952 (Guilford College); M.Ed., 1957 (The University of North Carolina at Greensboro); C.A.S.E., 1965 (Johns Hopkins University)
- James D. Beck** (1989), *Adjunct Professor of Epidemiology and Professor of Dental Ecology* — A.B., 1964, M.S., 1967, Ph.D., 1969, (The University of North Carolina at Chapel Hill)
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- Mary A. Beck** (1990) *Adjunct Instructor of Health Policy and Administration* – B.A., 1969 (Ohio State University); M.P.H., 1971 (University of Michigan)
- Mary Caroline Becker** (1965), *Associate Professor of Epidemiology Emerita (1990)* – A.B., 1946 (Vanderbilt University); M.D., 1950 (Johns Hopkins University)
- Deborah E. Bender** (1976), *Research Associate Professor of Health Policy and Administration* – B.A., 1969 (Boston College); Ph.D., 1980 (The American University); M.P.H., 1981 (The University of North Carolina at Chapel Hill)
- Michael A. Berry** (1986), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.S., 1965; M.S., 1969 (Gonzaga University, Spokane, WA); M.S., 1974 (Duke University); Ph.D., 1984 (The University of North Carolina at Chapel Hill)
- Helen T. Bhattacharyya** (1988), *Adjunct Associate Professor of Biostatistics* – B.A., 1960 (Swarthmore College); M.S., 1962 (North Carolina State University at Raleigh); Ph.D., 1973 (The University of North Carolina at Chapel Hill)
- Pouru P. Bhiwandiwala** (1980), *Adjunct Associate Professor of Maternal and Child Health* – M.B., 1968, B.S., 1968 (Bombay University); M.C.P.S., 1969, D.G.O., 1971, D.F.P., 1972, F.C.P.S., 1973 (College of Physicians and Surgeons); M.D., 1973 (Bombay University); M.S.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Richard E. Bilsborrow** (1972), *Research Professor of Biostatistics* – B.A., 1963 (Carleton College); M.A., 1966, Ph.D., 1968 (University of Michigan)
- Linda S. Birnbaum** (1980), *Adjunct Professor of Environmental Sciences and Engineering* – B.A., 1967 (University of Rochester); M.S., 1969, Ph.D., 1972 (University of Illinois)
- Susan Blalock** (1987), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1976, M.P.H., 1980 (University of Michigan); Ph.D., 1987 (The University of North Carolina at Chapel Hill)
- Dan G. Blazer** (1986), *Adjunct Professor of Epidemiology* – B.A., 1965 (Vanderbilt University); M.D., 1969 (University of Tennessee); M.P.H., 1979; Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- Marvin Jerrold Block** (1972), *Associate Professor of Dental Oncology, School of Dentistry and Adjunct Associate Professor Health Policy and Administration, School of Public Health* – B.S., 1943, D.D.S., 1946 (Ohio State University); M.P.H., 1972 (University of Minnesota)
- Ralph H. Boatman, Jr.** (1960), *Professor of Health Behavior and Health Education, School of Public Health, Director of the Office of Continuing Education in the Health Sciences* – B.S.Ed., 1943 (Southern Illinois University); M.P.H., 1947, Ph.D., 1954 (The University of North Carolina)
- Brian A. Boehlecke** (1982), *Clinical Associate Professor of Epidemiology* – B.S., 1966 (Cornell University); M.D., 1970 (State University of New York at Buffalo); M.S.P.H., 1981 (The University of North Carolina at Chapel Hill)
- Mary Bobbitt-Cooke** (1988), *Adjunct Instructor of Health Behavior and Health Education* – B.A., 1966 (Washington University at St. Louis); M.P.H., 1986 (The University of North Carolina at Chapel Hill)
- Kenneth A. Bollen** (1985), *Adjunct Professor of Health Policy and Administration* – B.A., 1973 (Drew University); M.A., 1975, Ph.D., 1977 (Brown University)
- Kerrie E. Boyle** (1989), *Adjunct Assistant Professor of Biostatistics* – B.S., 1974 (Fairfield University); M.S., 1976 (Georgetown University); Dr.P.H. 1986 (The University of North Carolina at Chapel Hill)
- Lou K. Brewer** (1987), *Lecturer of Public Health Nursing* – B.S., 1971, M.P.H., 1977 (The University of North Carolina at Chapel Hill)
- John Briscoe** (1981), *Adjunct Associate Professor of Environmental Engineering* – B.S., 1969 (University of Capetown South Africa); M.S., 1972, Ph.D., 1976 (Harvard University)
- W. Eugene Broadhead** (1987), *Adjunct Assistant Professor of Epidemiology* – B.S., 1977 (Davidson College); M.P.H., 1980 (The University of North Carolina at Chapel Hill); M.D., 1981 (Duke University); Ph.D., 1987 (The University of North Carolina at Chapel Hill)
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- Edward F. Brooks** (1972), *Associate Vice Chancellor for Health Affairs and Adjunct Assistant Professor of Health Policy and Administration* – B.A., 1965 (Bates College, Maine); M.B.A., 1967 (Cornell University); Dr.P.H., 1985 (The University of North Carolina at Chapel Hill)
- Dolores S. Brookshire** (1987), *Adjunct Instructor of Public Health Nursing* – B.S.N., 1983 (The University of North Carolina at Greensboro); M.S., 1987 (The University of North Carolina at Chapel Hill)
- J. Trig Brown** (1988), *Adjunct Assistant Professor of Epidemiology* – M.D., 1977 (Washington University); M.P.H., 1987 (The University of North Carolina at Chapel Hill)
- Dorothy C. Browne** (1981), *Associate Professor of Maternal and Child Health* – B.A., 1969 (Bennett College); M.S.W., 1972 (University of Pittsburgh); M.P.H., 1974, Dr.P.H., 1980 (Harvard University)
- Rebecca Broach Bryan** (1959), *Associate Professor of Nutrition, Emerita (1977)* – B.S., 1934, M.S., 1944 (University of Georgia); M.P.H., 1952 (The University of North Carolina)
- Marjorie G. Busby** (1990) *Adjunct Assistant Professor of Nutrition* – B.A., 1978 (University of North Carolina at Charlotte); M.P.H., 1981 (The University of North Carolina at Chapel Hill)
- Douglas S. Campbell** (1989), *Adjunct Assistant Professor of Epidemiology* – A.B., 1968 (Carleton College); M.D., 1977 (University of Hawaii); M.P.H., 1985 (The University of North Carolina at Chapel Hill)
- Moses Carey, Jr.** (1981), *Adjunct Assistant Professor of Health Policy and Administration* – M.S.P.H., 1972, J.D., 1980 (The University of North Carolina at Chapel Hill)
- Daniel E. Carroll** (1989), *Adjunct Professor of Nutrition* – B.S., 1967 (University of Massachusetts); Ph.D., 1967, (VPI and State University)
- Elmer F. Chaffee** (1966), *Associate Professor of Parasitology and Laboratory Practice, Emeritus (1976)* – B.S., 1938 (Idaho); M.S.P.H., 1947 (The University of North Carolina); Ph.D., 1952 (Duke University)
- Lloyd E. Chambless** (1981), *Research Associate Professor of Biostatistics* – A.B., 1964, (University of Florida, Gainesville); M.A. 1969 (University of Illinois, Urbana); Ph.D., 1979, (The University of North Carolina at Chapel Hill)
- Edward L. Chaney** (1979), *Professor of Radiological Hygiene, Department of Environmental Sciences and Engineering and Professor of Radiation Oncology, School of Medicine* – B.S., 1965 (Millsaps College); Ph.D., 1969 (University of Tennessee)
- Stephen G. Chaney** (1972), *Associate Professor of Nutrition and Associate Professor of Biochemistry* – B.S., 1966 (Duke University); Ph.D.; 1970 (University of California, Los Angeles)
- Emil Theodore Chanlett** (1946), *Professor of Sanitary Engineering, Emeritus (1981)* – B.S., 1937 (College of the City of New York); M.S.P.H., 1939 (Columbia University); M.S.S.E., 1941 (The University of North Carolina)
- M. Judith Charles** (1987), *Research Assistant Professor of Environmental Sciences and Engineering* – B.S., 1974 (University of Vermont); M.S., 1979 (University of Florida); Ph.D., 1984 (University of Michigan)
- Barbara O. Chavious** (1986), *Clinical Instructor of Health Policy and Administration* – B.A., 1968 (Miami University of Ohio); M.P.H., 1985 (The University of North Carolina at Chapel Hill)
- Thomas J. Chegash** (1980), *Adjunct Assistant Professor of Nutrition* – B.S., 1971 (Cornell University); M.B.S., 1977 (George Washington University)
- Sidney Shaw Chipman** (1950), *Professor of Maternal and Child Health, Emeritus (1970)* – B.A., 1924 (Acadia University); M.D., 1928 (McGill University); M.P.H., 1947 (Yale University); D.Sc.Hon., 1971 (Acadia University)
- George Christakos** (1990), *Assistant Professor of Environmental Science* – B.S., 1979, Ph.D., 1986 (National Technical University of Athens); M.Sc., 1980 (University of Birmingham, England); M.S., 1982 (Massachusetts Institute of Technology); Ph.D., 1990 (Harvard University)
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- Russell Fabrique Christman** (1973), *Professor of Environmental Sciences and Engineering* – B.S., 1958, M.S., 1960, Ph.D., 1962 (University of Florida)
- Larry D. Claxton** (1982), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.S., 1967 (Middle Tennessee State University); M.S., 1971 (Memphis State University); Ph.D., 1980 (North Carolina State University at Raleigh)
- Maria Clay** (1989), *Adjunct Instructor of Health Policy and Administration* – B.S., 1972, M.Ed., 1976 (East Carolina University)
- Nora Francis Cline** (1961), *Associate Professor of Public Health Nursing, Emerita* (1978) – R.N., 1945, B.S., 1945 (Duquesne University); M.L., 1947 (University of Pittsburgh)
- Thomas Cole** (1988), *Adjunct Assistant Professor in Epidemiology* – B.A., 1977 (University of Texas at Austin), M.D., 1981 (Baylor College of Medicine); M.P.H., 1988 (University of North Carolina at Chapel Hill)
- Rosalind A. Coleman** (1991), *Professor of Nutrition, School of Public Health and Pediatrics, School of Medicine* – B.A., 1964 (Radcliffe College); M.D., 1969 (Case Western Reserve)
- Gwen W. Collman** (1986), *Adjunct Assistant Professor of Epidemiology* – B.S., 1977 (State University of New York); M.P.H., 1979 (University of Michigan); Ph.D., 1984 (The University of North Carolina at Chapel Hill)
- Warren A. Cook** (1971), *Adjunct Professor of Industrial Health in the Department of Environmental Sciences and Engineering* – A.B., 1923 (Dartmouth College)
- Joan Cornoni-Huntley** (1966), *Adjunct Professor of Epidemiology* – B.A., 1953 (Mary Washington College) M.P.H., 1962, Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Elizabeth Jackson Coulter** (1965), *Professor of Biostatistics Emerita* (1986) – A.B., 1941 (Swarthmore College); A.M. 1946, Ph.D., 1948 (Radcliffe College)
- Douglas J. Crawford-Brown** (1982), *Associate Professor of Environmental Sciences and Engineering* – B.S., 1975, M.S., 1977, Ph.D., 1980 (Georgia Institute of Technology)
- John P. Creason** (1978), *Adjunct Associate Professor of Biostatistics* – B.S., 1964, M.S., 1967 (University of Missouri); Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- John R. Crouse** (1985), *Adjunct Associate Professor of Epidemiology* – B.A., 1961 (University of Michigan); M.D., 1969 (State University of New York)
- Frank V. Crout** (1985), *Adjunct Assistant Professor of Epidemiology* – B.S., 1974 (University of Central Florida); M.S., 1977, M.B.A., 1981, Ph.D., 1981 (University of Kentucky)
- Lester Curtin** (1987), *Adjunct Associate Professor of Biostatistics* – B.S., 1973, Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Nguyen Dat** (1987), *Adjunct Assistant Professor of Biostatistics* – B.S., 1972 (University of Saigon, Vietnam); M.A., 1975, M.S., 1978 (University of Florida); Ph.D., 1982 (The University of North Carolina at Chapel Hill)
- Clarence Edward Davis** (1972), *Professor of Biostatistics* – B.A., 1963 (Howard Payne College); M.S., 1965 (Tulane University); Ph.D., 1970 (North Carolina State University at Raleigh)
- Deborah V. Dawson** (1985), *Adjunct Assistant Professor of Biostatistics and Epidemiology* – B.A., 1974 (Montclair State College, New Jersey); Sc.M., 1976 (John Hopkins University); Ph.D., 1981 (The University of North Carolina at Chapel Hill)
- Leonard H. Dawson** (1966), *Clinical Associate Professor of Health Behavior and Health Education* – A.B., 1960 (University of Kentucky); M.S.P.H., 1963 (The University of North Carolina at Chapel Hill)
- Henry D. Debnam** (1983), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1972 (St. Augustine's College); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Gordon H. DeFriese** (1971), *Professor of Social Administrative Medicine, Clinical Professor of Epidemiology, Adjunct Professor of Health Policy and Administration and Director, Health Services Research Center* – B.S., 1963 (Middle Tennessee State University); M.A., 1966, Ph.D., 1967 (University of Kentucky)
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- David Mahlon DeLong** (1979), *Adjunct Associate Professor of Biostatistics* – B.A., 1969 (University of Maine, Orono); M.S., 1975, Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Elizabeth Ray DeLong** (1979), *Adjunct Assistant Professor of Biostatistics* – B.A. 1969, M.A., 1970 (University of Maine, Orono); Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- David M. DeMarini**, (1991), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.S., 1972; M.S., 1974; Ph.D., 1980 (Illinois State University, Normal)
- John M. Dement** (1981), *Adjunct Associate Professor of Air and Industrial Hygiene* – B.S., 1971 (North Carolina State University at Raleigh); M.S., 1972 (Harvard University); Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- Barbara H. Dennis** (1990), *Research Associate Professor of Nutrition* – B.S., 1955 (University of Utah); M.S., 1959 (University of Wisconsin); Ph.D., 1985 (Virginia Tech University)
- Susan DesHarnais** (1988), *Associate Professor of Health Policy and Administration* – B.A., 1967; M.P.H., 1969; Ph.D., 1983 (University of Michigan at Ann Arbor)
- Brenda McEvoy DeVellis** (1978), *Associate Professor of Health Behavior and Health Education* – B.A., 1969 (University of Massachusetts); M.A., 1973 (Connecticut College); Ph.D., 1978 (George Peabody College)
- Robert DeVellis** (1981), *Research Associate Professor of Health Behavior and Health Education, Assistant Director of Rehabilitation Program, School of Medicine and Research Assistant Professor of Psychology* – B.S., 1970 (University of Massachusetts); M.A., 1973 (Connecticut College-Ct.); Ph.D., 1977 (George Peabody College)
- Francis A. DiGiano** (1981), *Professor of Water Resources Engineering in the Department of Environmental Sciences and Engineering* – B.S.C.E., 1964 (University of Massachusetts); M.S.C.E., 1965 (Tufts University); Ph.D., 1969 (University of Michigan)
- Arlene Diosegy** (1989), *Adjunct Instructor of Health Policy and Administration* – B.A., 1971 (Allegheny College); J.D., 1974 (Temple University)
- James P. Dixon** (1976), *Clinical Professor Health Policy and Administration* – B.S., 1939 (Antioch College); M.D., 1943 (Harvard University); M.S., 1947 (Columbia University)
- Janice M. Dodds** (1989), *Associate Professor of Nutrition and Maternal and Child Health* – B.S., 1963 (Iowa State University); M.Ed., 1965 (Tufts University); Ed.D., 1978 (Columbia University)
- William W. Dow** (1984), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1967, M.D., 1974 (Vanderbilt University)
- George Grundy Dudley** (1967), *Adjunct Professor of Health Policy and Administration* – B.S., 1951 (Tennessee Tech.); D.D.S., 1953 (University of Tennessee); M.P.H., 1962 (The University of North Carolina)
- David W. Dunlop** (1989), *Adjunct Professor of Health Policy and Administration* – B.S., 1965 (University of California, Berkeley); M.A., 1969, Ph.D., 1973 (Michigan State University)
- Michael F. Durfee**, (1977), *Associate Professor of Pediatrics, School of Medicine and Lecturer in Maternal and Child Health, School of Public Health* – B.A., 1959 (University of Ohio); M.D., 1963 (University of Virginia); M.P.H., 1977 (The University of North Carolina at Chapel Hill)
- JoAnne L. Earp** (1975), *Associate Professor of Health Behavior and Health Education* – B.A., 1965 (Bryn Mawr College); Sc.D., 1974 (Johns Hopkins University)
- Elizabeth Merrill Edmands** (1967), *Associate Professor of Public Health Nursing, Emerita (1979)* – R.N., 1936 (Rhode Island Hospital); B.S.P.H.N., 1943 (University of Michigan); M.A., 1955 (Columbia University)
- Joseph Chike Edozien** (1971), *Professor of Nutrition Emeritus (1990)* – B.Sc., 1948, M.Sc., 1950, M.B., B.Ch., 1951, M.D., 1954 (National University of Ireland); M.R.C.P., 1954, F.R.C.P., 1963 (University of Edinburgh); D.Sc., (Hon), 1963 (University of Rio de Janeiro); F.R.C.Path., 1967 (England)
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- Lloyd J. Edwards** (1990), *Visiting Assistant Professor of Biostatistics* – B.A., 1980 (Morehouse College); M.A., 1982 (University of Maryland); Ph.D., 1990 (The University of North Carolina at Chapel Hill)
- Merril Eisenbud** (1984), *Adjunct Professor of Environmental Sciences and Engineering* – B.S.Ed., 1936 (New York University); Sc.D., 1960 (Fairleigh Dickinson University); D.H.C., 1971 (Catholic University of Rio de Janeiro)
- Regina Cecylia Elandt-Johnson** (1964), *Professor of Biostatistics, Emerita* (1985) – M.S., 1946 (University of Poznan, Poland); Ph.D., 1955 (Poznan Agricultural University)
- Eugenia Eng** (1980), *Assistant Professor of Health Behavior and Health Education* – B.S., 1970 (University of Wisconsin); M.P.H., 1978, Dr.P.H., 1983 (The University of North Carolina at Chapel Hill)
- David S. Ensor** (1989), *Adjunct Professor of Environmental Sciences and Engineering* – B.A., 1963 (Washington State University); M.S., 1968, Ph.D., 1972 (University of Washington, Seattle)
- Richard B. Everson** (1988), *Adjunct Professor of Epidemiology* – B.S., 1968, (Trinity College); M.D., 1972 (University of Rochester); M.P.H., 1985 (The University of North Carolina at Chapel Hill)
- Anita Manders Farel** (1973), *Clinical Assistant Professor of Maternal and Child Health* – A.B., 1966 (University of California); M.S.W., 1968 (University of California at Los Angeles); Dr.P.H., 1979 (The University of North Carolina at Chapel Hill)
- MaryAnn C. Farthing** (1978), *Clinical Associate Professor of Nutrition Emerita* (1990) – B.S., 1954 (The North Carolina College for Women at Greensboro); M.S., 1957 (University of Tennessee); Ph.D., 1974 (The University of North Carolina at Greensboro)
- John R. Feussner** (1989), *Adjunct Associate Professor of Health Policy and Administration* – BA., 1968 (University of Pennsylvania); M.D., 1973 (University of Vermont); Ph.D., 1983 (The University of North Carolina at Chapel Hill)
- Laurel A. Files** (1968), *Associate Professor and Associate Chair of Health Policy and Administration* – B.A., 1960 (Hofstra College); M.A., 1963 (Yale University); Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Tekola Fisseha** (1988), *Adjunct Instructor of Health Behavior and Health Education* – B.A., 1977, M.P.H., 1980 (The University of North Carolina at Chapel Hill)
- William Shoemaker Flash** (1964), *Associate Professor of Health Policy and Administration Emeritus, Clinical Associate Professor of Psychiatry, Emeritus* (1985) – A.B., 1948, M.P.A., 1950, Ph.D., 1954 (Harvard University)
- Robert H. Fletcher** (1978), *Adjunct Professor of Epidemiology* – B.A., 1962 (Wesleyan); M.D., 1966 (Harvard University); M.Sc., 1973 (Johns Hopkins University)
- Michael Flynn** (1986), *Assistant Professor of Environmental Sciences and Engineering* – B.S., 1979 (Central Connecticut State University); M.S., 1982; D.S., 1986 (Harvard University)
- Judith A. Fortney** (1987), *Adjunct Associate Professor of Epidemiology* – B.Sc., 1959 (London School of Economics); M.S., 1963 (University of Wisconsin); Ph.D., 1971 (Duke University)
- Vangie A. Foshee** (1990), *Assistant Professor of Public Health Nursing and Health Behavior and Health Education* – B.A., 1982 (University of North Carolina at Wilmington); M.Ed., 1985 (University of North Carolina at Greensboro); Ph.D., 1989 (The University of North Carolina at Chapel Hill)
- Donald Lee Fox** (1973), *Professor of Air Hygiene in the Department of Environmental Sciences and Engineering, Associate Dean for Academic Programs, School of Public Health* – B.S., 1965 (Wichita State University); Ph.D., 1971 (Arizona State University)
- Donald Edward Francisco** (1970), *Lecturer in the Department of Environmental Sciences and Engineering* – B.A., 1964, M.A., 1966 (North Texas State); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Linda J. Frederick** (1991), *Adjunct Assistant Professor of Public Health Nursing* – B.S., 1972, M.S.N., 1977 (University of Cincinnati); Ph.D., 1990 (University of Michigan)
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- Jean G. French** (1989), *Adjunct Professor of Epidemiology* – B.S., 1949 (Cornell University); M.A., 1955 (Columbia University); M.P.H., 1961 (Johns Hopkins University); Dr.Ph., 1965 (University of Michigan)
- Deborah A. Freund** (1979), *Adjunct Professor of Health Policy and Administration* – A.B., 1972 (Washington University); M.P.H., 1974, M.A., 1975, Ph.D., 1980 (University of Michigan)
- Moye Wicks Freymann** (1966), *Professor of Health Policy and Administration* – B.S., 1945 (Yale University), M.D., 1948 (Johns Hopkins University); M.P.H., 1956, Dr.P.H., 1960 (Harvard University)
- Edward L. Frome** (1980), *Adjunct Associate Professor of Biostatistics* – B.S., 1964, M.S., 1966 (University of Florida); Ph.D., 1972 (Emory University)
- John G. Fryer** (1971), *Research Professor of Biostatistics* – B.Sc., 1960; Ph.D., 1964 (University of London)
- Estelle M. Fulp** (1979), *Adjunct Associate Professor of Public Health Nursing* – Diploma in Nursing 1944 (Braddock General Hospital, Penn.); B.S.P.H.N., 1962 (Duquesne University); M.P.H., 1966 (The University of North Carolina at Chapel Hill)
- Philip Gallagher** (1987), *Lecturer of Biostatistics* – S.B., 1957, (Massachusetts Institute of Technology); M.Sc., 1963 (University of London, England)
- Sanford C. Garner** (1990), *Visiting Assistant Professor of Nutrition* – BA., 1972, Ph.D., 1989 (The University of North Carolina at Chapel Hill)
- Joanne M. Garrett** (1990), *Adjunct Research Instructor of Epidemiology* – A.B., 1969, M.S.P.H., 1978, Ph.D., 1990 (The University of North Carolina at Chapel Hill)
- Rose Geraldine George** (1966), *Associate Professor, Emerita, of the School of Nursing, and Assistant Professor, Emerita, School of Public Health (1980)* – Dip. Nursing, 1941 (Massachusetts Memorial Hospital, Boston); R.N., B.S., 1951 (Wayne State); M.S., 1966 (The University of North Carolina at Chapel Hill)
- Benjamin Gilbert** (1982), *Clinical Assistant Professor of Health Policy and Administration* – B.G.S., 1972 (University of Michigan); M.P.H., 1976, J.D., 1979 (The University of North Carolina at Chapel Hill)
- William H. Glaze** (1989), *Professor and Chair of the Department of Environmental Sciences and Engineering* – B.S., 1956 (Southwestern University); M.S., 1958, Ph.D., 1961 (University of Wisconsin, Madison)
- Avram Gold** (1979), *Professor of Environmental Sciences and Engineering* – B.A., 1963, Ph.D., 1969, M.S., 1973 (Harvard University)
- Marsha Gold** (1986), *Adjunct Assistant Professor of Health Policy and Administration* – B.S., 1969 (Cornell University); M.S., 1971 (Massachusetts Institute of Technology); M.P.H., 1976 (University of California, Berkeley); S.D., 1979 (Harvard University)
- Hilton Thomas Goulson** (1957), *Professor of Parasitology and Laboratory Practice* – A.B., 1952 (Luther College, Iowa); M.S.P.H., 1953, Ph.D., 1957 (The University of North Carolina)
- Geraldine Gourley** (1963), *Associate Professor of Maternal and Child Health, Emerita (1980)* – Ph.B., 1935 (Washburn University); M.S.S.W., 1942 (University of Chicago)
- Richard C. Graves** (1986), *Research Professor of Epidemiology, Clinical Professor of Health Policy and Administration* – D.D.S., 1954; M.P.H., 1969; Dr.P.H. 1971 (University of Michigan)
- Sue M. Gray** (1985), *Adjunct Instructor of Health Behavior and Health Education* – B.A., 1972 (University of Missouri); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Raymond S. Greenberg** (1984), *Adjunct Associate Professor of Epidemiology* – B.A., 1976 (The University of North Carolina at Chapel Hill); M.P.H., 1979 (Harvard University); M.D., 1979 (Duke University); Ph.D., 1983 (The University of North Carolina at Chapel Hill)
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- Sandra B. Greene** (1978), *Adjunct Associate Professor of Biostatistics* – B.A., 1971, M.S.P.H., 1972, Dr.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Betty B. Griffith** (1989), *Adjunct Assistant Professor of Public Health Nursing* – B.S., 1974 (Winston-Salem State University); M.A., 1976 (Appalachian State University)
- Jack D. Griffith** (1987), *Adjunct Professor of Epidemiology* – Ph.D., 1969 (University of Oklahoma)
- James Ennis Grizzle** (1960), *Professor Emeritus of Biostatistics* (1989) – B.S., 1951 (Berea College); M.S., 1953 (Virginia Polytechnic Institute); Ph.D., 1960 (North Carolina State University at Raleigh)
- Harry Guess** (1988), *Adjunct Professor of Epidemiology and Biostatistics* – B.S., M.S., 1964 (Georgia Tech University); Ph.D., 1972 (Stanford University); M.D., 1979 (University of Miami)
- Priscilla Alden Guild** (1971), *Adjunct Instructor of Biostatistics, Research Associate, Health Services Research Center* – B.S., 1966 (Wilson College); M.S.P.H., 1971 (The University of North Carolina at Chapel Hill)
- Frances Osborne Gust** (1962), *Assistant Professor of Health Policy and Administration, Emerita* (1971) – A.B., 1929 (Guilford College); M.P.H., 1956 (The University of North Carolina)
- Pamela Haines** (1983), *Assistant Professor of Nutrition* – B.S., 1970 (Cornell University); M.S., 1977 (University of Florida); Dr.P.H., 1982 (The University of North Carolina at Chapel Hill)
- James E. Hall** (1982), *Associate Professor of Epidemiology* – B.S., 1971; M.S., 1974 (University of New Orleans); Ph.D., 1979 (Texas A & M)
- Curtis G. Hames** (1978), *Clinical Professor of Epidemiology* – B.S., 1941, M.D., 1944 (University of Georgia)
- Philip E. Hamrick** (1984), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.A., 1961, M.S., 1962 (North Carolina State University); Ph.D., 1968 (Medical College of Virginia)
- Ann Caton Hansen** (1958), *Associate Professor of Public Health Nursing, Emerita* (1970) – B.S., 1952 (Johns Hopkins University); M.P.H., 1956 (The University of North Carolina)
- Sioban D. Harlow** (1988), *Research Assistant Professor of Epidemiology* – B.A., 1980 (University of California, Berkeley); Ph.D., 1988 (Johns Hopkins University)
- Charles L. Harper** (1966) *Professor of Health Behavior and Health Education, Emeritus* (1984) – B.A., 1949, M.S.P.H., 1950 (The University of North Carolina); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- William Harper** (1982), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1971 (West Virginia University); M.A., 1974 (Marshall University); J.D., 1981 (Campbell University)
- Frank E. Harrell, Jr.** (1980), *Adjunct Associate Professor of Biostatistics* – B.S., 1973 (University of Alabama); Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Robert L. Harris, Jr.** (1973), *Professor of Environmental Sciences and Engineering Emeritus* (1989) – B.S.Ch.E., 1949 (University of Arkansas); M.S., 1954 (Harvard University); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- Russell P. Harris** (1988), *Adjunct Assistant Professor of Epidemiology* – B.A., 1967, M.D., 1970 (Johns Hopkins University); M.P.H., 1987 (The University of North Carolina at Chapel Hill)
- Abraham G. Hartzema** (1984), *Clinical Associate Professor of Health Policy and Administration and Associate Professor, School of Pharmacy* – B.Sc., 1974, Pharm.D., 1976 (University of Utrecht); M.S.P.H., 1978 (University of Washington); Ph.D., 1982 (University of Minnesota)
- James Ronald Hass** (1975), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.A., 1967 (Appalachian State University); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
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- Carl G. Hayes** (1969), *Adjunct Professor of Epidemiology* – B.S., 1955 (Mercer University); M.P.H., 1963, Ph.D., 1969 (The University of North Carolina at Chapel Hill)
- Sandra Headen** (1988), *Research Assistant Professor of Health Behavior and Health Education* – B.A., 1969 (Bennett College); M.A., 1974, Ph.D., 1982 (Boston College)
- Milton Sydney Heath, Jr.** (1957), *Professor of Public Law and Government and Professor of Water Resources in the Department of Environmental Sciences and Engineering* – A.B., 1949 (Harvard University); LL.B., 1952 (Columbia University)
- Gerardo Heiss** (1976), *Professor of Epidemiology* – M.D., 1968 (University of Chile); M.Sc.S.M., 1973 (London); Ph.D., 1976 (The University of North Carolina at Chapel Hill)
- William D. Heizer** (1970), *Professor of Nutrition, School of Public Health and Professor of Medicine, School of Medicine* – A.B., 1958 (King College, Tennessee); M.D., 1963 (The Johns Hopkins University)
- Ronald William Helms** (1968), *Professor of Biostatistics* – B.A., 1963, M.A., 1966 (University of Tennessee); Ph.D., 1969 (North Carolina State University at Raleigh)
- James Richard Hendricks** (1949), *Associate Professor of Parasitology and Laboratory Practice, Emeritus (1984)* – B.S., 1940 (Guilford College); M.S., 1948, Ph.D., 1951 (The University of North Carolina)
- O. Marie Henry** (1981), *Adjunct Associate Professor of Public Health Nursing* B.S.N., 1964 (University of Virginia); M.S.N., 1971, D.N.S.C., 1975 (The Catholic University of America)
- William Theodore Herzog** (1964), *Associate Professor of Health Policy and Administration* – B.A., 1955 (Knox College); M.S.P.H., 1958 (The University of North Carolina)
- Irva Hertz-Picciotto** (1990), *Assistant Professor of Epidemiology* – A.B., 1970, M.P.H., 1984, M.A., 1985, Ph.D., 1989 (University of California, Berkeley)
- Siegfried H. Heyden** (1967), *Adjunct Professor of Epidemiology* – M.D., 1951 (University of Berlin); Ph.D., 1966 (University of Zurich)
- John L. S. Hickey** (1979), *Research Associate Professor Emeritus (1987) and Adjunct Associate Professor of Air and Industrial Hygiene in the Department of Environmental Sciences and Engineering* – B.S.C.E., 1948 (Texas Tech University); M.S.S.E., 1949 (Harvard University); M.S.P.H., 1974, Ph.D., 1977 (The University of North Carolina at Chapel Hill)
- James Everett Higgins** (1982), *Adjunct Assistant Professor of Epidemiology* – B.S., 1967 (North Carolina State University at Raleigh); M.S., 1969 (Cornell University); Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Marion E. Highriter** (1968), *Associate Professor and Deputy Chair for Student Affairs, Curriculum of Public Health Nursing and Associate Professor in Nursing* – B.A., 1950 (Mount Holyoke College); M.N., 1953 (Yale University); M.P.H., 1958, D.Sc., 1969 (Harvard University)
- Godfrey Hochbaum** (1972), *Professor of Health Behavior and Health Education Emeritus* (1988) – B.A., 1947 (American University); M.A., 1949 (George Washington University); Ph.D., 1953 (University of Minnesota)
- David Gerhard Hoel** (1971), *Adjunct Professor of Biostatistics* – A.B., 1961 (University of California, Los Angeles); Ph.D., 1966 (The University of North Carolina at Chapel Hill)
- Michael Hogan** (1975), *Adjunct Associate Professor of Epidemiology* – B.A., 1960 (De Pauw University); M.S., 1964, M.P.H., 1965, Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Joseph L. Holliday** (1977), *Adjunct Professor of Maternal and Child Health* – A.B., 1969 (The University of North Carolina at Chapel Hill); M.D., 1973 (Vanderbilt University); M.P.H., 1975 (The University of North Carolina at Chapel Hill)
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- Daniel Goodman Horvitz** (1973), *Adjunct Professor of Biostatistics* – B.S., 1943 (University of Massachusetts); Ph.D., 1953 (Iowa State University)
- James D. Hosking** (1980), *Research Associate Professor of Biostatistics* – B.S., 1974 (Georgia Institute of Technology); M.A., 1978, Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- Richard M. House** (1980), *Associate Dean and Director of Community Health Service and Clinical Associate Professor of Health Behavior and Health Education* – B.S., 1963 (East Carolina University); M.P.H., 1969 (The University of North Carolina at Chapel Hill); Ed.D., 1983 (North Carolina State University at Raleigh)
- David H. Howells** (1967), *Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering, Emeritus (1976)* – B.S.C.E., 1949 (Oregon State University); M.S.S.E., 1955 (Massachusetts Institute of Technology)
- Maynard Michael Hufschmidt** (1965), *Professor of City and Regional Planning and Professor of Environmental Sciences and Engineering, Emeritus (1979)* – B.S., 1939 (University of Illinois); M.P.A., 1955, D.P.A., 1964 (Harvard University).
- John Thomas Hughes** (1960), *Professor of Health Policy and Administration, School of Public Health and Professor of Ecology, School of Dentistry, Emeritus (1982)* – B.S., 1940 (Wake Forest University); D.D.S., 1947 (University of Maryland); M.P.H., 1958, Dr.P.H., 1962 (The University of North Carolina at Chapel Hill)
- Barbara S. Hulka** (1967), *Kenan Professor and Chair of Epidemiology, School of Public Health and Clinical Associate Professor of Family Medicine, School of Medicine* – B.A., 1952 (Radcliffe College); M.S., 1954 (Juilliard School of Music); M.D., 1959, M.P.H., 1961 (Columbia University)
- Jaroslav Fabian Hulka** (1966), *Professor of Obstetrics and Gynecology, School of Medicine and Maternal and Child Health, School of Public Health* – B.S., 1952 (Harvard University); M.D., 1956 (Columbia University)
- Nancy Spruill Hunter** (1984), *Adjunct Assistant Professor of Epidemiology* – B.A., 1958 (Meredith College); M.P.H., 1972, Dr.P.H., 1980 (The University of North Carolina at Chapel Hill)
- Robert R. Huntley** (1989), *Adjunct Professor of Health Policy and Administration* – B.S., 1947 (Davidson College); M.D., 1951 (Bowman Gray School of Medicine)
- Michel A. Ibrahim** (1969), *Professor of Epidemiology and Dean, School of Public Health* – M.D., 1957 (University of Cairo); M.P.H., 1961, Ph.D., 1964 (The University of North Carolina at Chapel Hill)
- Ethel Jackson** (1980), *Clinical Instructor of Health Behavior and Health Education* – B.S., 1960 (Bennett College); M.P.H., 1973 (The University of North Carolina at Chapel Hill)
- Rodney J. Jackson** (1990), *Adjunct Assistant Professor of Epidemiology* – B.S.C., 1974, M.B.Ch.B., 1978, Dip.Obs., 1980, M.Med.Sc., 1984, Ph.D., 1989 (University of Auckland, New Zealand); D.Com.H., 1983 (University of Otago, New Zealand)
- Howard Newman Jacobson** (1978), *Clinical Professor of Maternal and Child Health Emeritus (1988)* – B.Sc., 1947, B.M., 1950, M.D., 1951 (Northwestern University Medical School)
- Sagar C. Jain** (1965), *Professor of Health Policy and Administration* – B.A., 1950, M.A., 1952 (Delhi University); A.M., 1960 (University of Illinois); Ph.D., 1964 (Cornell University)
- Sherman A. James** (1973), *Adjunct Professor of Epidemiology* – A.B., 1964 (Talladega College, Alabama); Ph.D., 1973 (Washington University)
- Joseph M. Janis** (1981), *Adjunct Assistant Professor of Biostatistics* – B.S., 1957, M.S., 1961 (University of Pittsburgh); A.B., 1967 (St. Louis University); Ph.D., 1981 (The University of North Carolina at Chapel Hill)
- Harvey Edward Jeffries** (1970), *Professor of Air Hygiene in the Department of Environmental Sciences and Engineering* – B.S., 1964 (Florida Presbyterian); M.S.P.H., 1967, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
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- William F. Jessee** (1980), *Adjunct Professor of Health Policy and Administration and Social and Administrative Medicine* — A.B., 1968 (Stanford University); M.D., 1972 (University of California, San Diego)
- Eric Johnson** (1988), *Adjunct Assistant Professor of Epidemiology* — M.B., B.S., 1970 (University of Newcastle-Upon-Tyne England); D.T.P.H., 1972 (University of London, England); M.P.H., 1977 (Harvard University); Ph.D., 1984 (Johns Hopkins University)
- J. Donald Johnson** (1961), *Professor of Environmental Chemistry in the Department of Environmental Sciences and Engineering Emeritus* (1990) — B.S., 1957 (University of California, Los Angeles); Ph.D., 1962 (The University of North Carolina)
- Lorraine Johnson** (1990), *Clinical Assistant Professor of Public Health Nursing and Adjunct Assistant Professor of Epidemiology, School of Public Health and Clinical Assistant Professor of Dermatology, School of Medicine* — B.S., 1970 (University of Pennsylvania); M.A., 1976 (Marywood College); M.P.H., 1979, Ph.D., 1986 (The Johns Hopkins University School of Hygiene and Public Health)
- Richard Eugene Johnston** (1973), *Professor of Radiology and Professor of Environmental Sciences and Engineering* — B.S., 1956 (University of Akron); M.S., 1958, Ph.D., 1968 (Vanderbilt University)
- William Dean Kalsbeek** (1978), *Associate Professor of Biostatistics* — B.A., 1968 (Northwestern College, Iowa); M.P.H., 1970, Ph.D., 1973 (University of Michigan)
- Arnold Daniel Kaluzny** (1967), *Professor of Health Policy and Administration* — B.S., 1960 (University of Wisconsin); M.H.A., 1962, Ph.D., 1967 (University of Michigan)
- Richard M. Kamens** (1984), *Research Professor of Environmental Sciences and Engineering* — A.A.S., 1963 (Orange County Community College); B.A., 1965 (State University of New York at Buffalo); M.S.P.H., 1971 (The University of North Carolina at Chapel Hill)
- Berton H. Kaplan** (1960), *Professor of Epidemiology* — B.S., 1951 (Virginia Polytechnic Institute); M.S., 1952, Ph.D., 1962 (The University of North Carolina)
- Mildred Kaufman** (1977), *Professor of Nutrition Emerita* (1990) — B.S., 1947 (Simmons College); M.S., 1952 (Columbia University Teachers College)
- Ulrich Keil** (1989), *Adjunct Professor of Epidemiology* — M.D., 1971 (University of Heidelberg); M.P.H., 1971 (University of California, Los Angeles); Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- John C. Key** (1971), *Adjunct Assistant Professor of Health Behavior and Health Education* — B.S., 1963 (North Carolina State University at Raleigh); M.S.P.H., 1964 (The University of North Carolina at Chapel Hill); M.S.W., 1970, Ph.D., 1972 (Brandeis University)
- Amin Khalil** (1983), *Adjunct Assistant Professor of Health Behavior and Health Education* — B.S., 1966, M.S., 1968 (East Tennessee State University); M.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Kerry E. Kilpatrick** (1987), *Professor and Chair of Health Policy and Administration* — B.S.E., 1963 (University of Michigan); M.B.A., 1963 (Harvard University); M.S., 1967, Ph.D., 1970 (University of Michigan)
- Jean E. Kincaide-Norburn** (1990), *Assistant Professor of Public Health Nursing and Health Policy and Administration* — B.S.N., 1968 (University of Saskatchewan); M.N., 1972 (University of Florida); Ph.D., 1979 (Brown University)
- Betty George Kirkley** (1984), *Assistant Professor of Nutrition* — A.B., 1976 (The University of North Carolina at Chapel Hill); Ph.D., 1982 (Washington University)
- David Klein** (1987), *Adjunct Professor of Health Behavior and Health Education* — B.A., 1940 (City College of New York); M.A., (Columbia University)
- David G. Kleinbaum** (1970), *Professor of Biostatistics and Epidemiology* — A.B., 1962 (Hamilton College); A.M., 1964 (University of Rochester); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Lynn K. Knauff** (1970), *Adjunct Assistant Professor of Maternal and Child Health* — B.A., 1957 (St. Lawrence University); M.P.H., 1970 (The University of North Carolina at Chapel Hill)
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- Gary Grove Koch** (1967), *Professor of Biostatistics* — B.S., 1962, M.S., 1963 (Ohio State University); Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Jeffrey S. Koeze** (1987), *Adjunct Assistant Professor of Health Policy and Administration and Assistant Professor, Institute of Government* — B.A., 1982 (The University of North Carolina at Chapel Hill); J.D., 1986 (University of Virginia School of Law)
- Thomas Robert Konrad** (1978), *Research Associate Professor of Dental Ecology and Health Services Research, School of Dentistry and Health Policy and Administration, School of Public Health* — B.A., 1966 (University of Santa Clara); M.A., 1970, Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Jacob Koomen, Jr.** (1959), *Professor of Health Policy and Administration, Emeritus* (1985) — B.S., 1939, M.D., 1945 (University of Rochester); M.P.H., 1957 (The University of North Carolina)
- Mark J. Koruda** (1988), *Assistant Professor of Nutrition and Assistant Professor of Surgery* — B.S., 1977 (Boston College); M.D., 1981 (Yale University)
- Jonathan Bruce Kotch** (1978), *Associate Professor of Maternal and Child Health* — B.A., 1968 (Columbia College); M.D., 1973 (Stanford University); B.A., 1974 (Cambridge University); M.P.H., 1977 (The University of North Carolina at Chapel Hill); M.A., 1978 (Cambridge University)
- Milton Kotelchuck** (1988), *Associate Professor and Chair of Maternal and Child Health* — B.A., 1967 (Johns Hopkins University); M.A., 1968, Ph.D., 1972, M.P.H., 1975 (Harvard University)
- Mary G. Kovar** (1988), *Adjunct Professor of Health Policy and Administration* — B.S., 1951, M.S., 1955 (University of Pittsburgh); Ph.D., 1982 (The University of North Carolina at Chapel Hill)
- Edward J. Kuenzler** (1965), *Professor of Environmental Biology in the Department of Environmental Sciences and Engineering* — B.S., 1951 (University of Florida); M.S., 1953, Ph.D., 1959 (University of Georgia)
- Lawrence Louis Kupper** (1970), *Professor of Biostatistics* — B.S., 1961 (University of Maryland); M.S., 1965 (University of Florida); Ph.D., 1970, (The University of North Carolina at Chapel Hill)
- James C. Lamb III** (1959), *Professor of Sanitary Engineering Emeritus (1987) in the Department of Environmental Sciences and Engineering* — B.S.C.E., 1947 (Virginia Military Institute); M.S., 1948, S.E., 1952, ScD., 1953 (Massachusetts Institute of Technology)
- Peter R. Lamptey** (1987), *Adjunct Assistant Professor of Maternal and Child Health* — M.B., Ch.B., M.D., 1971 (University of Ghana Medical School); M.P.H., 1975 (University of California at Los Angeles); Diploma, 1980 (Massachusetts Institute of Technology); Dr.P.H., 1980 (Harvard University)
- Suzanne E. Landis** (1986), *Research Assistant Professor of Epidemiology* — B.S., 1974 (Muhlenberg College, Pennsylvania); M.D., 1978 (University of Pennsylvania); M.P.H., 1986 (The University of North Carolina at Chapel Hill)
- John Edgar Larsh, Jr.** (1943), *Professor of Parasitology and Laboratory Practice, Emeritus (1981)* — B.A., 1939, M.S., 1940 (University of Illinois); Sc.D., 1943 (Johns Hopkins University)
- Donald Thomas Lauria** (1965), *Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering, Acting Director, Office of International Public Health Programs* — B.C.E., 1956 (Manhattan College); M.S.S.E., 1965 (Syracuse University); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Lisa M. LaVange** (1989), *Adjunct Assistant Professor of Biostatistics* — B.A., 1974 (University of North Carolina at Chapel Hill); M.A., 1976 (University of Massachusetts); Ph.D., 1983 (University of North Carolina at Chapel Hill)
- Therese P. Lawler** (1977), *Adjunct Assistant Professor of Public Health Nursing* — B.S.N., 1957 (Georgetown University); M.S., 1972 (East Carolina University); M.P.H., 1986 (The University of North Carolina at Chapel Hill); Ed.D., 1982 (North Carolina State University at Raleigh)
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- John J. Lee** (1988), *Clinical Associate Professor of Health Policy and Administration* – B.S., 1956 (Merrimack College); M.B.A., 1970 (University of Florida at Gainesville)
- Kerry Lamont Lee** (1975), *Adjunct Associate Professor of Biostatistics* – B.S., 1965 (University of Utah); M.S., (Stanford University); Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- David H. Leith** (1984), *Professor of Environmental Sciences and Engineering* – B.S., 1970, M.S., 1970 (University of Cincinnati); D.S., 1975 (Harvard University)
- Judith T. Lessler** (1981), *Adjunct Associate Professor of Biostatistics* – B.A., 1966 (The University of North Carolina at Chapel Hill); M.A.T., 1967 (Emory University); Ph.D., 1974 (The University of North Carolina at Chapel Hill)
- Richard J. Levine** (1984), *Adjunct Associate Professor of Epidemiology* – A.B., 1960 (Princeton University); M.S., 1964 (California Institute of Technology) M.D., 1971 (St. Louis University); M.P.H., 1976 (Harvard University)
- Ronald H. Levine** (1980), *Adjunct Professor of Health Policy and Administration* – B.S., 1955 (Union College); M.D., 1959 (State University of New York); M.P.H., 1967 (The University of North Carolina at Chapel Hill)
- Linda West Little** (1971), *Adjunct Associate Professor of Environmental Biology in the Department of Environmental Sciences and Engineering* – B.A., 1959 (Women's College, North Carolina); M.S.P.H., 1962, Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Frank Aloysius Loda, Jr.** (1967), *Professor of Pediatrics and Adjunct Professor of Maternal and Child Health* – A.B., 1956 (Harvard University); M.D., 1960 (Vanderbilt University)
- Robert A. Loddengaard** (1972), *Clinical Professor of Health Policy and Administration Emeritus* (1988) – B.E.E., 1949 (City College of New York); M.S.P.H., 1971 (The University of North Carolina at Chapel Hill)
- John B. Longenecker** (1989), *Clinical Professor of Nutrition and Director, Institute of Nutrition* – B.A., 1952 (Franklin and Marshall College); M.A., 1954, Ph.D., 1956 (University of Texas)
- Laureen Lopez** (1988), *Assistant Professor of Nutrition* – B.S., 1976 (Douglass College, Rutgers University); M.S., 1979 (Rutgers University); Ph.D., 1984 (Cornell University)
- Dana P. Loomis** (1989), *Research Assistant Professor of Epidemiology* – B.A., 1978 (Oberlin College); M.S., 1985, M.S.P.H., 1986, Ph.D., 1989 (The University of North Carolina at Chapel Hill)
- Gory J. Love** (1973), *Adjunct Associate Professor of Epidemiology* – B.S., 1949 (University of Georgia); M.P.H., 1959, D.Sc., 1961 (University of Pittsburgh)
- James W. Luckey** (1980), *Adjunct Associate Professor of Health Policy and Administration* – B.A., 1972 (University of Colorado); Ph.D., 1978 (University of Nebraska-Lincoln)
- Richard A. Luettich, Jr.** (1986), *Adjunct Assistant Professor of Environmental Engineering* – B.C.E., 1979, M.S., 1981 (Georgia Institute of Technology); Sc.D., 1987 (Massachusetts Institute of Technology)
- John C. Lumsden** (1980), *Adjunct Professor of Environmental Sciences and Engineering* – B.S., 1947 (North Carolina State University)
- Anders S. Lunde** (1968), *Adjunct Professor of Biostatistics* – B.A., 1938 (St. Lawrence University); M.A., 1947, Ph.D., 1955 (Columbia University)
- Frances Lynn** (1985), *Research Associate Professor of Environmental Sciences and Engineering* – B.A., 1966 (Goucher College); Master of International Affairs, 1969 (Columbia University); Dr.P.H., 1983 (The University of North Carolina at Chapel Hill)
- John Newton MacCormack** (1979), *Adjunct Professor of Epidemiology* – B.A., 1958 (Duke University); M.D., 1962, M.P.H., 1968 (The University of North Carolina at Chapel Hill)
- Neil E. Mackenzie** (1983), *Adjunct Associate Professor of Epidemiology (Field)* – Bc.S., 1976, Ph.D., 1979 (University of Aberdeen)
- Donald Lewis Madison** (1969), *Professor of Social and Administrative Medicine and Family Medicine, School of Medicine and Professor of Health Policy and Administration,*
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- Kathryn Magruder-Habib** (1977), *Adjunct Assistant Professor of Epidemiology* – B.A., 1971 (Duke University); M.P.H., 1975, Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Penelope K. Manasco** (1990), *Adjunct Assistant Professor of Nutrition* – B.S., 1974 (Purdue University); M.S., 1976 (Virginia Polytechnic Institute and State University); M.D., 1984 (Tulane University School of Medicine)
- Barry H. Margolin** (1987), *Professor and Chair of Biostatistics* – B.S., 1963 (City College of New York); M.A., 1964, Ph.D., 1967 (Harvard University)
- Lewis Margolis** (1990), *Associate Professor of Maternal and Child Health* – A.B., 1970, M.D., 1974 (University of Chicago); M.P.H., 1980 (University of North Carolina at Chapel Hill)
- Peter A. Margolis** (1991), *Adjunct Assistant Professor of Epidemiology* – A.B., 1976 (Dartmouth College); M.D., 1980 (New York University)
- Sandra L. Martin** (1990), *Assistant Professor of Maternal and Child Health* – B.A., 1978, M.Sc., 1984 (McMaster University); Ph.D., 1988 (University of North Carolina at Chapel Hill)
- Ted B. Martonen** (1982), *Adjunct Professor of Environmental Sciences and Engineering* – B.S., 1966 (University of Michigan); M.S., 1971 (Michigan State University); M.S., 1973; Ph.D., 1977 (University of Rochester)
- Karen Mastroianni** (1989), *Clinical Instructor of Public Health Nursing* – B.S.R.N., 1979 (University of Akron); M.P.H., 1988 (University of North Carolina at Chapel Hill)
- David B. Matchar** (1989), *Adjunct Assistant Professor of Health Policy and Administration* – A.B., 1976 (Princeton University); M.D., 1980 (University of Maryland)
- Jane E. Matthis** (1988), *Adjunct Instructor of Health Behavior and Health Education* – B.S., 1967 (Brigham Young University); M.S.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Imogene McCanless** (1984), *Adjunct Assistant Professor of Biostatistics* – B.A., 1972, M.A., 1973 (The University of North Carolina at Greensboro); Ph.D., 1982 (The University of North Carolina at Chapel Hill)
- Margaret F. McCann** (1985), *Research Assistant Professor of Epidemiology* – A.B., 1970 (Middlebury College); M.S., 1973 (Hunter College); Ph.D., 1984 (The University of North Carolina at Chapel Hill)
- David McCoy** (1986), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1976, M.Ed., 1979 (University of Georgia); M.P.H., 1982, J.D., 1985 (The University of North Carolina at Chapel Hill)
- Neil J. McDonald** (1983), *Adjunct Associate Professor of Health Policy and Administration* – B.S., 1948 (Duke University); M.P.A., 1966 (Baylor University); Dr.P.A., 1971 (George Washington University)
- Timothy McGloin** (1987), *Adjunct Instructor of Health Behavior and Health Education* – B.S., 1967 (Loyola College); M.S.P.H., 1971 (University of Massachusetts)
- Marie Justin McIntyre** (1967), *Associate Professor of Public Health Nursing, Emerita* (1980) – B.S., 1950, M.S., 1952 (Syracuse University); M.S., 1962 (Harvard University)
- Curtis P. McLaughlin** (1968), *Professor of Business Administration and Health Policy and Administration and Coordinator of Operations Management and Quantitative Methods, School of Business Administration* – B.A., 1954 (Wesleyan College); M.B.A., 1956, D.B.A., 1966 (Harvard University)
- Robert A. McLean** (1986), *Associate Professor of Health Policy and Administration* – B.A., 1971; M.A., 1973 (University of Texas at Austin); Ph.D., 1976 (Cornell University)
- Kenneth R. McLeroy** (1983), *Adjunct Associate Professor of Health Behavior and Health Education* – B.S., 1967 (University of Houston); M.S., 1970 (University of Oklahoma); Ph.D., 1982 (The University of North Carolina at Chapel Hill)

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- Robert A. McNutt** (1987), *Adjunct Assistant Professor of Health Policy and Administration* – B.A., 1971, M.D., 1975 (Michigan State University)
- Julie McQueen** (1988), *Adjunct Instructor of Health Behavior and Health Education* – B.S., 1977 (The University of North Carolina at Greensboro)
- Melinda S. Meade** (1978), *Professor of Geography and Adjunct Professor of Epidemiology* – B.A., 1966 (Hofstra University); M.A., 1970 (Michigan State University); Ph.D., 1974 (University of Hawaii)
- Marie Meglen** (1987), *Adjunct Assistant Professor of Maternal and Child Health* – B.S., 1963 (College of Saint Scholastica); M.S.C., 1968 (Columbia University)
- Wilbur K. Milhous** (1989), *Adjunct Associate Professor of Parasitology* – B.S., 1970, M.S., 1972 (Clemson); Ph.D., 1983 (The University of North Carolina at Chapel Hill)
- Nancy Milio** (1976), *Professor of Nursing, School of Nursing and Professor of Health Policy and Administration, School of Public Health* – B.S., 1960, M.A., 1965 (Wayne State University); Ph.D., 1970 (Yale University)
- C. Arden Miller** (1966), *Professor of Maternal and Child Health, School of Public Health and Professor of Pediatrics, School of Medicine* – M.D., 1948 (Yale University)
- Cass T. Miller** (1985), *Assistant Professor of Environmental Sciences and Engineering* – B.S., 1977; M.S. (University of Toledo, OH); M.S., 1981; Ph.D., 1984 (University of Michigan)
- David S. Millington** (1981), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.Sc., 1966, Ph.D., 1969 (University of Liverpool, England)
- Karen Monaco** (1990), *Adjunct Instructor of Health Behavior and Health Education* – B.A., 1964 (Newton College); M.S., 1975 (City University of New York)
- Beatrice Bell Mongeau** (1962), *Associate Professor of Public Health Nursing, Emerita* (1978) – B.S., 1955, M.P.H., 1956 (The University of North Carolina); Ph.D., 1973 (The University of North Carolina at Chapel Hill)
- Jerrell Moore** (1990), *Adjunct Instructor of Health Behavior and Health Education* – B.S.P.H., 1985, M.P.H., 1988 (The University of North Carolina at Chapel Hill)
- Margaret E. Moore** (1990), *Adjunct Instructor of Health Policy and Administration* – B.A., 1968, M.A., 1971 (University of Michigan); M.P.H., 1989 (University of Illinois)
- Robert Burns Moorhead** (1967), *Lecturer in Health Policy and Administration and Associate Dean for Computing and Information Services* – B.A., 1954, (The University of North Carolina); M.P.A., 1972 (The University of North Carolina at Chapel Hill)
- David Humphreys Moreau** (1968), *Professor of City and Regional Planning and of Environmental Sciences and Engineering and Director of Water Resources, North Carolina State University* – B.S., 1960 (Mississippi State University); M.S., 1963 (The University of North Carolina at Chapel Hill); Ph.D., 1967 (Harvard University)
- Lucy Shields Morgan** (1942), *Professor of Health Education, Emerita* (1966) – A.B., 1922 (University of Tennessee); M.A., 1929 (Columbia University); M.S., 1932 (University of Tennessee); Ph.D., 1938 (Yale University)
- Timothy M. Morgan** (1987), *Adjunct Associate Professor of Biostatistics* – B.A., 1979, M.S., 1980, Ph.D., 1983 (University of California at Los Angeles)
- Dexter Morris** (1987), *Adjunct Assistant Professor of Epidemiology* – B.A., 1974 (University of Indiana); Ph.D., 1980 (University of Texas); M.D., 1984 (Baylor College of Medicine)
- Joseph Morrissey** (1987), *Adjunct Associate Professor of Health Policy and Administration and Associate Professor of Social Medicine* – B.S., 1963 (Holy Cross College); M.A., 1966 (Clark University); Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Sarah Taylor Morrow** (1968), *Adjunct Professor of Maternal and Child Health* – B.S., 1942 (The University of North Carolina); M.D., 1944 (University of Maryland); M.P.H., 1960 (The University of North Carolina)
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- Keith Eldon Muller** (1978), *Associate Professor in Biostatistics* – B.S., 1970, M.A., 1971 (Bradley University); Ph.D., 1976, M.S., 1981 (The University of North Carolina at Chapel Hill)
- Eric B. Munson** (1980), *Adjunct Professor of Social and Administrative Medicine and Adjunct Professor of Health Policy and Administration* – B.A., 1965 (Wabash College); M.B.A., 1967 (University of Chicago)
- Elizabeth Mutran** (1987), *Associate Professor of Health Behavior and Health Education* – B.A., 1971 (Saint Francis College); M.A., 1973, Ph.D., 1977 (Indiana University)
- Dennis F. Naugle** (1989), *Adjunct Assistant Professor of Environmental Sciences and Engineering* – B.S., 1967 (General Motors Institute); M.S., 1971, Ph.D., 1981 (University of North Carolina at Chapel Hill)
- Beth Newman** (1990), *Assistant Professor of Epidemiology* – B.A., 1975 (University of California at Santa Cruz); M.S., 1978 (University of California at Davis); Ph.D., 1987 (University of California at Berkeley)
- Daniel L. Norwood** (1986), *Adjunct Assistant Professor of Environmental Sciences and Engineering* – B.S., 1977 (Virginia Polytechnic Institute and State University); M.S.P.H., 1981; Ph.D., 1985 (The University of North Carolina at Chapel Hill)
- Richard R. Nugent** (1979), *Adjunct Associate Professor of Maternal and Child Health* – B.A., 1962 (Amherst College); M.D., 1966 (University of Pennsylvania); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Charles H. Okey** (1976), *Clinical Associate Professor of Parasitology and Laboratory Practice, Emeritus (1982)* – A.B., 1936 (Arkansas State University); M.S., 1943 (University of Tennessee); Ph.D., 1950 (Yale University)
- Daniel Alexander Okun** (1952), *Kenan Professor of Environmental Engineering, Emeritus (1982) in the Department of Environmental Sciences and Engineering* – B.S.C.E., 1937 (Cooper Union); M.S.C.E., 1938 (California Institute of Technology); Sc.D., 1948 (Harvard University)
- James A. Oppold** (1989), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.S., 1958 (Loras College, Iowa); M.S., 1960 (University of Kansas); Ph.D., 1969 (University of Florida, Gainesville)
- Hans W. Paerl** (1978), *Adjunct Professor of Environmental Chemistry and Biology, School of Public Health and Professor, Institute of Marine Sciences and Curriculum in Marine Sciences* – A.A., 1967 (College of San Mateo, California); B.Sc., 1969; Ph.D., 1973 (University of California)
- Barnett R. Parker** (1977), *Associate Professor of Health Policy and Administration* – B.S., 1966, M.S., 1972, Ph.D., 1976 (University of Rochester)
- George R. Parkerson, Jr.** (1977), *Adjunct Professor of Epidemiology* – B.S., 1953, M.D., 1953 (Duke University); M.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Rebecca Parkinson** (1983), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.A., 1971 (Drew University); M.S.P.H., 1973 (The University of North Carolina at Chapel Hill)
- Kathleen P. Paterson** (1990), *Visiting Lecturer of Public Health Nursing* – B.N. & B.Sc., 1980 (Memorial University of Newfoundland, St. John's); M.P.H., 1987 (The University of North Carolina at Chapel Hill)
- John E. Paul** (1984), *Adjunct Assistant Professor of Health Policy and Administration* – B.A., 1969 (Cornell University); M.Ed., 1975 (University of North Carolina at Charlotte); M.S.P.H., 1980, Ph.D., 1982 (The University of North Carolina at Chapel Hill)
- Clarence E. Pearson** (1987), *Adjunct Professor of Health Behavior and Health Education* – B.S., 1950 (Northern Illinois University); M.P.H., 1952 (The University of North Carolina at Chapel Hill)
- Mary D. Peoples-Sheps** (1981), *Associate Professor of Public Health Nursing and Maternal and Child Health* – B.S.N., 1969 (St. John's College); M.S., 1973 (Boston University); Dr.P.H., 1981 (The University of North Carolina at Chapel Hill)
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- Harry T. Phillips** (1969), *Professor of Health Policy and Administration, School of Public Health and Professor of Social and Administrative Medicine, School of Medicine, Emeritus (1983)* – M.B., 1938, Ch.B., 1938, D.P.H., 1953, M.D., 1956 (University of Cape Town, S. Africa)
- Margaret B. Pollard** (1975), *Clinical Assistant Professor in Health Behavior and Health Education* – B.S., 1954, M.S., 1958 (North Carolina Central)
- William Kenneth Poole** (1989), *Adjunct Professor of Biostatistics* – B.S., 1974 (Austin Peay State University); M.P.H., 1963, Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Barry M. Popkin** (1977), *Professor of Nutrition* – B.S., 1967, M.S., 1969 (University of Wisconsin); Ph.D., 1974 (Cornell University)
- Miquel S. Porta** (1985), *Adjunct Assistant Professor of Epidemiology* – B.S., 1974 (Institut EP Joanot Martorell (UAB)); M.D., 1981 (Universitat Autònoma de Barcelona); M.P.H., 1984 (The University of North Carolina at Chapel Hill)
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- James V. Porto, Jr.** (1988), *Clinical Assistant Professor of Health Policy and Administration* – B.A., 1968 (Duke University); M.S., 1976 (North Carolina State University at Raleigh)
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- Dana Edward Anthony Quade** (1962), *Professor of Biostatistics* – B.A., 1955 (UCLA); Ph.D., 1960 (The University of North Carolina at Chapel Hill)
- Madhav B. Ranade** (1981), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B. Tech., 1964 (Nagpur University, India); M.S., 1968, Ph.D., 1974 (Illinois Institute of Technology)
- Elizabeth W. Randall-David** (1990), *Adjunct Assistant Professor of Public Health Nursing* – B.S., 1965 (Duke University); B.S.N., 1975, Ph.D., 1985 (University of Florida, Gainesville)
- Susan Randolph** (1987), *Adjunct Instructor of Public Health Nursing* – B.S.N., 1975 (Ohio State University); M.S.N., 1979 (Indiana University)
- Stephen M. Rappaport** (1990), *Professor of Environmental Sciences and Engineering* – B.S., 1969 (Graceland College); M.S.P.H., 1973, Ph.D., 1974 (The University of North Carolina at Chapel Hill)
- Daniel B. Reimer** (1989), *Adjunct Instructor of Health Policy and Administration* – B.S., 1967 (University of Wisconsin); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Donald W. Reinfurt** (1978), *Adjunct Associate Professor in Biostatistics, Associate Director for Analysis Studies, Highway Safety Research Center* – B.S., 1960 (State University of New York at Albany); M.A., 1963 (State University of New York at Buffalo); Ph.D., 1970 (North Carolina State University at Raleigh)
- Parker Cramer Reist** (1972), *Professor of Air and Industrial Hygiene Engineering in the Department of Environmental Sciences and Engineering* – B.S., 1955 (Pennsylvania State
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- Barbara Renner** (1985), *Adjunct Assistant Professor of Health Behavior and Health Education* – B.S., 1977, M.Ed., 1979, Ph.D., 1981 (University of Virginia)
- Jimmie L. Rhyne** (1951), *Lecturer in Maternal and Child Health* – B.A., 1944 (The University of North Carolina); M.D., 1948 (University of Maryland, School of Medicine); M.P.H., 1958 (The University of North Carolina at Chapel Hill)
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- Thomas Rice** (1983), *Associate Professor of Health Policy and Administration* – B.A., 1976 (The University of North Carolina at Chapel Hill); M.A., 1979, Ph.D., 1982 (University of California, Berkeley)
- Wilson B. Riggan** (1969), *Adjunct Associate Professor of Biostatistics* – B.S., 1950 (Virginia Polytechnic Institute); Ph.D., 1966 (North Carolina State University at Raleigh)
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- Emily James Rivenbark** (1979), *Adjunct Instructor of Public Health Nursing and Nursing* – B.S.N., 1973 (East Carolina University)
- Walter J. Rogan** (1977), *Adjunct Associate Professor of Epidemiology* – B.A., 1971 (LaSalle College); M.P.H., 1975, M.D., 1975 (University of California)
- Bonnie Rogers** (1984), *Assistant Professor of Public Health Nursing and Clinical Assistant Professor, School of Nursing* – Diploma, 1966 (Washington Hospital Center); B.S., 1976 (George Mason University, Virginia); M.P.H., 1977; Dr.P.H., 1984 (The Johns Hopkins University)
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- Michael Rosenberg** (1985), *Adjunct Associate Professor of Epidemiology* – B.A., 1970 (University of California, Berkeley); M.P.H., 1978 (Harvard University); M.D., 1975 (University of California, Davis)
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- Marla E. Salmon** (1986), *Professor and Chair, Curriculum in Public Health Nursing* – B.A., 1971; B.S.N., 1972 (University of Portland, Oregon); Sc.D., 1977 (The Johns Hopkins University)
- Basil Samara** (1988), *Adjunct Assistant Professor of Biostatistics* – B.A., 1971 (Kalamazoo College); M.S., 1979 (Miami University); Ph.D., 1985 (University of Florida at Gainesville)
- Gregory P. Samsa** (1989), *Adjunct Assistant Professor of Epidemiology* – B.A., 1979, M.S., 1981, Ph.D., 1988 (The University of North Carolina at Chapel Hill)
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- Robert S. Sandler** (1981), *Clinical Associate Professor of Epidemiology, School of Public Health and Associate Professor of Medicine, School of Medicine* — B.S., 1971 (Union College); M.D., 1975 (Yale University); M.P.H., 1982, (The University of North Carolina at Chapel Hill)
- David A. Savitz** (1985), *Associate Professor of Epidemiology* — B.S., 1975 (Brandeis University, Waltham, MA); M.S., 1978 (Ohio State University); Ph.D., 1982 (University of Pittsburgh)
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- Morris Schaefer** (1967), *Professor of Health Policy and Administration Emeritus (1987) and Clinical Professor, Department of Psychiatry* — B.S., 1943 (New Jersey State University); M.A., 1951 (New School for Social Research); D.P.A., 1962 (Syracuse University)
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- Anna P. Schenck** (1989), *Adjunct Instructor of Health Behavior and Health Education* — B.A., 1977, M.S.P.H., 1983 (The University of North Carolina at Chapel Hill)
- Joellen M. Schildkraut** (1989), *Research Assistant Professor of Epidemiology* — B.S., 1976 (Penn State University); M.P.H., 1982, Ph.D., 1987 (Yale University)
- Ernest Schoenfeld** (1972), *Associate Dean for Administration and Lecturer of Health Policy and Administration* — A.A.S., 1956 (State University Agricultural and Technical Institute); B.S., 1964 (Cornell University); M.P.H., 1977, Dr.P.H., 1981 (The University of North Carolina at Chapel Hill)
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- John Richard Seed** (1981), *Professor of Epidemiology* — A.B., 1959 (Lafayette College); Ph.D., 1963 (Yale University)
- Francoise M. Seillier-Moiseiwitsch** (1989), *Assistant Professor of Biostatistics* — B.Sc., 1981 (University of London, Kings College); M.Sc., 1982, Ph.D., 1986 (University of London, University College)
- Pranab Kumar Sen** (1965), *Cary C. Boshamer Professor of Biostatistics and Adjunct Professor of Statistics* — B.S., 1955, M.S., 1957, Ph.D., 1962 (Calcutta University, India)
- Miriam Bachar Settle** (1980), *Clinical Assistant Professor of Health Behavior and Health Education* — B.A., 1954 (Hunter College); M.S., Hyg., 1963 (University of Pittsburgh)
- Richard H. Shachtman** (1968), *Professor of Biostatistics, Operations Research and Systems Analysis* — B.A., 1963 (North Carolina State University at Raleigh); M.A., 1967, Ph.D., 1968 (University of Maryland)
- Babubhai V. Shah** (1971), *Adjunct Professor of Biostatistics* — B.Sc., 1955, M.Sc., 1957, Ph.D., 1960 (University of Bombay)
- Sandra E. Shay** (1989), *Clinical Assistant Professor of Public Health Nursing and School of Nursing* — B.S.N., 1962 (Boston University); M.S., 1976 (East Carolina University); Ed.D., 1979 (North Carolina State University at Raleigh)
- Cecil George Sheps** (1968), *Taylor Grandy Distinguished Professor of Social Medicine, Department of Social and Administrative Medicine and Professor of Epidemiology, Emeritus* (1986) — M.D., 1936 (University of Manitoba); M.P.H., 1947 (Yale University); D.Sc., (Hon.), 1970 (University of Chicago Medical School); Ph.D., 1983 (Ben Gurion University)
- David S. Sheps** (1979), *Clinical Professor of Epidemiology and Professor of Medicine* — B.A., 1965, M.D., 1969, M.S.P.H., 1988 (The University of North Carolina at Chapel Hill)
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- Mark S. Shuman** (1970), *Professor of Environmental Chemistry in the Department of Environmental Sciences and Engineering* — B.S., 1959 (Washington State University); Ph.D., 1966 (University of Wisconsin)
- Carl M. Shy** (1974), *Professor of Epidemiology, Professor of Environmental Sciences and Engineering, Clinical Professor of Family Medicine and Director of Occupational Health Studies Program* — A.B., 1956 (St. Louis University); M.D., 1962 (Marquette University); M.P.H., 1965, Dr.P.H., 1967 (University of Michigan)
- Earl Siegel** (1964), *Professor of Maternal and Child Health Emeritus (1989)* — B.S., 1944 (University of Pittsburgh); M.D., 1948 (New York Medical College); M.P.H., 1961 (University of California, Berkeley)
- Ilene C. Siegler** (1991), *Adjunct Associate Professor of Epidemiology* — A.B., 1968 (University of Michigan); Ph.D., 1973 (Syracuse University); M.P.H., 1988 (The University of North Carolina at Chapel Hill)
- Kit Nordbo Simpson** (1985), *Assistant Professor of Health Policy and Administration* — N.A. (Pittman School of Business, London University); Diploma, 1968 (Hospitals-laborant-skolen, University of Copenhagen); M.P.H., 1983, Dr.P.H., 1988 (The University of North Carolina at Chapel Hill)
- Philip C. Singer** (1973), *Professor of Environmental Sciences and Engineering* — B.C.E., 1963 (The Cooper Union); M.S., 1965 (Northwestern University); S.M. 1965, Ph.D., 1969 (Harvard University)
- Thomas R. Skopek** (1990), *Associate Professor of Environmental Sciences and Engineering, School of Public Health and Associate Professor of Pathology, School of Medicine* — B.S., 1977, M.S., 1977, Ph.D., 1979 (Massachusetts Institute of Technology)
- Philip D. Sloane** (1979), *Clinical Associate Professor of Epidemiology and Associate Professor of Family Medicine* — B.A., 1972 (Pamona College, California); M.D., 1975 (Medical College of Ohio); M.P.H., 1988 (The University of North Carolina at Chapel Hill)
- William Thomas Small, Jr.** (1971), *Assistant Dean for Student Affairs* — B.S., 1965 (North Carolina Central University); M.S.P.H., 1969 (The University of North Carolina at Chapel Hill)
- C. Gregory Smith** (1983), *Adjunct Assistant Professor of Epidemiology* — A.B., 1972, M.D., 1977, M.P.H., 1982 (The University of North Carolina at Chapel Hill)
- Marjolein V. Smith** (1985), *Adjunct Assistant Professor of Biostatistics* — B.S., 1974 (North Carolina State University at Raleigh); M.S., 1975 (University of Kentucky); M.S., 1977; Ph.D. (North Carolina State University at Raleigh)
- Mark D. Sobsey** (1974), *Professor of Environmental Sciences and Engineering, School of Public Health, and Bacteriology and Immunology, School of Medicine* — B.S., 1965, M.S., 1967 (University of Pittsburgh); Ph.D., 1971 (University of California, Berkeley)
- William A. Sollecito** (1983), *Adjunct Assistant Professor of Health Policy and Administration* — B.B.A., 1969 (Baruch College); M.S., 1970 (University of Pittsburgh); Dr.P.H., 1982 (The University of North Carolina at Chapel Hill)
- James R. Sorenson** (1985), *Professor and Chair of the Department of Health Behavior and Health Education* — B.A., 1965, M.A., 1966 (University of Washington, Seattle); Ph.D., 1970 (Cornell University)
- Carol J. Spratt**, (1990), *Adjunct Assistant Professor of Health Policy and Administration* — B.A., 1972, D.D.S., 1977, M.P.H., 1984 (The University of North Carolina at Chapel Hill)
- Catherine Staes** (1989), *Adjunct Instructor in Public Health Nursing* — B.S.N., 1981 (Georgetown University); M.P.H., 1987 (Johns Hopkins University)

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- John W. Stamm** (1984), *Professor of Dental Ecology and Dean, School of Dentistry, and Adjunct Professor of Epidemiology* – D.D.S., 1967 (University of Alberta, Canada); D.D.P.H., 1969, M.Sc.D., 1971 (University of Toronto)
- Lola V. Stamm** (1982), *Assistant Professor of Epidemiology* – B.S., 1974 (Salem College, Salem, WV); M.S., 1977, Ph.D., 1979 (West Virginia University)
- Thomas B. Starr** (1983), *Adjunct Assistant Professor of Biostatistics* – B.A., 1966 (Hamilton College); M.S., 1968, Ph.D., 1971 (University of Wisconsin, Madison)
- Sally C. Stearns** (1989), *Assistant Professor of Health Policy and Administration* – B.A., 1977 (University of Michigan); M.Sc., 1979 (London School of Economics); Ph.D., 1987 (University of Wisconsin)
- Allan B. Steckler** (1975), *Professor of Health Behavior and Health Education* – B.S., 1964, M.P.H., 1965, Dr.P.H., 1971 (University of California, Los Angeles)
- Arthur C. Stern** (1968), *Professor of Air Hygiene in the Department of Environmental Sciences and Engineering, Emeritus (1978)* – M.E., 1930, M.S., 1933 (Stevens Institute of Technology); Dr. of Engineering, Honoris Causa, 1975 (Stevens Institute of Technology)
- Rachel Stevens** (1987), *Clinical Assistant Professor and Deputy Chair for Administration, Curriculum of Public Health Nursing* – B.S.N., 1957, M.S.N., 1960 (The University of North Carolina at Chapel Hill); Ed.D., 1983 (North Carolina State University at Raleigh)
- Paul W. Stewart** (1982), *Research Assistant Professor of Biostatistics* – B.S., 1975 (Furman University); M.S., 1977, Ph.D., 1981 (The University of North Carolina at Chapel Hill)
- E. Barbara Stocking** (1983), *Associate Professor of Maternal and Child Health and Public Health Nursing, Emerita (1981)* – Dip. in Nursing, 1937 (Capital City School of Nursing); B.S., 1952 (Wayne State University); M.P.H., 1957 (Harvard University)
- Woodhall Storfjord** (1982), *Adjunct Assistant Professor of Environmental Sciences and Engineering* – B.A., 1965 (Dartmouth College); B.M.S., 1967 (Dartmouth Medical School); M.D., 1968 (Harvard University); M.S.P.H., 1980 (The University of North Carolina at Chapel Hill)
- Victor J. Strecher** (1984), *Associate Professor of Health Behavior and Health Education* – B.S., 1977 (Michigan State University); M.P.H., 1980, Ph.D., 1983 (University of Michigan)
- David S. Strogatz** (1985), *Adjunct Associate Professor of Epidemiology* – B.A., 1975 (Amherst College); M.S.P.H., 1979; Ph.D., 1983 (The University of North Carolina at Chapel Hill)
- Chirayath M. Suchindran** (1972), *Professor of Biostatistics* – B.Sc., 1960, M.Sc., 1962 (Kerala); M.S.P.H., 1968, Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- James A. Swenberg** (1990), *Professor of Environmental Sciences and Engineering, School of Public Health and Professor of Pathology, School of Medicine* – B.S., 1964, D.V.M., 1966 (University of Minnesota); M.S., 1968, Ph.D., 1970 (Ohio State University)
- Michael R. Swift** (1972), *Professor of Medicine and Clinical Professor of Epidemiology* – B.A., 1955 (Swarthmore College); M.A., 1957 (University of California, Berkeley); D.M., 1962 (New York University)
- Boyd R. Switzer** (1972), *Associate Professor, Department of Nutrition, School of Public Health and Adjunct Associate Professor of Biochemistry & Nutrition, School of Medicine* – B.A., 1965 (Bridgewater); Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- Michael Joseph Symons** (1969), *Professor of Biostatistics* – B.A., 1965 (Bowling Green State University); M.P.H., 1967, Ph.D., 1969 (University of Michigan)
- Dorothy McComb Talbot** (1974), *Professor of Public Health Nursing, Emerita (1984)* – Dip. in Nursing, 1940 (Jefferson Hospital, Philadelphia); B.S.N., 1945 (Texas State College for Women); M.A., 1958 (Columbia University); M.P.H., 1964, Ph.D., 1970 (Tulane University)
- Patricia S. Tennis** (1990), *Adjunct Assistant Professor of Epidemiology* – B.S., 1973 (University of Wisconsin, Madison); Ph.D., 1979 (Case Western Reserve); M.P.H., 1986 (The University of North Carolina at Chapel Hill)
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- James C. Thomas** (1989), *Assistant Professor of Epidemiology* – B.S., 1977 (University of California at Davis); M.P.H., 1982, Ph.D., 1987 (University of California, Los Angeles)
- Kenneth E. Thorpe** (1990), *Associate Professor of Health Policy and Administration* – B.A., 1978 (University of Michigan); M.A., 1980 (Duke University); Ph.D., 1985 (Rand Graduate Institute)
- Nancy L. Tigar** (1978), *Adjunct Assistant Professor in Public Health Nursing* – Dip. in Nursing, 1955 (Methodist Hospital, Philadelphia); B.S.N., 1962 (University of Pennsylvania); M.P.H., 1971 (University of Michigan)
- Hugh H. Tilson** (1979), *Adjunct Professor in Health Policy and Administration, Adjunct Professor of Epidemiology, School of Public Health and Adjunct Professor in the School of Pharmacy and Adjunct Professor of Social and Administration Medicine and Clinical Professor of Family Medicine, School of Medicine* – M.D., 1964 (Washington University); M.P.H., 1969, Dr.P.H., 1972 (Harvard University)
- Lori A. Todd** (1990), *Assistant Professor of Environmental Sciences and Engineering* – B.S., 1975 (Antioch College); M.S., 1980 (Cornell University); Ph.D., 1990 (The University of North Carolina at Chapel Hill)
- James Toole** (1985), *Adjunct Professor of Epidemiology* – B.A., 1947 (Princeton University); M.D., 1949 (Cornell University Medical College); L.L.B., 1963 (LaSalle Extension University)
- Elizabeth M. Tornquist** (1974), *Lecturer of Public Health Nursing* – B.A., 1954 (Duke University); M.A., 1956 (University of Chicago)
- Kinh N. Truong** (1985), *Assistant Professor of Biostatistics* – B.S., 1978 (University of Washington, Seattle); M.A., 1980; Ph.D. (University of California, Berkeley)
- Amy Tsui** (1985), *Associate Professor of Maternal and Child Health* – B.A., 1970, M.A., 1972 (University of Hawaii); Ph.D., 1977 (University of Chicago)
- Craig David Turnbull** (1971), *Associate Professor of Biostatistics* – B.A., 1962 (Albright College); M.P.H., 1965, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- Alvis G. Turner, Jr.** (1969), *Professor of Environmental Sciences in the Department of Environmental Sciences and Engineering* – B.A., 1952, M.S.P.H., 1958 (The University of North Carolina); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Emily T. Tyler** (1988), *Adjunct Instructor of Health Behavior and Health Education* – B.A., 1963 (Mary Baldwin College); M.P.H., 1967 (The University of North Carolina at Chapel Hill)
- Eunice Nickerson Tyler** (1945), *Professor of Health Education, Emerita (1966)*, Ph.B., 1931 (Brown University); C.P.H., 1933, M.P.H., 1936, Ph.D., 1946 (Yale University)
- Donald A. Tyndall** (1980), *Adjunct Associate Professor of Environmental Sciences and Engineering* – B.A., 1973, D.D.S., 1980, M.S.P.H., 1984 (The University of North Carolina at Chapel Hill)
- Herman Alfred Tyroler** (1960), *Alumni Distinguished Professor of Epidemiology* – A.B., 1943 (Ohio University); M.D., 1947 (New York University)
- J. Richard Udry** (1965), *Professor of Maternal and Child Health, School of Public Health, Professor of Sociology, and Director of the Carolina Population Center* – B.S., 1950 (Northwestern University); M.A., 1956 (Long Beach State College); Ph.D., 1960 (University of Southern California)
- Christine A. Uhlinger** (1981), *Adjunct Assistant Professor of Epidemiology* – B.A., 1972 (Bucknell University); V.M.D., 1979 (University of Pennsylvania, School of Veterinary Medicine); M.P.H., 1990 (The University of North Carolina at Chapel Hill)
- Martin H. Ulshen** (1977), *Associate Professor of Nutrition, School of Public Health and Associate Professor of Pediatrics, School of Medicine* – B.A., 1965, M.D., 1969 (University of Rochester)
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- Jane K. Vella** (1984), *Adjunct Assistant Professor of Health Behavior and Health Education* — B.Ed., 1955, (Rogers College); M.A., 1966 (Fordham University); Ed.D., 1979 (University of Massachusetts at Amherst)
- James E. Veney** (1970), *Professor of Health Policy and Administration* — B.A., 1961 (Ohio University); M.S., 1963, Ph.D., 1966 (Purdue University)
- Marilyn F. Vine** (1988), *Research Assistant Professor of Epidemiology* — A.B., 1978 (Brown University); M.P.H., 1983 (Yale University); Ph.D., 1988 (The University of North Carolina at Chapel Hill)
- Thomas J. Vitaglione** (1984), *Adjunct Associate Professor of Maternal and Child Health* — B.A., 1963 (Hofstra University); M. Phil., 1969 (Columbia University)
- Edward Harris Wagner** (1971), *Clinical Professor of Epidemiology* — B.A., 1961 (Princeton University); M.D., 1965 (State University of New York); M.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Clara Walters** (1972), *Clinical Assistant Professor of Public Health Nursing Emerita (1988)* — B.S., 1961 (Goshen College); M.S., 1971 (The University of North Carolina at Chapel Hill)
- David B. Washburn** (1980), *Adjunct Assistant Professor of Environmental Sciences and Engineering* — A.A., 1964 (Gardner-Webb Junior College); B.S., 1967, Ph.D., 1975 (North Carolina State University at Raleigh)
- Hetty Anne Waskin** (1990), *Adjunct Assistant Professor of Epidemiology* — B.S., 1972 (University of Michigan); M.S.P.H., 1973 (University of North Carolina at Chapel Hill); M.D., 1978 (University of Michigan)
- Elizabeth L. Watkins** (1977), *Professor of Maternal and Child Health Emerita (1990)* — A.B., 1944 (Bryn Mawr College); M.S.S.A., 1950 (Case Western Reserve); M.Sc.H., 1958, D.Sc., in H., 1966 (Harvard University)
- Julia Day Watkins** (1964), *Associate Professor of Public Health Nursing and Nursing, Emerita (1981)* — A.B., 1939 (Bryn Mawr College); R.N., 1944 (University of Virginia); M.P.H., 1957 (The University of North Carolina)
- James E. Watson, Jr.**, (1974), *Professor of Radiological Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1960, M.S., 1962 (North Carolina State University at Raleigh); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Norman Fred Weatherly** (1963), *Professor of Parasitology and Laboratory Practice Emeritus (1989)* — B.S., 1953, M.S., 1960 (Oregon State University); Ph.D., 1962 (Kansas State University)
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- Kristen A. Weigle** (1987), *Assistant Professor of Epidemiology* — B.S., 1973, M.D., 1976 (University of Pittsburgh)
- Clarice R. Weinberg** (1990), *Adjunct Associate Professor of Biostatistics* — B.S., 1972 (Simmons College); M.A., 1974 (Brandeis University); Ph.D., 1980 (University of Washington, Seattle)
- Jane A. Weintraub** (1988), *Associate Professor of Dental Ecology, School of Dentistry and of Health Policy and Administration and Adjunct Associate Professor of Epidemiology, School of Public Health* — B.S., 1975 (University of Rochester); D.D.S., 1979 (State University of New York); M.P.H., 1980 (Harvard University)
- Charles Manuel Weiss** (1956), *Professor of Environmental Biology in the Department of Environmental Sciences and Engineering Emeritus (1989)* — B.S., 1939 (Rutgers-The State University); Ph.D., 1950 (Johns Hopkins University)
- William G. Weissert** (1983), *Professor of Health Policy and Administration* — B.S., 1967 (Portland State University); M.S., 1968 (Northwestern University); Ph.D., 1972 (Claremont Graduate School)
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- Henry Bradley Wells** (1958), *Professor of Biostatistics, Emeritus (1980)* – B.A., 1950 (Emory University); M.S.P.H., 1953, Ph.D., (The University of North Carolina)
- Dale Whittington** (1981), *Associate Professor of Environmental Sciences and Engineering, School of Public Health, and City and Regional Planning* – A.B., 1972 (Brown University); M.P.A., 1976 (LBJ School of Public Affairs); M.Sc., 1978 (London School of Economics and Political Science); Ph.D., 1980 (University of Texas at Austin)
- Russell W. Wiener** (1989), *Adjunct Assistant Professor of Environmental Sciences and Engineering* – B.S., 1974, M.S., 1978 (Emory University); Ph.D., 1987 (University of Cincinnati)
- Allen J. Wilcox** (1979), *Adjunct Professor of Epidemiology* – B.A., 1968, M.D., 1973 (University of Michigan); M.P.H., 1976, Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Donald G. Willhoit** (1964), *Associate Professor of Environmental Sciences and Engineering* – B.A., 1956 (William Jewell College); M.S., 1958 (University of Washington); Sc.D., 1964 (University of Pittsburgh)
- Mark E. Williams** (1985), *Clinical Associate Professor of Epidemiology* – A.B., 1972; M.D., 1976 (The University of North Carolina at Chapel Hill)
- O. Dale Williams** (1970), *Professor of Biostatistics and Director, Center for Health Promotion and Disease Prevention* – B.S., 1962 (Southeastern Louisiana University); M.P.H., 1965, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- Ted M. Williams** (1988), *Lecturer in Environmental Sciences and Engineering Emeritus (1990)* – B.S., 1962 (East Carolina University); M.S.P.H., 1967 (The University of North Carolina at Chapel Hill)
- Bobby M. Wilson** (1989), *Adjunct Instructor of Environmental Sciences and Engineering* – B.S., 1963 (Western Kentucky University); M. Envr. Sc., 1970 (University of Oklahoma)
- William E. Wilson, Jr.** (1973), *Adjunct Professor of Air and Industrial Hygiene in the Department of Environmental Sciences and Engineering* – B.S., 1953 (Hendrix College); Ph.D., 1957 (Purdue University)
- Steven B. Wing** (1985), *Research Assistant Professor of Epidemiology* – B.A., 1975 (Vassar College); M.A., 1980 (Duke University); Ph.D., 1983 (The University of North Carolina at Chapel Hill)
- Ann F. Wolfe** (1983), *Adjunct Associate Professor of Maternal and Child Health* – B.S., 1957 (Bucknell University); M.D., 1961 (Temple University); M.P.H., 1968 (University of California, Berkeley)
- Takashi Yanagawa** (1989), *Adjunct Associate Professor of Biostatistics* – B.Sc., 1963, M.Sc., 1966, Dr.Sc., 1970 (Kyushu University)
- Bonnie C. Yankaskas** (1983), *Adjunct Assistant Professor of Epidemiology, School of Public Health and Research Assistant Professor of Radiology, School of Medicine* – B.A., 1967 (Simmons College); M.P.H., 1973 (Yale University); Ph.D., 1982 (The University of North Carolina at Chapel Hill)
- Blanca C. Zapata** (1990) *Assistant Professor of Maternal and Child Health* – B.A., 1981 (University of Massachusetts, Boston); M.P.H., 1983 (Yale University); Dr.P.H., 1989 (University of California, Berkeley)
- Steven H. Zeisel** (1990), *Professor and Chair of Nutrition, School of Public Health and Professor of Pediatrics, School of Medicine* – B.S., 1971 (Massachusetts Institute of Technology); M.D., 1975 (Harvard University); Ph.D., 1980 (Massachusetts Institute of Technology)
- William N. Zelman** (1978), *Professor of Health Policy and Administration* – B.A., 1964 (San Francisco State College); M.A., 1966, Ph.D., 1969 (University of Washington); M.Acc., 1977, C.P.A., 1978 (University of Denver)
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The University of North Carolina

Sixteen Constituent Institutions

C. D. Spangler, Jr.

B.S., M.B.A., D.H.L., LL.D., *President*

Raymond H. Dawson

B.A., M.A., Ph.D., *Vice-President-Academic
Affairs*

Judith P. Pulley

B.A., M.A., Ph.D., *Interim Vice-President-Planning*

Nathan F. Simms, Jr.

B.S., M.S., Ph.D., *Vice-President-Student Services
and Special Programs*

L. Felix Joyner

A.B. — *Vice-President-Finance*

Jasper D. Memory

B.S., Ph.D., *Vice-President-Research and Public
Service*

Wyndham Robertson

A.B., *Vice-President-Communications*

Jay M. Robinson

B.S., M.A., Ed.D., *Vice-President-Public
Affairs*

David G. Martin, Jr.

B.A., LL.B., *Secretary of the University*

Richard H. Robinson, Jr.

A.B., LL.B., *Assistant to the President*

History of the University

The University of North Carolina is composed of all the public institutions of higher education in North Carolina that confer degrees at the baccalaureate level or higher. The University was authorized by the State Constitution in 1776, and it was chartered in 1789 by the General Assembly.

The University of North Carolina opened its doors to students at Chapel Hill in 1795. Thereafter, beginning in the latter part of the nineteenth century, the General Assembly of North Carolina has established and supported fifteen other public senior institutions in keeping with Article IX, Section 8, of the Constitution of North Carolina which provides that the "General Assembly shall maintain a public system of higher education, comprising The University of North Carolina and such other institutions of higher education as the General Assembly may deem wise."

By 1969 The University of North Carolina included six constituent institutions, governed by a single Board of Trustees. This multicampus University had its beginnings in legislation enacted in 1931 that defined The University of North Carolina to include The University of North Carolina at Chapel Hill, North Carolina State University at Raleigh, The University of North Carolina at Asheville, and The University of North Carolina at Wilmington.

Beginning in 1877, the General Assembly of North Carolina established or acquired ten additional separately governed state-supported senior institutions of higher education. They are: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. Then, in 1971, the General Assembly redefined The University of North Carolina, and under the terms of that legislation all sixteen public senior institutions became constituent institutions of The University of North Carolina.

The constitutionally authorized Board of Trustees of the six-campus University of North Carolina was designated the Board of Governors and this body is by law The University of North Carolina. The Board of Governors consists of thirty-two members elected by the General Assembly, and it is charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." The chief executive officer of the University is the President.

Each constituent institution of the University has its own faculty and student body. The chief administrative officer of each institution is the chancellor, and the chancellors are responsible to the President.

Each constituent institution also has a board of trustees composed of thirteen members: eight elected by the Board of Governors, four appointed by the Governor, and the elected president of the student body *ex officio*. (The School of the Arts has two additional *ex officio* trustees.) The principal powers of these institutional boards are exercised under a delegation of authority from the Board of Governors.



Appendix A

RESIDENCE STATUS FOR TUITION PURPOSES¹

The following sections summarize important aspects of the residency law. A complete explanation of the Statute and the procedures under the Statute is contained in *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*. This *Manual* and other information concerning the application of this law are available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library and in the Reserve Reading Room of the Health Sciences Library. All students are responsible for knowledge of the contents of the Statute and the *Manual*.

Every applicant for admission is required to make a statement as to his or her length of residence in North Carolina. A person who qualifies as a resident for tuition purposes under North Carolina law pays a lower rate of tuition than a nonresident. To qualify for in-state tuition, a legal resident must have been domiciled in North Carolina for at least twelve months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the State during such twelve-month period was for purposes of maintaining a bona fide domicile rather than for purposes of maintaining a mere temporary residence incident to enrollment in an institution of higher education. "Domicile" means one's permanent home of indefinite duration, as distinguished from a temporary place of abode; it is synonymous with "legal residence" and is established by being physically present in a place with the concurrent intent to make that place a domicile. To determine an individual's intent, the University evaluates his or her objectively verifiable conduct as an indicator of his or her state of mind.

Procedural Information

General. A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual matriculation. In the absence of a current and final determination of the student's residence prior to matriculation, the student is classified a nonresident for tuition purposes. The institution will thereafter reach a final determination of the student's residence status. Unless a person supplies enough information to allow the admissions officer to classify him or her as a resident for tuition purposes, the person will be classified a nonresident for tuition purposes. A residence classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is required to be treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence classification for tuition purposes. The residence classification of a student by one institution is not binding on another institution. The North Carolina institutions of higher education will assist each other by supplying residency information and classification records concerning a student to another classifying institution upon request.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless (1) the affected student requests a reclassification inquiry or (2) the transfer or enrollment occurs following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

Responsibility of Students and Prospective Students. Any student or prospective student in doubt concerning his or her residence status bears the responsibility for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Office of Admissions of these circumstances in writing. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

¹The information in this section comes from three sources: (i) North Carolina General Statutes, §116-143.1, (ii) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*, Revised September 1985, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes.

Application Process. A person may obtain an application for resident status from his or her admissions office. Applicants for admission who claim eligibility for the in-state tuition rate customarily complete a two-page residency application as a part of the admissions application packet. Some applicants for admission will thereafter be required to complete a further, four-page, residency application. Enrolled students seeking a change from nonresident to resident status are required to complete a four-page residency application. *All* applications for resident status must be filed with the proper admissions office before the end of the term for which resident status for tuition purposes is sought. The last day of the final examination period is considered the last day of the term.

After filing a resident status application, a person may receive a letter from his or her admissions office requesting more information in connection with that application. When a student receives such a request before the end of the term for which classification is sought, he or she must respond to that request no later than three weeks after the end of the term. If the student receives the request for supplemental information after the end of the term in question, he or she must supply the requested information within three weeks after receipt of the request. Failure to supply the requested information within the specified time limit will result in a continuation of the student's nonresident classification unless good cause is shown for such failure.

The admissions office may require an applicant for admission to file a residency application, or respond to a request for more information, more quickly when residence status is a factor in the admissions decision.

The pamphlet "Information About Resident Status for Tuition Purposes" contains more details about the residency application process and is available at all admissions offices.

Fraudulent Applications. If a student is classified a resident for tuition purposes after submitting falsified residency information or after knowingly withholding residency information, the student's application for in-state tuition status is fraudulent. The institution may re-examine any application suspected of being fraudulent and, if warranted, will change the student's residence status retroactively to the beginning of the term with respect to which the student originally made the fraudulent application. If this occurs the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary consequences, including dismissal from the institution.

Burden of Proof and Statutory Prima Facie Evidence. A person has the burden of establishing facts which justify his or her classification as a resident for tuition purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the Statute, proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence.

a. Even if the person is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the person is not a legal resident of North Carolina unless he or she has lived in this state the five consecutive years prior to enrolling or re-registering. To overcome this prima facie showing of nonresidence, a person must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.

b. Conversely, if the person's parents are domiciliaries of North Carolina under the Statute, this fact constitutes prima facie evidence that the person is a domiciliary of North Carolina. This prima facie showing may also be overcome by other evidence to the contrary. If a person has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

Erroneous Notices Concerning Classification. If a student, who has been found to be a nonresident for tuition purposes, receives an erroneous written notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

Grace Period. If a student has been properly classified as a North Carolina resident for tuition purposes and, thereafter, his or her state of legal residence changes while he or she is enrolled in a North Carolina public institution of higher education, the statute provides for a grace period during which the student is allowed to pay tuition at the in-state rate despite the fact that the student is no longer a North Carolina legal resident. This grace period extends for a minimum of twelve months from the date of change in legal residence, and if the twelve-month period ends during a semester or academic term in which the student is enrolled, the grace period extends also to the end of that semester or academic term.

Reacquisition of Resident Tuition Status. The prescribed twelve-month period of legal residence may be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and reestablished

North Carolina domicile within twelve months after abandoning it. Interested persons should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

Appeals. A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that Committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded the opportunity to appear and be heard by the Committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact (within ten days of receipt of the Committee's decision) to the Chairman of the Residence Status Committee, and the Chairman promptly processes the appeal for transmittal to the State Residence Committee.

It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

Application of the Law to Specific Situations

Aliens. Aliens who are permanent residents of the U.S., or who hold a visa which will permit eventual permanent residence in the U.S., are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the U.S. under a visa conditioned at least in part upon intent not to abandon a foreign domicile (B, F, H, and J visas) cannot be classified a resident. An alien abiding in the U.S. under a visa issued for a purpose which is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal residence (C, D, and M visas) cannot be classified a resident.

Possession of certain other immigration documents may also allow an alien to be considered for in-state tuition status. For more details aliens should consult their admissions offices and the *Manual*. Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident status for tuition purposes.

Married Persons. The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed, solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of his or her spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

If a person otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina before the beginning of the term for which resident status is sought, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than twelve months, by reference to the length of the legal residence of the person's spouse, if the spouse has been a legal resident of the State for the requisite twelve-month period.

Military Personnel. The domicile of a person employed by the Federal government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the State of North Carolina.

Minors. A minor is any person who has not reached the age of eighteen years. Under the common law, a minor child whose parents are not divorced or legally separated is presumed to have the domicile of his or her father. This presumption may be rebutted if a preponderance of the evidence indicates that the mother and father have separate domiciles and that, under the circumstances, the child can fairly be said to derive his or her domicile from the mother. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father. If the minor lives for part of the year with each parent, in the absence of a custody award, the minor's domicile is presumed to remain that of the father. These common law presumptions control even if the minor has lived in North Carolina for five years as set forth above in **Burden of Proof and Statutory Prima Facie Evidence**, subsection a.

In determining residence status for tuition purposes, there are three exceptions to the above provisions:

1. If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.

If, immediately prior to his or her eighteenth birthday, a person would have been deemed to be a North Carolina legal resident under this provision but he or she achieves majority before enrolling in a North Carolina institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:

a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and

b. The person must begin enrollment at a North Carolina institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.

2. If, immediately prior to beginning an enrolled term, the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative, during those years, has functioned as a de facto guardian of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her eighteenth birthday, then, upon becoming eighteen, he or she will be deemed to be a legal resident of North Carolina of at least twelve months' duration.

3. Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. §7A-717, *et seq.*, he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile has, in fact, been established.

Prisoners. There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the *Manual*.

Property and Taxes. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time and that applications for classification should not be delayed until registration, when the number of applications makes accelerated handling impossible.

MILITARY TUITION BENEFIT¹

Certain members of the Armed Services, and their dependent relatives, who are not residents for tuition purposes may become eligible to be charged less than the out-of-state tuition rate under N.C. Gen. Stat. §116-143.3, the military tuition benefit provision. Any person seeking the military tuition benefit must qualify for admission to UNC-CH and must file an application for the benefit with his or her admissions office before the first day of classes of the term for which he or she initially seeks the benefit. To remain eligible to receive the military tuition benefit, he or she must file another application for the benefit before the first day of classes of the first term in which he or she is enrolled in each academic year. The burden of proving eligibility for the military tuition benefit lies with the applicant for the benefit, and the application and all required supporting affidavits must be complete and in proper order before the first day of classes of the term in question. Because of the time involved in securing the necessary affidavits from the appropriate military authorities, prospective applicants for the military tuition benefit are urged to secure application forms from their admissions offices and begin the application process several weeks before the first day of classes of the term for which they seek the benefit.

¹The information in this section comes from three sources: (i) North Carolina General Statutes, §116-143.3, (ii) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*, Revised September 1985, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes and Determination of Eligibility for the Special Military Tuition Benefit.

Eligibility of Members of the Armed Services. Eligible members of the Armed Services pay a rate of tuition computed by applying a statutory formula which is dependent, in part, on the amount of money payable by their Service employer to them or to the institution by reason of their enrollment. Application of the statutory formula yields the following results: if the service member's education is being fully funded by the Service employer, the amount of tuition owed is equal to out-of-state tuition; if the member's education is not being funded by his or her Service employer, he or she pays an amount equal to in-state tuition; and if the Service employer is providing partial educational funding, the amount of tuition owed depends on the amount of funding contributed by the Service employer.

To be eligible for this military tuition benefit, the individual must

- a. be a member of the United States Air Force, Army, Coast Guard, Marine Corps, Navy, North Carolina National Guard, or a reserve component of one of these services; and
- b. be abiding in North Carolina incident to active military duty which is performed at or from a duty station in North Carolina.

Eligibility of Dependent Relatives of Service Members. If the service member meets the conditions set forth above, his or her dependent relatives may be eligible to pay the in-state tuition rate if they share the service member's North Carolina abode; if they have complied with the requirements of the Selective Service System, if applicable; and if they qualify as *military dependents* of the service member.

If the service member voluntarily ceases to live in North Carolina or is involuntarily absent from the state on military orders (other than absences on routine maneuvers and temporary assignments), he or she is deemed to have moved his or her abode from North Carolina. If a dependent relative of a service member has become eligible for the military tuition benefit and, after the beginning of the term of eligibility, the service member moves his or her abode from North Carolina, the dependent relative will continue to be eligible for the military tuition benefit only for the remainder of that academic year. An academic year runs from the first day of classes of the fall semester through the last day of exams of the following summer session, second term.

For a detailed explanation of the military tuition benefit provision (including an explanation of the formula used to compute the tuition rate for service members), a complete list of categories of persons who are considered "dependent relatives" for purposes of establishing eligibility for the military tuition benefit, and information about the registration requirements of the Selective Service System, applicants should consult *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes* (as amended September 1985). This *Manual* is available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library, and in the Reserve Reading Room of the Health Sciences Library.

Appeals of Eligibility Determinations of Admissions Officers. A student appeal of an eligibility determination made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the eligibility determination. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that Committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded an opportunity to appear and be heard by the Committee.

Any student desiring to appeal a determination of the Residence Status Committee must give notice in writing of that fact to the Chairman of the Residence Status Committee within ten days of receipt of the Committee's decision. The Chairman will promptly process the appeal for transmittal to the State Residence Committee.

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT

As a general rule, under the federal Family Educational Rights and Privacy Act (FERPA), personally identifiable information may not be released from a student's education records without his or her prior written consent. Exceptions to this rule are set out in the FERPA regulations and the FERPA policy of The University of North Carolina at Chapel Hill.

UNC-CH will disclose personally identifiable information from the education records of a student, without the student's prior written consent, to officials of another school or school system in which the student seeks or intends to enroll. UNC-CH will also disclose personally identifiable information from an enrolled student's education records, without the student's prior written consent, to officials of another school or school system in which the student is contemporaneously enrolled. Time, building, and room

number information from a student's class schedule will be disclosed to the University Police to assist them in serving the student with a warrant or subpoena.

UNC-CH makes public certain information that has been designated as "directory information": the student's name, address, telephone listing, date and place of birth, major field of study, class, enrollment status (full-time, half-time, or part-time), participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student. Examples of ways in which some of this information is made public include: names of students who receive honors and awards, who make the Dean's List, who hold offices, or who are members of athletic teams. The annual commencement program publishes the names of degree recipients. The University also publishes the *Campus Directory* annually, and some professional and graduate student groups publish directories of students in their departments or schools.

Students who do not wish to have any or all "directory information" made public without their prior consent, must send the Office of the University Registrar (CB# 2100, 105 Hanes Hall, The University of North Carolina at Chapel Hill) a signed and dated notice specifying items that are not to be published. To ensure that a listing for the student will not appear in the *Campus Directory*, this notice must be received by the Office of the University Registrar by the end of the registration period for the semester or session of first enrollment or, after an absence, of reenrollment. Such a notice will be honored until the student graduates, ceases to attend, or withdraws from the University unless the student notifies the Office of the University Registrar to the contrary in writing.

Students also have the right to inspect their "education records" as defined in the FERPA regulations. They may not inspect financial records and statements of their parents; confidential letters of recommendation placed in their education records before January 1, 1975 (with some exceptions); or confidential letters of recommendation placed in their education records after January 1, 1975, if they have waived their rights to inspect and review such letters.

A student who believes that information in his or her education records is inaccurate or misleading or violates his or her privacy or other rights may request that the institution amend the records, and, if the request is denied, he or she has the right to a hearing. If, after the hearing, the institution decides that the information is not inaccurate, misleading, or violative of privacy or other rights, the student has a right to place a statement in those records commenting on the information in question or giving the student's reasons for disagreeing with the institutional decision. The student may also place such a statement in his or her records in lieu of requesting a hearing if the student and the institution agree that an explanatory statement alone is the appropriate remedy. Complaints alleging violations of FERPA rights may also be filed with the U.S. Department of Education.

Questions about FERPA should be addressed to the Legal Adviser to the Special Assistant to the Chancellor (CB# 9150, 01 South Building). The text of FERPA and its regulations and the University's FERPA policy are also available for inspection in 01 South Building.

FIREARMS AND OTHER WEAPONS

The possession of any gun, rifle, pistol, dynamite cartridge, bomb, grenade, mine, explosive, bowie knife, dirk, dagger, slingshot, leaded cane, switchblade knife, blackjack, metallic knuckles, or any other weapons of like kind upon any University campus or in any University owned or operated facility is unlawful and contrary to University policy. Violation of this prohibition is a misdemeanor punishable by a fine not to exceed \$500 and/or six months' imprisonment, and may constitute a violation of the Campus Code.

IMMUNIZATION REQUIREMENT

Effective July 1, 1986, North Carolina State law requires that no person shall attend a college or university in North Carolina unless a certificate of immunization indicating that the person has received the immunizations required by the law is presented to the college or university on or before the first day of matriculation. Students enrolled at UNC-CH on July 1, 1986 are exempt from this requirement.

If the UNC-CH Medical History Form containing the certificate of immunization is not in the possession of the UNC-CH Student Health Service ten (10) days prior to the registration date, the University shall present a notice of deficiency to the person. The person shall have 30 calendar days from the first day of attendance to obtain the required immunizations. Those persons who have not complied with the immunization requirements by the end of 30 calendar days will be *administratively withdrawn* from the University.

The University of North Carolina at Chapel Hill

POLICY ON ILLEGAL DRUGS

I. INTRODUCTION

The Board of Trustees of The University of North Carolina at Chapel Hill, in conformity with the direction of the Board of Governors of The University of North Carolina, hereby adopts this Policy on Illegal Drugs, effective August 24, 1988. It is applicable to all students, faculty members, administrators, and other employees.

II. EDUCATION, COUNSELING, AND REHABILITATION

- A. The University of North Carolina at Chapel Hill has established and maintains a program of education designed to help all members of the university community avoid involvement with illegal drugs. This educational program emphasizes these subjects:
 - 1. The incompatibility of the use or sale of illegal drugs with the goals of the university;
 - 2. The legal consequences of involvement with illegal drugs;
 - 3. The medical implications of the use of illegal drugs; and
 - 4. The ways in which illegal drugs jeopardize an individual's present accomplishments and future opportunities.
- B. The University of North Carolina at Chapel Hill provides information about drug counseling and rehabilitation services available to members of the university community through campus-based programs and through community-based organizations. Persons who voluntarily avail themselves of university services are hereby assured that applicable professional standards of confidentiality will be observed.

III. ENFORCEMENT AND PENALTIES

- A. The University of North Carolina at Chapel Hill shall take all actions necessary, consistent with State and Federal law and applicable university policy, to eliminate illegal drugs from the university community. The University's Policy on Illegal Drugs is publicized in catalogs and other materials prepared for all enrolled and prospective students and in materials distributed to faculty members, administrators, and other employees.
- B. Students, faculty members, administrators, and other employees are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as "controlled substances" in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the university community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the university. It is not "double jeopardy" for both the civil authorities and the university to proceed against and punish a person for the same specified conduct. *The university will initiate its own disciplinary proceeding against a student, faculty member, administrator, or other employee when the alleged conduct is deemed to affect the interests of the university.*
- C. Penalties will be imposed by the university in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators, and other employees, as required by Section 3 of the Trustee Policies and Regulations Governing Academic Tenure in The University of North Carolina at Chapel Hill, by Section III.D of the Employment Policies for EPA Nonfaculty Employees of The University of North Carolina at Chapel Hill, by regulations of the State Personnel Commission, and the Disciplinary Procedure of the Staff Personnel Administration Guides (SPAG 37), by the Instrument of Student Judicial Governance, and by all other applicable provisions of the policies and procedures of The University of North Carolina at Chapel Hill.
- D. The penalties to be imposed by the university may range from written warnings with probationary status to expulsions from enrollment and discharges from employment. However, the following minimum penalties shall be imposed for the particular offenses described.
 - 1. *Trafficking in Illegal Drugs*
 - a. For the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedule I, N.C. General Statutes 90-89,

or Schedule II, N.C. General Statutes 90-90 (including, but not limited to, heroin, mescaline, lysergic acid diethylamide, opium, cocaine, amphetamine, methaqualine), any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.

- b. For a first offense involving the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedules III through VI, N.C. General Statutes 90-91 through 90-94, (including, but not limited to, marijuana, anabolic steroids, pentobarbital, codeine), the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent! For a second offense, any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.

2. *Illegal Possession of Drugs*

- a. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent.²
- b. For a first offense involving the illegal possession of any controlled substance identified in Schedules III through VI, N.C. General Statutes 90-91 through 90-94, the minimum penalty shall be probation, for a period to be determined on a case-by-case basis. A person on probation must agree to participate in a drug education and counseling program, consent to regular drug testing, and accept such other conditions and restrictions, including a program of community service, as the Chancellor or the Chancellor's designee deems appropriate. Refusal or failure to abide by the terms of probation shall result in suspension from enrollment or from employment for any unexpired balance of the prescribed period of probation.³
- c. For a second or other subsequent offenses involving the illegal possession of controlled substances, progressively more severe penalties shall be imposed, including expulsion of students and discharge of faculty members, administrators, or other employees.

E. Suspension Pending Final Disposition

When a student, faculty member, administrator, or other employee has been charged by the university with a violation of policies concerning illegal drugs, he or she may be suspended from enrollment or employment before initiation or completion of regular disciplinary proceedings if, assuming the truth of the charges, the Chancellor, or in the Chancellor's absence, the Chancellor's designee concludes that the person's continued presence within the university community would constitute a clear and immediate danger to the health or welfare of other members of the university community; provided, that if such a suspension is imposed, an appropriate hearing of the charges against the suspended person shall be held as promptly as possible thereafter.

IV. IMPLEMENTATION AND REPORTING

Annually, the Chancellor shall submit to the Board of Trustees a report on campus activities related to illegal drugs for the preceding year. The reports shall include, as a minimum, the following:

- (1) a listing of the major education activities conducted during the year;
- (2) a report on any illegal drug-related incidents, including any sanctions imposed;
- (3) an assessment by the Chancellor of the effectiveness of the campus program and;
- (4) any proposed changes in the Policy on Illegal Drugs.

A copy of the report shall be provided to the President, who shall confer with the Chancellor about the effectiveness of campus programs.

¹Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.

²Employees subject to the State Personnel Act are governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.

³If this balance for an employee subject to the State Personnel Act exceeds three days, that employee shall be discharged.



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