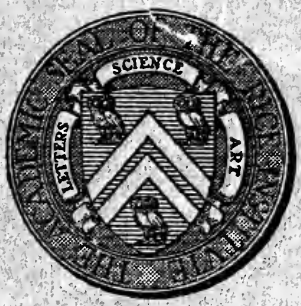
THE
RICE INSTITUTE
HOUSTON TEXAS



PRELIMINARY ANNOUNCEMENTS FOR THE ACADEMIC YEAR BEGINNING SEPTEMBER NINETEENTH NINETEEN HUNDRED AND SEVENTEEN

THE RICE INSTITUTE

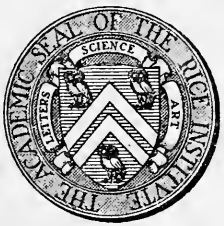
A UNIVERSITY OF

LIBERAL AND TECHNICAL
LEARNING

FOUNDED IN THE CITY OF HOUSTON TEXAS
BY WILLIAM MARSH RICE
AND DEDICATED BY HIM TO THE
ADVANCEMENT OF LETTERS
SCIENCE AND ART

OPENED FOR THE RECEPTION OF
STUDENTS IN THE AUTUMN OF
NINETEEN HUNDRED
AND TWELVE

EDGAR ODELL LOVETT : PRESIDENT

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CALENDAR

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1917

September 19-22	Entrance Examinations
September 21-22	Registration
September 24	Lectures begin
November 29	Thanksgiving Day
December 21	Autumn term ends

1918

January 3	Winter term begins
February 22	Washington's Birthday
March 2	Texas Independence Day
March 15	Winter term ends
March 18	Spring term begins
April 21	San Jacinto Day
May 20-25	Entrance Examinations
June 7	Spring term ends
June 8-10	Third Annual Commencement

THE RICE INSTITUTE

THE RICE INSTITUTE

THE NAME

THE new institution bears the name of the founder, the late William Marsh Rice. It aspires to university standing of the highest grade. Dedicated to the advancement of literature, science, and art, the educational programme of liberal and technical learning now being developed may justify the designation "Institute" as representing the functions of a teaching university and, at least in some of its departments, those of the more recent research institutions established in this country and abroad.

BRIEF HISTORICAL SKETCH

It is now rather more than twenty-five years since several public-spirited citizens of the community asked Mr. Rice to bear the expense of building a new public high school for the city of Houston. This direct gift to the city's welfare Mr. Rice was unwilling to make, but a few months later, taking into his confidence a half-dozen friends, he made known to them his desire to found a much larger educational enterprise for the permanent

benefit of the city and State of his adoption. These gentlemen were organized into a Board of Trustees for the new foundation, which was incorporated in 1891 under a broad charter granting the trustees large freedom in the future organization of a non-political and non-sectarian institution to be dedicated to the advancement of letters, science, and art. As a nucleus for an endowment fund, Mr. Rice at this time made over an interest-bearing note of two hundred thousand dollars to the original Board of Trustees, consisting of himself, the late Messrs. J. E. McAshan, E. Raphael, F. A. Rice, and A. S. Richardson, and Messrs. James Addison Baker and Cesar Maurice Lombardi. Under the terms of the charter, the board is a self-perpetuating body of seven members elected for life: vacancies since its organization have been filled by the election of Messrs. William Marsh Rice, Jr., Benjamin Botts Rice, Edgar Odell Lovett, and John Thaddeus Scott.

It was the unalterable will of the founder that the development of the work which he had conceived should progress no further during his lifetime. However, in the remaining days of his life he increased the endowment fund from time to time by transferring to the trustees the titles to certain of his properties, and in the end made the new foundation his residuary legatee. Upon the termination of the long years of litigation which followed Mr. Rice's death in 1900, the Board of Trustees found the Institute in possession of an estate whose present value is conservatively estimated at approximately ten million dollars, divided by the provisions of the founder's will into almost equal parts, available for equipment and en-

dowment respectively. It may be remarked in passing that it is the determined policy of the trustees to build and maintain the institution out of the income, thus preserving intact the principal not only of the endowment fund but also that of the equipment fund. While proceeding to convert the non-productive properties of the estate into income-bearing investments, the trustees called Mr. Edgar Odell Lovett, a professor in Princeton University, to assist them in developing the founder's far-reaching plans. Before taking up his residence in Houston, the future president visited the leading educational and scientific establishments of the world, returning in the summer of 1909 from a year's journey of study that extended from England to Japan. About this time negotiations were completed by which the Institute secured a campus of three hundred acres situated on the extension of Houston's main thoroughfare, three miles from the center of the city—a tract of ground universally regarded as the most appropriate within the vicinity of the city.

Another early decision of the trustees of the Institute was the determination that the new university should be housed in noble architecture worthy of the founder's high aims; and upon this idea they entered with no lower ambition than to establish on the campus of the Institute a group of buildings conspicuous alike for their beauty and for their utility, which should stand not only as a worthy monument to the founder's philanthropy, but also as a distinct contribution to the architecture of our country. With this end in view they determined to commit to Messrs. Cram, Goodhue, and Ferguson, of Boston and New York, the task of designing a general architectural

plan to embody in the course of future years the realization of the educational programme which had been adopted for the Institute. Such a general plan, the work of Mr. Ralph Adams Cram, L.H.D., exhibiting in itself many attractive elements of the architecture of Italy, France, and Spain, was accepted by the board in the spring of 1910. Immediately thereafter plans and specifications for an administration building were prepared, and in the following July the contract for its construction was awarded; three months later the erection of a mechanical laboratory and power-house was begun, and by the next autumn the construction of two wings of the first residential hall for men was well under way. In the preparation of preliminary plans for its initial building operations the Institute enjoyed the coöperation of an advisory committee consisting of Professor Ames, director of the physical laboratory of Johns Hopkins University; Professor Conklin, director of the biological laboratory of Princeton University; Professor Richards, chairman of the department of chemistry, Harvard University; and Professor Stratton, director of the National Bureau of Standards. In 1911, on the seventy-fifth anniversary of Texas Independence, the corner-stone of the administration building was laid by the trustees. This building, the mechanical laboratory of the engineering quadrangle, the power-house, and the first two wings of the first residential hall for men were ready for occupancy at the beginning of the first academic year in the fall of 1912. The third wing of this residential hall, begun in 1913, was occupied by students in the autumn of 1914; while the construction of the physics laboratories and lecture amphi-

theater, begun also in 1913, was completed in the summer of 1914 from plans prepared by Messrs. Cram and Ferguson under the direction of Mr. H. A. Wilson, D.Sc., F.R.S., resident professor of physics in the Institute. In January, 1916, ground was broken for the first wing of the second residential group for men; the construction of this wing was completed by September, 1916. The building schedule for the near future includes also special laboratories for instruction and investigation in chemistry and biology, and in the applications of these sciences to the arts of industry and commerce.

The actual work of instruction of the first academic year began on the 23d day of September, 1912, the anniversary of the death of the founder. In the presence of the trustees of the Institute, members of the teaching staff, and representative citizens of the community, the first class of students was received in the faculty chamber of the administration building with appropriate ceremonies on September 26th. The scholastic work of the first academic year was limited to a single class of freshmen of a standard of preparation as high as the best public and private high schools were capable of producing.

In the early autumn of 1912 an academic festival in observance of the formal opening of the Institute was held under most favorable conditions of weather, most generous coöperation of the community and commonwealth, and the heartening encouragement of several hundred scholars and scientists who came to Houston to assist in the launching of the new university. Chief among these distinguished representatives of life and learning were the twelve foreign savants who had con-

sented to participate in the inaugural programme by preparing series of lectures in the liberal humanities of philosophy, history, letters, and art, and in the fundamental sciences of mathematics, physics, chemistry, and biology. A complete account of the proceedings occupying the four days devoted to this celebration has been embodied in publications issued in commemoration of that occasion. In the latter appear in full the inaugural lectures of Professor Rafael Altamira y Crevea, of Madrid, Spain; Professor Emile Borel, of Paris, France; Senator Benedetto Croce, of Naples, Italy; Professor Hugo de Vries, of Amsterdam, Holland; Professor Sir Henry Jones, of Glasgow, Scotland; Privy Councilor Baron Dairoku Kikuchi, of Tokyo, Japan; Professor John William Mackail, of London, England; Privy Councilor Professor Wilhelm Ostwald, of Gross-Bothen, Germany; the late Professor Henri Poincaré, of Paris, France; the late Professor Sir William Ramsay, of London, England; Professor Senator Vito Volterra, of Rome, Italy; Professor Carl Størmer, of Christiania, Norway. In these commemorative volumes there appear also reproductions of responses from American and foreign universities and scientific societies to the invitation of the Institute; the addresses of Governor Colquitt, Chief Justice Brown of Texas, Bishop Gailor of Tennessee, the inaugural poem of Dr. Henry van Dyke of Princeton, and the dedicatory sermon by Dr. Charles F. Aked of San Francisco; together with the addresses delivered by the presidents or other official representatives of Amsterdam, Glasgow, London, Oviedo, Paris, Rome, Baylor, Chicago, Columbia, Lehigh, Princeton, Texas, Vanderbilt, and Virginia

universities; and a variety of other literary and artistic performances which are not easily classified in a brief résumé.

THE FACULTY

For the staff of the Institute the best available instructors are being sought in the hope of assembling in Houston a group of scientists and scholars through whose productive work the new university may come into a place of importance among the established institutions of the country. Of those selected for positions on the staff it is possible to announce at this time the following appointments, the names appearing in alphabetical order:

Edgar Altenburg, M.A., Ph.D. (Columbia), of Elizabeth, New Jersey; Assistant in Biology at Columbia University; Instructor in Biology.

Philip Hechman Arbuckle, Ph.B. (Chicago), of Georgetown, Texas; Director of Athletics in Southwestern University; Instructor in Physical Education at the Rice Institute; Assistant Professor of Physical Education and Director of Athletics.

Stockton Axson, M.A. (Wesleyan), Litt.D. (Pittsburgh), L.H.D. (Wesleyan), of Princeton, New Jersey; formerly of the University of Vermont and of Adelphi College; Professor of English Literature in Princeton University; Professor of English Literature.

Walter Arthur Blakeslee, B.Sc. in M.E. (Illinois), of Kansas City, Missouri; formerly with the Westinghouse Machine Company and lately with the Ford Motor Company; Instructor in Mechanical Engineering.

Thomas Frederic Blanchard, Litt.B. (California), M.A. (Yale), of Berkeley, California; formerly California Alumni Fellow and Assistant in Rhetoric at Yale University; Instructor in English at the University of California; Assistant Professor of English.

Thomas Lindsey Blayney, M.A. (Centre), Ph.D. (Heidelberg), of Danville, Kentucky; Professor of European Literature and the History of European Art in Central University of Kentucky; Professor of German.

Robert Granville Caldwell, B.A. (Wooster), Ph.D. (Princeton), of Wooster, Ohio; formerly Fellow of Princeton University; Professor of Economics in the College of Wooster; Assistant Professor of History.

James Henry Chillman, Jr., M.Sc. in Architecture (Pennsylvania), of Philadelphia, Pennsylvania; formerly Alumni Fellow in Architecture at the University of Pennsylvania; Instructor in Freehand Drawing at the University of Pennsylvania; Instructor in Architecture.

Percy John Daniell, M.A. (Cambridge), of Liverpool, England; Senior Wrangler and Rayleigh Prizeman of the University of Cambridge; formerly Lecturer in Mathematics at the University of Liverpool; Research Associate of the Rice Institute; Assistant Professor of Applied Mathematics.

Nicholas Diamant, B.A. (Robert), M.Sc. in E.E. (Union), of Schenectady, New York; formerly Instructor in Hydraulics and Mathematics at Union College; Fellow in Physics at the Rice Institute; Instructor in Engineering.

Griffith Conrad Evans, Ph.D. (Harvard), of Boston, Massachusetts; formerly Instructor in Mathematics at

Harvard University; Sheldon Fellow of Harvard University at the University of Rome; Assistant Professor of Pure Mathematics at the Rice Institute; Professor of Pure Mathematics.

Major Joseph Frazier, United States Army, Retired; Graduate United States Military Academy at West Point; sometime Professor of Military Science and Tactics and Commandant of Cadets, University of Missouri; lately Major of the First Infantry and Twenty-sixth Infantry, United States Army; Professor of Military Science and Tactics.

Gerald Fogarty Galloway, B.Sc. in E.E. (Colorado), of Lincoln, Nebraska; formerly with the Engineering Department of the Chicago, Burlington & Quincy Railroad; Instructor in Engineering.

Denton Loring Geyer, M.A. (Wisconsin), Ph.D. (Illinois), of Roswell, New Mexico; formerly Fellow and Assistant in Philosophy at the University of Illinois; Assistant in Philosophy and Education at the Rice Institute; Instructor in Philosophy and Education.

Clyde Chew Glascock, Ph.D. (Johns Hopkins), of New Haven, Connecticut; formerly Fellow of Johns Hopkins University; Assistant Professor of German in Yale University; Assistant Professor of Modern Languages.

William Caspar Graustein, M.A. (Harvard), Ph.D. (Bonn), of Cambridge, Massachusetts; formerly Sheldon Fellow of Harvard University; Instructor in Mathematics at Harvard University; Assistant Professor of Mathematics.

Albert Léon Guérard, B.A. (Paris), Agrégé de l'Uni-

versité de France, of Palo Alto, California; formerly Junior Professor of French Literature and Examiner in History, State Normal School, Paris; later Instructor in the Romanic Languages at Williams College; Associate Professor of French in the Leland Stanford Junior University; Professor of French.

Raymond Preston Hawes, M.A. (Brown), of Ithaca, New York; Susan Linn Sage Scholar in Sage School of Philosophy, Cornell University; Instructor in Education.

Claude William Heaps, B.Sc. (Northwestern), Ph.D. (Princeton), of Columbia, Missouri; formerly Class of 1860 Experimental Science Fellow of Princeton University; Instructor in Physics at the University of Missouri; Instructor in Physics.

Arthur Romaine Hitch, B.A., M.Sc. (Washington College), Ph.D. (Cornell), of Syracuse, New York; formerly Assistant Instructor in Chemistry at Cornell University; Research Chemist for the Solvay Company; Instructor in Chemistry.

Arthur Llewelyn Hughes, B.A. (Cambridge), D.Sc. (Liverpool), of Cambridge, England; Research Scholar of Emmanuel College, MacKinnon Student of the Royal Society of London, Assistant Demonstrator in Physics at the Cavendish Laboratory of Cambridge University; Assistant Professor of Physics.

Herbert Kay Humphrey, B.Sc. in E.E. (Illinois), M.Sc. in E.E. (Union), E.E. (Illinois), of Schenectady, New York; Assistant Consulting Engineer of the General Electric Company; Instructor in Electrical Engineering.

Julian Sorell Huxley, B.A. (Oxford), of Oxford, England; Newdigate Prizeman of the University of Ox-

ford; formerly Lecturer in Biology in Balliol College, and Intercollegiate Lecturer in Oxford University; Research Associate of the Rice Institute; Assistant Professor of Biology.

Frederick J. Lewis, B.Sc. in C.E. (Maine), of Springfield, Massachusetts; Instructor in Civil Engineering at Pennsylvania State College; Instructor in Civil Engineering.

Roy Petran Lingle, Litt.B. (Princeton), of Philadelphia, Pennsylvania; Master in English at the Episcopal Academy of Philadelphia; Instructor in English.

Edgar Odell Lovett, Ph.D. (Virginia and Leipsic), LL.D. (Drake and Tulane), of Houston, Texas; formerly Professor of Mathematics in Princeton University, and later Head of the Department of Astronomy in the same institution; President of the Institute; Professor of Mathematics.

Lawrence Francis Hawkins Lowe, M.A. (Princeton), of Cleveland, Ohio; Instructor in French at Hoosac School; Instructor in French.

John Thomas McCants, M.A. (Virginia and Yale), of Houston, Texas; formerly Scholar at the University of Virginia, and University Fellow at Yale University; Secretary to the President; Instructor in English.

Hugh Miller, C.E. (Princeton), of Potsdam, New York; Professor of Civil and Sanitary Engineering at the Clarkson College of Technology; Lecturer in Civil Engineering.

Hermann Joseph Muller, Ph.D. (Columbia), of New York City; Assistant Instructor in Biology at Columbia University; Instructor in Biology.

Frank D. Murnaghan, M.A. (National University of Ireland), Ph.D. (Johns Hopkins), of Baltimore, Maryland; Fellow by Courtesy of Johns Hopkins University; Instructor in Mathematics.

Joseph Horace Pound, B.Sc. in M.E. (Missouri), of Pittsburgh, Pennsylvania; Instructor in the School of the Westinghouse Machine Company; Instructor in Mechanical Engineering.

Michael James Roach, B.Sc. in C.E. (Clarkson), of New York City; formerly with the Turner Construction Company of New York; Instructor in Civil Engineering.

Herbert Nelson Roe, B.A. (Colorado), of Chicago, Illinois; Director of Physical Education in the Public Schools of Rock Island, Illinois; Instructor in Physical Education.

Frank Barron Russell,[1] Ph.B. (Chicago), M.A. (Harvard), of Chicago, Illinois; Instructor in English at the University of Minnesota; Fellow in English at the University of Chicago; Instructor in English.

John Clark Tidden, of Philadelphia, Pennsylvania; Fellow and Traveling Scholar of the Pennsylvania Academy of Fine Arts; Instructor in Architectural Drawing and Painting.

Radoslav Andrea Tsanoff, B.A. (Oberlin), Ph.D. (Cornell), of Worcester, Massachusetts; formerly Sage Fellow of Cornell University; Instructor in Philosophy at Clark University; Assistant Professor of Philosophy.

Charles Frederick Ward, M.A. (Toronto), Ph.D. (Chicago), of Calgary, Canada; Associate Professor of

[1] Died March 27, 1917.

French and German in Calgary College; Instructor in French.

William Ward Watkin, B.Sc. in Arch. (Pennsylvania), M.A.I.A., of Houston, Texas; formerly Scholar in Architecture in the University of Pennsylvania; local representative of Messrs. Cram and Ferguson, the supervising architects of the Institute; Instructor in Architecture at the Rice Institute; Assistant Professor of Architecture.

Rolf Felix Weber, Ph.D. (Berlin), of Berlin, Germany; Lecturer and Instructor at the University of Pennsylvania; Instructor in German.

Harry Boyer Weiser, M.A. (Ohio State), Ph.D. (Cornell), of Memphis, Tennessee; formerly Assistant Instructor in Chemistry at Cornell University; Assistant Professor of Chemistry in the University of Tennessee; Instructor in Chemistry.

Gerald Louis Wendt, M.A., Ph.D. (Harvard), of Boston, Massachusetts; Austin Teaching Fellow of Harvard University; Instructor in Chemistry.

Harold Albert Wilson, F.R.S., M.A. (Cambridge), D.Sc. (London), of Montreal, Canada; Fellow of Trinity College, Cambridge University; formerly Professor in King's College, London; Research Professor of Physics in McGill University; Professor of Physics.

Stanley D. Wilson, M.A. (Wesleyan), Ph.D. (Chicago), of Chicago, Illinois; formerly Instructor in Chemistry at Washburn College and the University of Kansas; Instructor in Chemistry at the University of Chicago; Instructor in Chemistry.

ASSISTANTS AND FELLOWS

Hubert Evelyn Bray, B.A. (Tufts), M.A. (Harvard), of Great Yarmouth, England; formerly Instructor in Mathematics at Tufts College and at Lafayette College; Fellow in Mathematics.

Walter Lynn Cheney, B.A. (Oberlin), M.A. (Nebraska), of Lincoln, Nebraska; Graduate Assistant in Physics at the University of Nebraska; Fellow in Physics.

Robert Emmett Cummings, B.A. (Rice), of Houston, Texas; Assistant in Physical Education.

Alfred Alexander Dixon, B.Sc. (Guilford), M.A. (Haverford), of Guilford, North Carolina; Professor of Physics in Guilford College; Fellow in Physics.

Thomas Paul Frizzell, B.A. (Texas Christian University), of Knox City, Texas; Fellow in Biology.

Frederick R. Lummis, M.D. (Pennsylvania), of Houston, Texas; Medical Adviser to the Committee on Outdoor Sports.

Samuel Glenn McCann, B.A. (Wooster), of Dresden, Ohio; Principal of the high school at Navarre, Ohio; Fellow in History.

Norman Hurd Ricker, B.A. (Rice), of Galveston, Texas; Fellow in Mathematics.

Jacob L. Sherrick, B.Sc. (Penna. State), of Pittsburgh, Pennsylvania; Assistant Chemist in the United States Bureau of Mines; Fellow in Chemistry.

Arthur S. Winsor, B.A. (Mt. Allison), of Woodstock, New Brunswick; Fellow in Mathematics.

PRELIMINARY ANNOUNCEMENT

FELLOWSHIPS

WHILE seeking to develop its students in character, in culture, and in citizenship, the Rice Institute will reserve for scholarship its highest rewards and in particular for evidences of creative capacity in productive scholarship. To encourage this devotion to learning a series of undergraduate scholarships and graduate fellowships will be devised to be awarded preferably to those students who have been in residence at the Institute for at least one year. Moreover, the varied opportunities for self-help in a growing institution in a large city should aid in enabling any young man of determination to earn his education in a thoroughly democratic college community. There may thus be realized the founder's desire that the advantages of his philanthropy should be brought within the reach of the promising student of slender means.

Furthermore, the Institute would interpret in a very large way its dedication to the advancement of letters, science, and art. It would not only look to the employment of these disciplines in the development of the life of the individual and in that of the race, but it would also play its part in the progress and enlargement of human knowledge by the contributions of its own resident professors and scholars. Accordingly there should always be associated with the staff of the Institute a group of advanced students in training for careers both as teachers and researchers: with this end in view, graduate fellowships will

be awarded from time to time to degree-bearing students of the Institute or other educational foundations of similar standing.

REQUIREMENTS FOR ADMISSION

CANDIDATES for admission to the Institute who present satisfactory testimonials as to their character will be accepted either upon successful examination in the entrance subjects or by certificate of graduation from an accredited public or private high school. The standard requirements for matriculation are determined by the system of units given below. A unit represents a course of study pursued five hours a week for an academic year. Fourteen such units are required for entrance in full standing to the freshman class of the Institute. A candidate offering twelve units may be accepted with conditions, but all deficiencies must be removed, in accordance with regulations published elsewhere in this announcement, before the student will be recognized as a candidate for any degree.

From the following list every candidate will be required to present three units in English, two and one-half units in mathematics, two units in history, and three units in one foreign language or two units in each of two modern languages. For the present, in the case of mature candidates whose preparation has not been adequate, compliance with the requirements in foreign languages may be temporarily deferred. No student will be admitted to

a special schedule who has not satisfied in full the requirements for admission to the freshman class.

Entrance examinations will be held at the Institute beginning September 19th, 1917, and again during the week beginning May 20th, 1918. Applications for the privilege of taking these examinations must be received at the University Office three weeks in advance of the beginning of the examinations. Such applications must be accompanied by statements and records from schools attended by candidates. Appropriate blanks for such applications and records may be obtained from the University Office of the Rice Institute on request.

LIST OF SUBJECTS WITH VALUES IN UNITS

Botany 1; Chemistry 1; English (Reading and Practice 2, Study and Practice 1); French (Elementary 2, Intermediate 1); German (Elementary 2, Intermediate 1); Greek (Grammar and Elementary Prose Composition 1, Xenophon 1, Homer—*Iliad*, Books I–III 1); History (Ancient 1, Mediæval and Modern 1, English 1, American 1); Latin (Grammar, Elementary Prose Composition and Cæsar 2, Cicero 1, Virgil 1); Mathematics (Algebra 1½, Plane Geometry 1, Solid Geometry ½, Trigonometry ½); Spanish (Elementary 2, Intermediate 1); Physics 1; Physical Geography ½; Physiology ½; Zoölogy 1. Substitutes for certain of these subjects may be considered in individual cases.

The terms of admission to the Institute are based on

the recommendations of the Carnegie Foundation for the Advancement of Teaching as expressed in the Documents of the College Entrance Examination Board. Complete information with respect to further details of these requirements will be forwarded by the Institute to any candidate upon receipt of a request addressed to the University Office of the Institute.

EXPENSES

THE opportunities for study and research offered by the Rice Institute are open without tuition both to young men and to young women. A small deposit will be required to cover possible breakage in the laboratories and losses from the libraries; the balance from this contingent fee is returnable after the close of the session.

Students, of course, are expected to meet all expenses incurred in the purchase of text books, note books, examination papers, drafting instruments and the materials actually used up in the elementary courses in pure and applied science.

No student in arrears in his bills to the Institute will be admitted to any of the examinations.

Rooms in the residential halls for men, completely furnished exclusive of linen, together with table board at the Institute commons, may be had at prices ranging from twenty-two dollars a month of four weeks, payable monthly in advance. These residential halls are of absolutely fireproof construction, heated by steam, lighted by electricity, cleaned by vacuum apparatus, and equipped

with the most approved form of sanitary plumbing, providing adequate bathing facilities on every floor. The rooms will be let in the order of applications received. Applications must be accompanied by deposits of ten dollars. Inasmuch as each year the accommodations now adequate to house some three hundred and fifty men have all been engaged before the opening of the session, reservations should be made early. Diagrams showing the floor plans will be sent on request to any one who may be interested.

Accommodations for the residence of young women on the university grounds are not available at present. However, while attending to their duties on the campus the young women of the university have access to adequate rest rooms, tennis courts, and other forms of recreation under the constant supervision of Mrs. Sara Stratford, Adviser to Women. Information concerning desirable places of residence for young women students may be had at the University Office.

COURSES OF INSTRUCTION FOR DEGREES

ALTHOUGH it is the policy of the new institution to develop its university programme rather more seriously from the science end, there are also being provided facilities for elementary and advanced courses in the so-called humanities, thereby enabling the Institute to offer both the advantages of a liberal general education and those of special and professional training. Extensive general

courses in the various domains of scientific knowledge will be available, but in the main the programme consists of subjects carefully coördinated and calling for considerable concentration of study. These programmes have been so arranged as to offer a variety of courses in arts, in science, in letters, and in their applications to the several fields of engineering, architecture, and other regions of applied science, leading after four years of undergraduate work to the degree of Bachelor of Arts. Degrees will also be offered in architecture and in chemical, civil, electrical, and mechanical engineering. Furthermore, for the degrees of Master of Arts, Doctor of Philosophy, and Doctor of Engineering, every facility will be afforded properly qualified graduate students to undertake lines of study and research under the direction of the Institute's resident and visiting professors.

The academic programmes of study leading to the degree of Bachelor of Arts after four years of study are of a common type for the first two years, but for the third and fourth years are differentiated into two forms: first, general courses leading to the degree of Bachelor of Arts, either with some grade of distinction or without special mention, and second, honors courses leading to the degree with first, second, or third class honors. These two types will be referred to in the sequel as general courses and honors courses respectively.

The general course leading to the degree of B.A. has been arranged to give thorough training to those students who are seeking university instruction in literary and scientific subjects either as a part of a liberal education or as preliminary to entering upon a business or professional

career. The general course therefore involves the study of several subjects up to a high university standard but does not include a highly detailed specialized study of any one subject such as is necessary before research work or university teaching can be profitably undertaken. Students wishing to specialize with a view to research work and university teaching may either take an honors course and then proceed by graduate study to the degrees of M.A. and Ph.D., or they may first take a general B.A. course and after completing it proceed by graduate study to the higher degrees.

The attention of students intending to enter the profession of engineering or architecture is called to the great advantages in first taking a general or honors academic course before beginning special study in engineering or architecture. At present the Institute is not offering courses leading to degrees in law and medicine, but students looking forward to such careers will find in the earlier years of the B.A. course all the requirements for admission to many medical and law schools, provided suitable subjects are chosen. However, attention is called to the fact that several professional schools of law and medicine are now requiring bachelor degrees for admission.

As has already been intimated, the course for the degree of B.A. extends over four years. During the first two years a considerable part of the work is prescribed, while during the last two years each student is allowed, within certain restrictions, to select the subjects he studies. In the majority of the courses the formal instruction offered consists of three lectures a week together with

laboratory work in certain subjects. Examinations are held from time to time and at the end of each term. These examinations are conducted under a student honor system. In determining the standing of a student in each class both his work during the term and the record of his examinations are taken into account.

Of subjects included in the B.A. courses the following are now available.

Group A	Group B
1. English	1. Pure Mathematics
2. French	2. Applied Mathematics
3. German	3. Physics
4. Spanish	4. Chemistry
5. Economics	5. Biology
6. Education	6. Chemical Engineering
7. History	7. Civil Engineering
8. Philosophy	8. Electrical Engineering
9. Architecture	9. Mechanical Engineering

Instruction in advanced Latin is also offered.

Candidates for the degree of Bachelor of Arts of the Rice Institute will be required to select studies from the preceding groups according to the yearly programmes exhibited below.

At the beginning of each year of his residence at the Institute, each student is assigned to some member of the faculty who will act as the student's personal adviser in the selection of his studies and courses and in other matters pertaining to life at the Institute.

First Year

(1) Pure mathematics
(2) English
(3) A modern language
(4) A science
(5) One other subject

Second Year

(1) Pure mathematics or a science
(2) English
(3) A modern language[1]
(4–5) Two other subjects

At the beginning of the third year students may elect to take either a general course or an honors course.

Third Year General B.A. Course

Four subjects, of which two must have been taken in the second year and one in both first and second. At least one subject from each of the groups A and B must be taken. Students will receive advice in the selection of their subjects.

Fourth Year General B.A. Course

Four subjects, two of which must have been taken in the third year and one in both second and third or in first

[1] Students who enter with credit in two modern languages may substitute another subject for (3) in the second year.

and third. At least one subject from each of the groups A and B must be taken.

To students who have completed the general course the B.A. degree will be awarded either with some grade of distinction or without special mention.

The third and fourth year honors courses are intended for students who wish to specialize in particular branches of knowledge with a view to research work or teaching or later professional studies.

In view of these special objects the requirements in such courses will be more severe than in the general courses in the same subjects. For this reason it is recommended that students exercise due caution and seek advice before electing to take an honors course. Only those students who have shown in their first and second years that they are especially well qualified will be permitted to take an honors course. A student proposing to take an honors course must satisfy the department concerned that he is qualified to proceed with the study of that subject. He will be required to take the lectures and practical work provided for honors students in that subject during each of the two years and in addition certain courses in allied subjects.

In 1916–17 honors courses will be available as follows:

(1) Pure and applied mathematics
(2) Theoretical and experimental physics
(3) Modern languages and literatures
(4) Biology
(5) Chemistry

The following programme of honors courses in physics may be taken as typical of such courses:

Third year, five subjects: (1) mathematics, (2) physics 300, (3) physics 310, (4) physics 400, (5) one other subject.

Fourth year, five subjects: (1) mathematics, (2) physics 400, (3) physics 420, (4) physics 500, (5) one other subject.

The degree of B.A. with first, second, or third class honors will be awarded at the end of the fourth year to students who have completed an honors course. Candidates for honors who fail may be excused such part of a general course as may be equivalent to the work they have done. Candidates for honors who are not making satisfactory progress may be required to discontinue their honors course and may be excused such part of a general course as may be equivalent to the work they have done.

A student who has completed a general or an honors course for the Bachelor of Arts degree may obtain the Master of Arts degree after the successful completion of one year of graduate work. A candidate for the degree of Master of Arts must select a principal subject and will be required to take such courses in that subject and allied subjects as may be determined for each individual case. He must also undertake research work under the direction of the department of his principal subject and submit a thesis embodying the results of this work.

A student who has completed a general course for the Bachelor of Arts degree may obtain the degree of Doctor

of Philosophy after not less than three years' graduate study and research work. A student who has obtained the Bachelor of Arts degree with first or second class honors may obtain the Doctor of Philosophy degree after not less than two years' graduate study and research work. Candidates for the degree of Doctor of Philosophy must submit a thesis and pass a public examination.

STANDING IN SCHOLARSHIP OF UNDERGRADUATE STUDENTS

Removal of entrance conditions and fulfilment of Freshman and Sophomore requirements.—A student having entrance conditions should remove them before the beginning of his third year of residence, and may not, after that time, remove them by passing entrance examinations. A student who has failed to remove his entrance conditions by the beginning of his third year of residence, or who has not by that time completed the prescribed Freshman courses (in mathematics, English, foreign languages and science), will not be allowed to carry more than the regular schedule during his third year of residence. And if, by the beginning of his fourth year of residence, a student has not also completed the prescribed Sophomore courses (in English, foreign languages, and mathematics or science), he will not be allowed to carry more than the regular schedule during his fourth year of residence.

Dropping of students for deficiencies in scholarship.—A student will be required to withdraw from the Institute

if he fail in as much as one-half of the work of his schedule.

Probation.—A student who has passed in more than one-half of his work may, nevertheless, be placed on probation if, during his Freshman or Sophomore years, he has received in any one term, V's[1] in two courses, or has failed to obtain a grade of III or better in at least one course, and if, during his Junior and Senior years, he has received in any one term a V in one course, or has failed to obtain a grade of III or better in at least one course. A student who is carrying less than full schedule may be placed on probation if he has received in any one term a V in one course, or has failed to obtain a grade of III or better in at least two courses. Students who carry a schedule of two courses or less are expected to obtain a grade of III or better in each course. If a student who has thus been placed on probation fails to improve materially in his standing, he is dropped from the Institute. The length of the period of probation during which a student who is on probation may remain in the Institute is determined in each special case by the Faculty. A student on probation may be dropped at any time at the discretion of the Faculty. A student who is on probation must concentrate his energies on his academic work and may not take part in extra-academic activities.

Promotion.—To attain Sophomore standing, a student must have obtained in four of the five courses of the Freshman year courses, passing grades of which two must have been III or better. To attain Junior standing, a

[1] The symbols have the following meanings: I Very high standing, II High standing, III Medium standing, IV Low standing, V Failure.

student must have obtained in at least nine of the ten courses of the Freshman and Sophomore years' courses, passing grades of which four must have been III or better. To attain Senior standing, a student must have obtained passing grades, of which six must have been III or better, in at least thirteen courses of the five courses of the Freshman year, the five courses of the Sophomore year, and the four courses of the Junior year, required for full Senior standing. To obtain the degree of Bachelor of Arts, a student must have obtained passing grades, of which eight must have been III or better, in five Freshman courses, five Sophomore courses, four Junior courses, and four Senior courses, required for the first degree. Attention is called to the fact that this four years' course is built up by years. Accordingly four courses of the Freshman and Sophomore years respectively will not be credited as the equivalent of four courses of the Junior and Senior years respectively. A higher standard and wider range of collateral work is required of Juniors and Seniors who elect in either of those years an elementary subject of the Freshman and Sophomore years.

Beginning with the academic year 1917–18 courses in military science and tactics will be required of all students in addition to their regular academic schedules.

SUBJECTS OF INSTRUCTION FOR 1916–17

Of the courses to be offered during the scholastic year 1916–17 it is possible to announce those described below. The numbers designating the courses have the following

signification: courses whose numbers begin with 1 are open to all students of the Institute; courses whose numbers commence with 2 are open to sophomores, juniors, and seniors; those beginning with 3 are open to juniors and seniors; those beginning with 4 are senior courses. In this connection it may be remarked that seniors were admitted to the Institute for the first time in 1915–16. Courses whose numbers end in 0 extend throughout the year; those ending in 1, 2, 3, are first, second, and third term courses, respectively. Unless otherwise indicated, all courses consist of at least three exercises a week.

For each course the days of the week and the hours have been indicated. The Roman numerals refer to the group in the examination schedule. In general, subjects which fall in the same group may not be taken in the same year. Any possible exceptions to this rule must be arranged through the University Office at or before the time of registration.

ENGLISH 100. A course in rhetoric, with the use of a text-book, and constant practical exercise in writing. Selected English authors will be read, primarily with the purpose of giving the student some sense of literary values and standards of literary style. It is a course in appreciation and expression.

M W F 9:30, 10:30, or 11:30 II

ENGLISH 200. A systematic study of the history of English literature from its beginnings, by the use of text-books and by lectures. In addition to the formal study of the history, there will be a rapid reading of some of the works of authors representative of the chief epochs

in literary history. In connection with the Elizabethan age Shakespeare will be studied in some detail.

T Th S 9:30 or 10:30 II

ENGLISH 300. Eighteenth and Nineteenth Century English Literature. A study of the literature of England from Alexander Pope to the end of the nineteenth century. The first part of the course will be devoted to the poetry and prose of the eighteenth century, with especial emphasis on the Romantic-Naturalistic movement. The remainder of the course will be given to the study of representative poets and essayists of the nineteenth century; consideration of the nineteenth century novelists will be taken up in the English 400 course. Among the poets and essayists studied will be Wordsworth, Coleridge, Byron, Shelley, Keats, Tennyson, Browning, Arnold, De Quincey, Lamb, Hazlitt, Carlyle, Ruskin. It is the aim of this course to combine literary interpretation and appreciation with some exposition of the historical, political, social, and philosophical aspects of literary history. Written exercises will be required of those who take the course. M W F 11:30 II

ENGLISH 400. Modern English and American Literature. There are three elements in this course: (1) Nineteenth Century British and American Fiction, involving a study of Dickens, Thackeray, George Eliot, Meredith, Kipling, Hawthorne, and Poe; (2) American Literature, a review of the course of the literature of America from Benjamin Franklin to the present time, based, in part, upon books of selected readings from American poets, essayists, and humorists; (3) Modern Drama, a study of representative dramatists from Ibsen to the present time, based on the reading of plays English, American, and

European in translation. Written work will be required of students who take the course. M W F 10:30 II

FRENCH 100. Elementary French. A general introductory course, in which the method adopted is based on extensive and rapid reading, without sacrificing the study of grammar and the practice of conversation.
M W F 8:30 or T Th S 8:30 III

FRENCH 110. Elementary French. A general introductory course, specially intended for students who desire to take more than one year of French.
M W F 8:30 or T Th S 8:30 or 9:30 III

FRENCH 200. Second Year French. Syntax, composition, conversation based on rapid reading, and general survey of French literature.
M W F 9:30 or 10:30 III

FRENCH 300. Third Year French. Advanced composition, themes, lectures in French, discussions and readings on classical French literature of the sixteenth, seventeenth, and eighteenth centuries. M W F 9:30 III

FRENCH 400. Fourth Year French. Composition (themes and essays); literary translation; lectures, discussions, and readings in nineteenth century literature. (Not offered in 1917–18). T Th S 11:30 XI

FRENCH 410. History of French Civilization. A general survey of political, social and cultural conditions from the earliest times to the present day. Lectures in French. Assigned readings, essays, reports and debates. Special library provision has been made for this subject. Prerequisite: French 300 or preferably French 400.
T Th S 8:30 III

GERMAN 100. Elementary German. Grammar, reading, conversation, and composition. Collateral reading in history.

M W F 9:30 or 11:30 or T Th S 10:30 VII

GERMAN 200. Second Year German. Historical, descriptive, and narrative prose. Elements of the history of German civilization. Lectures and collateral reading.

M W F 8:30 or 11:30 VII

GERMAN 300. Third Year German. The literature and civilization of the eighteenth and nineteenth centuries in Germany. Written reports in German, lectures, and collateral reading T Th S 9:30 VII

GERMAN 310. Third Year German. Alternate course. The Middle High German Epic. Introduction to the literature of chivalry. T Th S 10:30 VII

GERMAN 400. Fourth Year German. Intensive study of some period or group of writers in the eighteenth or nineteenth century. Lectures and discussions; essays and reports in German; collateral reading.

T Th S 8:30 VII

GERMAN 410. German Literature in the Twelfth and Thirteenth Centuries. This course is primarily for advanced students specializing in German, and is intended to give a reading knowledge of Middle High German. Selections from the writings of Walther von der Vogelweide, Hartmann von Aue, Gottfried von Strassburg, and Wolfram von Eschenbach will be read. Lectures and discussions; translation; collateral reading; essays and reports in German. T Th S 9:30 I

SPANISH 300. Elementary Spanish. Grammar, composition, and selections for reading from modern Spanish authors. Stress is laid on accurate Castilian pronunciation, on the essentials of grammar, and on careful translation into idiomatic English of simple Spanish prose.

T Th S 11:30 XII

SPANISH 310. General survey of Spanish literature and in particular that of the nineteenth century. The readings will include selections from Cervantes, Lope de Vega, Calderón, Pereda, Galdos and Valdes.

M W F 11:30 XII

LATIN 100. Selections from Cicero, Nepos, Ovid, Sallust, and Livy. Course in Latin grammar. Latin composition and essays. Roman literature.

T Th S 9:30 IX

LATIN 200. Selections from Cicero, Livy, Virgil, Horace, and Tacitus. Roman literature. Latin composition and essays. M W F 9:30 XI

LATIN 300. Extensive reading in Ovid, Horace, Juvenal, Sallust, Livy, Tacitus, Plautus, and Terence. Essays and advanced composition. Versification, Roman literature. Chapters in J. E. Sandys' "Companion to Latin Studies" on epigraphy, palæography, art, and textual criticism.

MATHEMATICS 100. Trigonometry, Analytic Geometry, and Advanced Algebra, constituting the freshman course in mathematics which is required of all students in the Institute.

M W F 8:30 or 9:30 or T Th S 8:30 or 9:30 I

MATHEMATICS 110. Plane Analytic Geometry, Topics from Algebra and Analytic Geometry of Three Dimensions. For students who are already well grounded in trigonometry. The course will be given if applications are received from a sufficient number of properly qualified students. T Th S 8:30 I

MATHEMATICS 200. Differential and Integral Calculus. This course, including the study of derivatives, indefinite and definite integrals, infinite series, and Taylor's theorem, is the foundation of theoretical physics and advanced mathematics, and the ideas introduced are, as ideas, of fundamental importance in many branches of modern thought. T Th S 8:30 I

MATHEMATICS 210. Differential and Integral Calculus. This course covers the ground of Course 200, but is more complete and goes further. It is intended for students who have greater facility in mathematical reasoning. It is a sufficient introduction to Mathematics 310, 320, and 330, and is open to students who obtain high grades in Mathematics 100 or otherwise satisfy the instructor of their fitness to take the course.
T Th S 8:30 I

MATHEMATICS 220. Modern Geometry and Algebra. Introduction to modern methods in geometry and algebra; abridged notation; line coördinates; reciprocal polars; cross ratio; projection; linear transformations; inversion. T Th S 9:30 XII

MATHEMATICS 300. Advanced Calculus and Differential Equations. Differentiation and integration of functions of several variables; multiple integrals; introduction to the theory of differential equations. This course

or Mathematics 310 should be taken by students whose major interest lies in physics or engineering; it is open to those who pass successfully in Course 200 or 210 in mathematics. M W F 8:30 I

MATHEMATICS 310. Advanced Calculus and Differential Equations. Applications of calculus to the study of curves and surfaces; differential equations; multiple and improper integrals; Fourier's Series. This is a more extended course than Course 300, and is intended for students who have greater facility in mathematical reasoning. It is recommended to students who are specializing in mathematics, physics, and engineering.
M W F 8:30 I

MATHEMATICS 400. Theory of Functions of a Real Variable. This course consists of the theory of sets of points, the Lebesgue and Stieltjes integrals; integral equations; divergent series, and their applications to analysis.

MATHEMATICS 410. Theory of Functions of a Complex Variable. An introductory course in the general theory of functions of a complex variable. Open to students who satisfy the instructor that they are prepared to take the course. Not offered in 1917–18.

MATHEMATICS 420. Differential Equations. Ordinary and partial differential equations, with an introduction to integral equations. This course is designed to follow Course 310. T Th S 11:30 I

MATHEMATICS 430. Line Geometry. A study of the geometry in which the line is the fundamental element. Open to students who satisfy the instructor that they are prepared to take the course. M W F 11:30 X

APPLIED MATHEMATICS 200. Mechanics. A study of the fundamental principles, with applications to machines and structures. It includes elementary statics, dynamics, and hydraulics. This course is a necessary part of the engineering course and is recommended to students of physics. M W F 10:30 XII

APPLIED MATHEMATICS 310. Statistical Economics. An analysis of statistics as applied to economics and biology, theory of probability, mathematical theory of investment. T Th S 9:30 V

APPLIED MATHEMATICS 410. Aërodynamics and Ballistics. This course investigates the dynamics of aëroplanes and projectiles, in particular, problems of resistance, stability, and trajectory. M W F 9:30 XII

Besides these courses as listed above, to be given during the academic year 1917–18, others may be given to suit the needs of students. Reading courses are also offered in analysis, geometry, and applied mathematics.

PHYSICS 100. A course of three lectures and three hours of practical work per week on heat, light, sound, and experimental dynamics. The lectures are fully illustrated by experiments.
T Th S 9:30 IX Laboratory T or Th 1:30–4:30

PHYSICS 200. A course of three lectures and three hours of practical work per week on electricity and magnetism. The lectures are fully illustrated by experiments.
M W F 9:30 IX Laboratory M 1:30–4:30

PHYSICS 300. A course of three lectures and three hours of practical work per week on properties of matter,

thermodynamics, theory of vibrations and geometrical optics.

M W F 9:30 IX Laboratory F 1:30–4:30

PHYSICS 310. A course of three lectures and three hours of practical work on electricity and magnetism and physical optics.

M W F 10:30 XII Laboratory W 1:30–4:30

PHYSICS 400. Physics Colloquium. One meeting a week at which researches in physics will be discussed.

PHYSICS 410. This course consists of about nine hours a week practical work on exact measurements and research work in some branch of physics.

PHYSICS 500, 510. A course consisting of three lectures a week extending over two years on various modern developments in physics, including theory of heat conduction, advanced thermodynamics, electromagnetic theory of light, discharge of electricity through gases, Roentgen rays, electrical properties of flames and hot bodies, photo-electricity, theory of radiation, electron theory of properties of insulators and conductors, and constitution of matter. M W F 11:30 IX

PHYSICS 520. Research work in Physics.

CHEMISTRY 100. Elementary Chemistry. Two lectures, one recitation and three hours of laboratory work a week throughout the year. This course includes the general principles of theoretical chemistry, a description of the elements and their compounds, a brief survey of organic chemistry, and discussions of the common and industrial applications of the subject. The laboratory

work is illustrative of the facts and theories discussed in the lectures, with special attention to the laws of physical chemistry, and includes an introduction to the processes of qualitative and quantitative analysis.

M W F 9:30 V Laboratory M or T 1:30–4:30

CHEMISTRY 200. A condensed course giving the elements of qualitative analysis, quantitative analysis, and organic chemistry for students who are preparing for the study of medicine, for engineers (excepting chemical engineers), and for students specializing in biology or related sciences. Lectures: three hours a week. Laboratory: six hours a week for the year. Prerequisite: Chemistry 100. This course will not be accepted as a prerequisite to any of the advanced courses in Chemistry except Chemistry 320 and Chemistry 410. Not offered in 1917–18.

CHEMISTRY 210. Qualitative Analysis. Two lectures and six hours of laboratory work a week throughout the year. Prerequisite: Chemistry 100. A thorough discussion of the physical chemistry of solutions and the principles underlying chemical reactions precedes a study of the qualitative detection and separation of the commoner metals and acids. The laboratory work includes the analysis of a large number of solid mixtures, minerals, alloys, and commercial products, as well as an introduction to mineralogy and blowpipe analysis.

M W 10:30 V Laboratory T W 1:30–4:30

CHEMISTRY 220. Quantitative Analysis. Two lectures and six hours of laboratory work a week throughout the year. This course is open to students who have taken or are taking Chemistry 210. It embodies a study of representative processes in the quantitative determination of

the common metals and acids and a discussion of general analytical practice in science and the industries. Gravimetric, volumetric, and electro-analysis are included, with special emphasis on chemical mathematics and stoicheiometry.

T Th 11:30 VI Laboratory Th F 1:30–4:30

CHEMISTRY 300. Organic Chemistry. Lectures, recitations, and laboratory practice. Lectures: three hours a week. Laboratory: six hours a week. Prerequisite: Chemistry 210, except by permission of the Instructor in charge. The lectures treat of the elements and principles of organic compounds. The laboratory work consists in the preparation of typical carbon compounds, including some work in proximate organic analysis.

M W F 9:30 XI Laboratory W F 1:30–4:30

CHEMISTRY 310. Physical Chemistry. Lectures: three hours a week. Laboratory: six hours a week. Prerequisite: Chemistry 220, Physics 200 or taking 200, and Mathematics 200 or taking 200. A systematic presentation of modern chemical theories and their applications.

M W F 8:30 V Laboratory Th S 9:30–12:30

CHEMISTRY 320. Technical Chemistry. Lectures: two hours a week. Laboratory: six hours a week. Prerequisite: Chemistry 200 or 220. The lectures deal with the theory and practice of the methods as outlined in the laboratory work, as well as the technical processes calling for such tests. The laboratory work consists in the analysis of coal and coke, cements, fertilizers, minerals, iron and steel, and gases; the determination of the heating value of gaseous, liquid, and solid fuels; the sanitary analysis of water, the analysis of boiler waters and scale, petroleum oils, vegetable oils, and experience in the ma-

nipulation of many types of apparatus used in manufacturing plants. Within certain limits the work may be selected to suit the requirements of the individual student.

M W 10:30 VIII Laboratory M T 1:30–4:30

CHEMISTRY 400. Advanced Inorganic Chemistry. Prerequisite: Chemistry 310. Three lectures a week devoted to special topics in the field of inorganic chemistry, including the modern theories of the structure of the atom and the nature of matter.

CHEMISTRY 410. Colloid Chemistry. Lectures: three hours a week. Laboratory: three hours a week. Prerequisite: Chemistry 200 or 220 or taking 220. The course treats of the theories of colloid chemistry and their applications in biology and the arts.

CHEMISTRY 420. Electrochemistry. Lectures: two hours a week. Laboratory: six hours a week. Prerequisite: Chemistry 310, Physics 200. An exposition of the fundamental principles of the subject and their application to industrial processes. The laboratory work includes practice in the measurement of electrical constants; the conditions affecting electrolytic reactions; determination of current and energy efficiencies in electrolytic and electrothermal work; electroplating and electrorefining; tests of storage batteries; electrolytic and electrothermal preparations.

T Th 8:30 VII. Laboratory M W 1:30–4:30

CHEMISTRY 430. Advanced Organic Chemistry. Lectures, recitations, and laboratory practice. Lectures: three hours a week. Laboratory: six hours a week. Prerequisite: Chemistry 340. A course in advanced topics in organic chemistry, including stereochemistry.

CHEMISTRY 450. Advanced Quantitative Analysis. Prerequisite: Chemistry 230. Two lectures and 9 hours of laboratory work a week. The exact determination of a number of constituents in complex and difficultly soluble minerals and practice in the uses of the more refined procedures and instruments in gravimetric, volumetric, and gasometric analysis.

CHEMISTRY 470. Chemical Research. Chemical engineers and students who are specializing in chemistry may elect in their senior year at least nine hours a week in research under the direction of some member of the staff of instruction.

CHEMISTRY 480. Chemical Seminar. One hour a week. Participation in the seminar is required of all chemical engineers and students specializing in chemistry after the completion of their third year. Attendance is open to all members of the Institute. Discussions of general topics or of recent advances in the progress or the applications of chemistry. M 9:30

CHEMISTRY 500. Chemical Research. Chemical engineers or students who are specializing in chemistry are expected in their fifth year to elect at least nine hours a week in research under the direction of some member of the staff of instruction.

During the academic year 1917–18 the following courses outlined in previous announcements will, except in case of special requirement, be omitted: Chemistry 440, Advanced Qualitative Analysis; Chemistry 460, Industrial Chemistry; Chemistry 510, Theoretical Chemistry and Thermodynamics.

Biology 100. General Biology. This course will include a general study of the origin and constitution of living matter; the fundamentals of morphology and physiology as illustrated by selected animal and plant types; the development of the individual and of the race; together with a brief introduction to other biological ideas that are of general interest. The course is planned to meet the needs not only of those who intend to continue the study of biology, but also of those who wish to specialize in other subjects, but yet are desirous of getting some general knowledge of biology. It is a prescribed subject for those who wish to enter a medical college later, and it is thought that this course will prove valuable to those intending to study theology, philosophy, psychology, economics, or agriculture. Three lectures and one three-hour laboratory period a week.

T Th S 11:30 X Laboratory W or Th 1:30–4:30

Biology 200. Cellular Biology. This course is the logical sequel to Biology 100, and undertakes a more scientific examination of the foundation principles of life. It is essential for those who wish to continue in biology, but it should be of interest to students of other subjects as well. The course is very general in scope, including a study of all the important features of cell structure and activities, such as the constitution of protoplasm; its nutrition, metabolism, and mode of motion; irritability and the properties of nerve cells; the mechanism of development; youth and old age; and the physical basis of reproduction and heredity. Recent lines of experimental work in general physiology, embryology, and cytology will receive special attention. In the laboratory students will have an opportunity to study living and prepared specimens illustrating the course, and to become acquainted

with some of the methods of modern biological experiment and technique. Chemistry (high school or college) is prerequisite, or may, in special cases, be taken as a parallel course. Three lectures and six hours of laboratory a week. Given alternately with Biology 300; not offered in 1917–18.

Biology 210. Morphology of Animals. This course is intended chiefly for students who expect to continue in biology. It includes a study of the structure of typical representatives of each group (order) in the animal kingdom, together with a general survey of the related forms. The probable course of evolution of the various groups will also be considered. Three lectures and five hours of laboratory a week. This course is given alternately with Biology 310, to which it is prerequisite, and will be given in 1917–18.

T Th S 9:30 IX Laboratory T F 1:30–4:30

Biology 300. Heredity and Evolution. This course is open to juniors, and also to those sophomores who have obtained a grade of III or better in Biology 100. In the subject of heredity, special emphasis will be laid on the most modern advances, as this science has been revolutionized in recent years. Mendelism, mutation, and the constitution of the germ plasm as disclosed by breeding experiments and microscopic investigation, will be among the topics studied. Older theories, such as the inheritance of acquired characters, and applications of heredity, such as eugenics, will be considered in the light of the newer knowledge. Students will also receive training to enable them to work out actual cases of heredity. The laboratory work, which will consist of breeding experiments on Drosophila, will occupy about three hours a week, but

will not be at set hours. In the third term the chief topics will be: the general principles of evolution; the courses which evolution has taken in the plant and animal kingdoms; the descent of man; evolution in man to-day; also a brief discussion of cosmic and geological evolution in their relation to that of the organic world. In this term there will be theses and required reading, but no laboratory work. The course is given alternately with Biology 200, and will be given in 1917–18. M W F 9:30 X

Biology 310. Embryology. This course will consider in detail the development of typical representatives of the various groups of animals, invertebrate and vertebrate. It is intended for students who wish to continue in biology, and Biology 210, which is given alternately with it, must be taken as a prerequisite. Not offered in 1917–18.

Biology 500. Advanced Genetics. Reading and seminar work in modern genetics, accompanied by practical work and problems. Students will also be given research work to carry on in conjunction with the course. Graduate course.

Biology 510. General Problems of Biology. Reading, themes, and seminar work on advanced general topics of biology. Graduate course.

Biology 520. Special work in Biology. This course will consist of advanced work in some special field of biology and will be adapted to the needs of the particular student.

Economics 200. Elements of Economics. An introduction to the fundamental theories of economics and to their applications, with special reference to the problems of money, banking, transportation, international trade,

and business organizations. This course is planned to meet the requirements in industrial economics on the schedules of all engineering students.

T Th S 11:30 XI

ECONOMICS 310. Money and Banking; Principles of Business Administration; Business Law.

M W F 11:30 XI

EDUCATION 100. An introductory course in educational psychology, school and class management, and methods of teaching. Members of the class will study methods in use in the city schools, and will be given an opportunity there to conduct a class under the supervision of its regular teacher.

T Th S 8:30, 9:30, 10:30, or 11:30 IV

EDUCATION 200. History of Education. A comprehensive survey of the development of educational theory and practice, including the reading of educational classics.

M W F 9:30 IV

EDUCATION 300. Philosophy of Education. The fundamental problems of aim and method in their relation to the problems of philosophy. A study of the relation of the school to the state and to other educational forces within the state, and a discussion of the types of education appropriate to democracy. M W F 10:30 I

EDUCATION 400. Administration and Supervision. An account of the organization of state and city school systems, considering such topics as school finance, local versus centralized control, educational surveys, the selection and rating of teachers, training of teachers in service,

measurement of educational products, supervision of special subjects, and the treatment of defective and subnormal children. American and other school systems will be compared. M W F 11:30 IV

The Department of Education of the State of Texas will grant without further examination, a State first grade teachers' certificate, valid for four years, to students who complete at the Institute a year's work consisting of one course in Education and four other courses. A person who has received one State first grade teachers' certificate valid for four years based upon four full college courses and one full course in the department of education may receive another such certificate by offering one additional course in education and four other courses, no one of which was offered for the first certificate. Applications for such certificates may be made at any time following the completion of the necessary work; the certificates expire on the fourth anniversary of the thirty-first day of August of the calendar year in which they are issued.

The Department of Education of the State of Texas will grant without further examinations a State permanent teachers' certificate to persons holding the B.A. degree from the Rice Institute who have completed four of its courses in education and also to persons holding the B.A. degree from the Rice Institute who have taught three full years of not less than six months each in the schools of Texas. The three years' teaching experience may be secured prior to, during the time of, or after the completion of the college work leading to the B.A. degree.

History 100. European History. A general survey of the intellectual, social, and political development of Eu-

rope from the fourth century through the nineteenth. Lectures and required reading.

M W F 8:30 or 9:30 VI

HISTORY 200. Constitutional Government. The origins and operation of constitutional government, the formulation of public policy and the conduct of public business, with special reference to England and the United States. M W F 10:30 VI

HISTORY 300. The Historical Development of the United States, with special reference to the period since the adoption of the Constitution. T Th S 10:30 VI

HISTORY 500. The interpretation of the Constitution by the courts. An advanced seminar course.

PHILOSOPHY 201–2. Logic. A study of the process of thinking and the nature of truth. The first part of the course is devoted to the elements and laws of deductive and inductive reasoning, from which the student advances to the consideration of such problems as the nature of thought, the characteristics and types of judgment, and the unification of knowledge. Considerable time is spent in the critical analysis of arguments with a view to developing the student's power of detecting fallacies, of clear consistent thinking, and of efficient argumentation.

T Th S 10:30 VIII

PHILOSOPHY 203. Problems of Philosophy. A brief elementary discussion of the problems, significance, and value of philosophy; the part it has played in the development of human thought, and its importance in the attainment of true culture. This course follows Philosophy 201–2, and taken together with it comprises a year's credit in philosophy. T Th S 10:30 VIII

PHILOSOPHY 300. History of Philosophy. An historical survey of the essential features and main currents of philosophic thought, ancient, medieval, and modern. The bearing of philosophy on the trend and development of science, art, morality, and religion is emphasized throughout the course. Not offered in 1917–18.

PHILOSOPHY 310. Ethics. An account of the origin and development of moral ideals, the essentials of the main ethical theories, and the problem of morality, individual and social, at the present time. A direct study will be made each year of at least one masterpiece of ethical theory. T Th S 9:30 V

PHILOSOPHY 400. Types of Philosophical Theory. This course is intended to acquaint the student somewhat more intimately with the several distinctively philosophical problems and with the main types of philosophical theory, through lectures and discussions, and more especially through a direct study of some selected masterpieces of ancient and modern philosophy. The works chosen for direct study will vary from year to year.
M W F 9:30 VIII

PHILOSOPHY 410. Philosophy of Religion. An introduction to the historical-philosophical study of religion, designed to acquaint the student with the main facts in the evolution of religion and the part it has played in the history of human culture. The course will begin with an examination of several theories concerning the origin of religion and a brief survey of religious worship in primitive life; will proceed to an elementary study of the great historic religions and of their sacred books; and will end in a consideration of the more fundamental problems of the religious consciousness. Attention will be

paid to the relation of religion to magic, mythology, theology, art, morality, science, and philosophy. Lectures, assigned readings, discussions. Not offered in 1917–18.

PHILOSOPHY 500. Philosophy Seminar.

PHYSICAL TRAINING

IN the arrangements for required physical training, students will be given every opportunity to allow the competitive and purely recreational elements to enter into this work, which will be more properly athletic than gymnastic in character. The classes will be organized in such divisions as to eliminate the possibility of the weaker student being compelled to compete with the stronger. So far as may be possible, each student will be allowed to choose his own recreation, but he will be expected to vary his schedule during the year. The classes will take up boxing, wrestling, athletic dancing, shadow boxing, basketball, soccer football, indoor and outdoor baseball, track work, and the like. Each student will be subjected to two thorough physical examinations, one at the beginning and one at the end of the year. These examinations will determine in large measure the character of work that the individual student will be permitted to take. Lectures will be given on personal hygiene and the general principles of health.

This programme in physical training, which has been effective in previous years, will of necessity be modified during the coming year to conform with the new provisions for military training at the Institute.

COURSES IN MILITARY SCIENCE AND TACTICS

Application has been made to the War Department for the establishment of one or more units of the Reserve Officers' Training Corps at the Rice Institute under the National Defense Act of June 3rd, 1916. The first step towards the establishment of such a unit was made by the War Department on May 12, 1917, by the detailing of Major Joseph Frazier, United States Army, Retired, as professor of military science and tactics at this institution for the next four years. Major Frazier reported promptly for duty and effected a military organization of the students. During the coming year the standard courses of the War Department as outlined in General Orders No. 49 will be offered at the Institute. These courses cover four years of theory and practice in military science and tactics. They will be required of all students, in addition to their regular academic schedules, and without regard to class standing; however, applications for exemption will be considered. Appropriate modification of these standard courses including physical training, hygiene, and first aid to the injured will be required of all the women students in addition to their regular academic schedules. The classes for the women will meet three times a week and those for the men five times a week. Uniforms will be worn by all students. Specifications concerning these uniforms will be issued in a circular letter, copies of which may be had on request. It thus appears that as far as may be consistent with the university programme of the

Rice Institute, the conduct of the life of the place, including that of the campus and the residential halls, will be under military regulations, certainly as long as the war continues.

MILITARY SCIENCE AND TACTICS 100. A. 1. Practical. Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include the School of the Soldier, Squad and Company, close and extended order. Preliminary instruction sighting position and aiming drills, gallery practice, nomenclature and care of rifle and equipment. 2. Theoretical. Theory of target practice, individual and collective (use of landscape targets made up by U. S. Military Disciplinary Barracks, Fort Leavenworth, Kansas); military organization (Tables of Organization); map reading; service of security; personal hygiene. B. 1. Practical. Physical drill (Manual of Physical Training—Koehler); Infantry drill (U. S. Infantry Drill Regulations), to include School of Battalion, special attention devoted to fire direction and control; ceremonies; manuals (Part V, Infantry Drill Regulations); bayonet combat; intrenchments (584–595, Infantry Drill Regulations); first-aid instruction; range and gallery practice. 2. Theoretical. Lectures, general military policy as shown by military history of United States and military obligations of citizenship; service of information; combat (to be illustrated by small tactical exercises); United States Infantry Drill Regulations, to include School of Company; camp sanitation for small commands.

M W F 7:30 T Th 4:40

MILITARY SCIENCE AND TACTICS 200. A. 1. Practical. The same as Course 100. B. 1; combat and collective firing. 2. Theoretical. United States Infantry Drill Regulations, to include School of Battalion and Combat (350–622); Small-arms Firing Regulations; lectures as in Course 100. B. 2.; map reading; camp sanitation and camping expedients. B. 1. Practical. The same as Course 100. B. 1; signaling; semaphore and flag; first aid. Work with sand table by constructing to scale intrenchments, field works, obstacles, bridges, etc. Comparison of ground forms (constructed to scale) with terrain as represented on map; range practice. 2. Theoretical. Lectures, military history (recent); service of information and security (illustrated by small tactical problems in patrolling, advance guards, rear guards, flank guards, trench and mine warfare, orders, messages, and camping expedients); marches and camps (Field Service Regulations and Infantry Drill Regulations).

M W F 7:30 T Th 4:40

MILITARY SCIENCE AND TACTICS 300. A. 1. Practical. Duties consistent with rank as cadet officers or noncommissioned officers in connection with the practical work and exercises laid down for the unit or units. Military sketching. 2. Theoretical. Minor tactics; field orders (studies in minor tactics, United States School of the Line); map manœuvers. Company administration, general principles (papers and returns). Military history. B. 1. Practical. Same as Course 300. A. 1. Military sketching. 2. Theoretical. Minor tactics (continued); map manœuvers. Elements of international law. Property accountability; method of obtaining supplies and equipment (Army Regulations).

M W F 7:30 T Th 4:40

PRELIMINARY ANNOUNCEMENT

MILITARY SCIENCE AND TACTICS 400. A. 1. Practical. Duties consistent with rank as cadet officers or non-commissioned officers in connection with the practical work and exercises scheduled for the unit or units. Military sketching. 2. Theoretical. Tactical problems, small forces, all arms combined; map manœuvers; court-martial proceedings (Manual for Courts-martial). International relations of America from discovery to present day; gradual growth of principles of international law embodied in American diplomacy, legislation, and treaties. Lectures: Psychology of war and kindred subjects. General principles of strategy only, planned to show the intimate relationship between the statesman and the soldier (not to exceed five lectures). B. 1. Practical. Same as Course 400. A. 1. 2. Theoretical. Tactical problems (continued); map manœuvers. Rifle in war. Lectures on military history and policy.

M W F 7:30 T Th 4:40

COURSES IN ENGINEERING

COURSES will be offered in chemical, civil, electrical, and mechanical engineering. A complete course in any one of these branches will extend over five years. A student who has successfully completed the first four years of a course will be awarded a bachelor's degree, and after successfully completing the remaining year of his course he will be awarded a master's degree. The work of the first three years will be practically the same for all students, but in the last two years each student will be required to select one of the special branches mentioned above.

The work of the first two years will consist chiefly of courses in pure and applied mathematics, physics, chemistry, and other subjects, an adequate knowledge of which is absolutely necessary before the more technical courses can be pursued with advantage. During the first two years, however, a considerable amount of time will be devoted to engineering drawing and the elements of surveying.

Technical work will begin in the third year with courses of a general character in mechanical engineering, civil engineering, and electrical engineering, all three of these branches to be taken by all engineering students, with a slight change in schedule for those in chemical engineering. These courses will form an introduction to the technical side of each branch and should enable students intelligently to select a particular branch at the beginning of their fourth year.

In the third year instruction will also be begun in shopwork. The classes in shopwork are intended to give familiarity with workshop methods. The object of these classes is not primarily to train students to become skilled mechanics, but to provide such knowledge of shop methods as is desirable for those who may be expected as engineers to employ mechanics and to superintend engineering shops. It is intended in the engineering courses to pay special attention to the theoretical side, because experience has shown that theoretical knowledge is difficult to obtain after leaving the university, and without it a rapid rise in the profession of engineering is almost impossible. On the other hand, it is not intended to disre-

gard practical instruction; for this reason the last three years will include besides shopwork a variety of practical work in engineering testing laboratories. It is recommended that students obtain employment in engineering work during the summer vacations, for it should be remembered that no amount of university work can take the place of practical experience in engineering establishments and in the field. The courses in engineering are not intended to take the place of learning by practical experience, but are designed to supply a knowledge of the fundamental principles and scientific methods on which the practice of engineering is based and without which it is difficult, if not impossible, to succeed in the practice of the profession.

Students who can afford the time are recommended to devote three or four years to preliminary work instead of two, taking the B.A. at the end of four years and an engineering degree at the end of six or seven years. Students proposing to do this are advised to take a course devoted largely to mathematics, physics, and chemistry, or an honors course in either mathematics, physics, or chemistry. The subjects taken during the years of preparatory work must include those of the first two years in the general engineering course, which may be substituted for options in the academic B.A. course. The honors course in physics is strongly recommended for those who wish to become either electrical or mechanical engineers.

The following are the schedules for the five-year course leading to a bachelor's degree in four years and an engineering degree in five years:

First Year

(1) Mathematics
(2) Physics
(3) English
(4) French or German[1]
(5) Engineering Drawing and Surveying

Second Year

(1) Mathematics
(2) Mechanics[1]
(3) Physics
(4) Chemistry
(5) Engineering Drawing[2]

Third Year

MECHANICAL ENGINEERING AND ELECTRICAL ENGINEERING

(1) Mathematics 300
(2) Mechanical Engineering 300
(3) Electrical Engineering 300
(4) Civil Engineering 300
(5) Mechanical Engineering 310

CIVIL ENGINEERING

(1) Mathematics 300
(2) Mechanical Engineering 300

[1] Chemical engineers take Chemistry.
[2] Chemical engineers take French or German.

(3) Electrical Engineering 300
(4) Civil Engineering 300
(5) Civil Engineering 310

CHEMICAL ENGINEERING

(1) Chemistry 300
(2) Chemistry 310
(3) Chemistry 320
(4) Physics 200
(5) Electrical Engineering 300
(6) Civil Engineering 300

Fourth Year

MECHANICAL ENGINEERING

(1) Mechanical Engineering Laboratory (M.E. 400)
(2) Machine Designs (M.E. 410)
(3) Heat Engines (M.E. 420)
(4) Industrial Management (M.E. 430)
(5) Gas Engines and Producers (M.E. 440)
(6) Economics 200
(7) Seminar (Eng. 400)

ELECTRICAL ENGINEERING

(1) Alternating Currents (E.E. 400)
(2) Electrical Engineering Laboratory (E.E. 410)
(3) Electrical Design (E.E. 420)
(4) Industrial Management (M.E. 430)
(5) Economics 200
(6) Seminar (Eng. 400)

CIVIL ENGINEERING

(1) Graphic Statics and Masonry (C.E. 400)
(2) Roofs and Bridges (C.E. 410)
(3) Municipal Engineering (C.E. 420)
(4) Chemistry 200
(5) Economics 200
(6) Seminar (Eng. 400)

CHEMICAL ENGINEERING

(1) Applied Electrochemistry (Chem. 420)
(2) Chemistry (Elective)
(3) Economics 200
(4) Seminar (Eng. 400)
(5) Seminar (Chem. 480)
(6) Mechanical Engineering 300

Fifth Year

MECHANICAL ENGINEERING

(1) Advanced Machine Design (M.E. 500)
(2) Mechanical Processes (M.E. 510)
(3) Power Plant Design (M.E. 520)
(4) Thesis (M.E. 530)
(5) Heating, Ventilation, and Refrigeration (M.E. 540); or Turbine and Boiler Design (M.E. 550)
(6) Chemistry 200

PRELIMINARY ANNOUNCEMENT

ELECTRICAL ENGINEERING

(1) Advanced Alternating Currents (E.E. 500)
(2) Thesis (E.E. 510)
(3) Heat Engines (M.E. 420)
(4) Seminar (Eng. 400)
(5) Elective

CIVIL ENGINEERING

(1) Structural Design (C.E. 500)
(2) Hydraulic Design (C.E. 510)
(3) Sanitary Engineering (C.E. 520)
(4) Thesis (C.E. 530)
(5) Technical Analysis (Chem. 320)

CHEMICAL ENGINEERING

(1) Chemistry Research (Chem. 500)
(2) Two courses in chemistry
(3) One course in engineering
(4) Seminar (Chem. 480)
(5) Seminar (Eng. 400)

ENGINEERING 100. This course embraces Mechanical Drawing and Plane Surveying. Mechanical Drawing: The use of instruments, lettering; drawing figures in isometric, cabinet, and orthographic projection; intersections and developments. Plane Surveying: The study of the uses and adjustments of surveying instruments. Prob-

lems are given in field work to familiarize the student with the chain, compass, level, and transit. Plotting and compilations from field notes.

M 10:30 W Th 1:30–4:30 S 10:30–12:30
or T 11:30 M T F 1:30–4:30 VIII

Engineering 200. This course embraces Descriptive Geometry, Kinematics, and Engineering Drawing. Descriptive Geometry: Orthographic projection of points, lines, planes, warped surfaces, etc., in the four angles of projection; intersections and developments. Kinematics: The study of relative motion of parts of machines, instant centers, velocities, gearing and wrapping connectors. Engineering Drawing: Lettering; plotting field notes; working drawings and tracings of structural details, etc.

W F 8:30 and T Th 9:30–12:30 VIII

Mechanical Engineering 300. Prime Movers. A general course dealing with the characteristics, fields of usefulness, operation, and test of fuels, engines and turbines, boilers, pumps, condensers, and auxiliaries; properties of steam; valve gears. Laboratory and text work are coördinated as nearly as possible, and numerous problems illustrate the theory discussed. Two recitations and one three-hour laboratory period a week throughout the year. Prerequisites: Physics and Chemistry 100.

M W 10:30 T 1:30–4:30 IV

Mechanical Engineering 310. Machine Shop. Through text-book and lectures dealing with general shop practice and machine design, the course aims to produce men with a general knowledge of engineering shopwork, such as foremen and managers require. Practice with a variety of bench and machine tools, carefully selected for their fitness in illustrating the principles studied, affords

actual contact with machine work and develops a certain degree of skill and resourcefulness in the student. Three periods a week throughout the year.

M W 1:30–4:30 S 9:30–12:30 X

ELECTRICAL ENGINEERING 300. The fundamental principles of dynamo machinery, both direct and alternating current. The course includes laboratory work, which as far as possible parallels the class-room work. Two recitations and one laboratory period per week throughout the year.

T Th 8:30 Th 1:30–4:30 VI

CIVIL ENGINEERING 300. Strength and resistance of materials. Analysis of stresses in beams, columns, and shafts. Hydraulics. The principles of hydromechanics. The laws of pressure and flow of water. Laboratory work including tensile, compressive, torsional, and transverse tests of materials. Three recitations and one laboratory period per week throughout the year.

M W F 11:30 T 9:30–12:30
or Th 9:30–12:30 IX

CIVIL ENGINEERING 310. Topographic, Railroad, and Geodetic Surveying. The theory and practice of stadia surveying; contour maps; topographic symbols. Triangulation and base-line measurements. Quadrilateral adjustments. The mathematics of simple, compound, parabolic, and spiral easement curves. Computation of earth work and estimate of cost. Reconnaissance, preliminary, and location surveys by methods used in actual practice. Three recitations or practical periods throughout the year. M W F 1:30–4:30 VIII

MECHANICAL ENGINEERING 400. Mechanical Engineering Laboratory. An advanced course in general steam, oil, water, and power-transmission machinery operation and testing. Prerequisite: Mechanical Engineering 300. Two laboratory periods a week throughout the year. T Th 8:30–11:30 IV

MECHANICAL ENGINEERING 410. Machine Design. Calculations and drafting, supplemented by text-book and reference work, involved in the design of machine parts, considering both the theory and its modifications due to shop practice and financial limitations. Prerequisite: Engineering 100 and 200, Mechanical Engineering 310, and Engineering 330 (Mechanics of Materials). Three drafting periods a week throughout the year.
T Th F 1:30–4:30 II

MECHANICAL ENGINEERING 420. Heat Engines. General thermodynamics; applications of thermodynamics to the design and operation of steam engines and turbines, air and ammonia compressors, gas engines, and injectors; commercial forms of these machines. Prerequisite: Mathematics 200 and M.E. 300. Three recitations a week throughout the year. M W F 8:30 V

MECHANICAL ENGINEERING 430. Industrial Management. A study of principles and practice in the management of manufacturing plants; location and layout of works; organization of administration, sales, cost, and production departments; selection of machinery, material, and labor; wage systems; cost analysis; welfare work and efficiency methods. Two recitations a week throughout the year. M W 11:30 VIII

MECHANICAL ENGINEERING 440. Gas Engines and Producers. A study of the theory, design, and operation of internal combustion engines and gas-producers. Must be preceded or accompanied by M.E. 420. Three periods a week throughout the year. M W F 9:30 X

ELECTRICAL ENGINEERING 400. Alternating Currents. A mathematical treatment of the theory of alternating current phenomena, using Steinmetz's symbolic method. The various types of alternating current generators and motors; their characteristics and operation. Transformers. Synchronous converters. Four recitations per week throughout the year. M T Th S 9:30 VI

ELECTRICAL ENGINEERING 410. Electrical Engineering Laboratory. A laboratory study of alternating current circuits, instruments, and machines. Standard testing of direct and alternating current machinery. Two laboratory periods per week throughout the year.
W F 1:30–4:30 II

ELECTRICAL ENGINEERING 420. Electrical Design. Design of machinery for direct and alternating current. Calculation of characteristics. Two drawing periods per week throughout the year. W F 8:30–11:30 III

CIVIL ENGINEERING 400. Graphic Statics. Design of roof trusses. Masonry. Properties and uses of building stone, brick, concrete, sand, gravel, broken stone, cement, lime, etc. Foundations of various kinds under different geological conditions. Design of masonry structures and foundations. Three design periods or recitations a week throughout the year.
T 1:30–4:30 Th 8:30–11:30 S 8:30–10:30 II

CIVIL ENGINEERING 410. Roofs and Bridges. Computation of stresses in roof and bridge trusses; highway and railway bridges; deflection and internal work; continuous, draw, cantilever, and suspension bridges. Structural design involving the principles enumerated above. Three periods a week throughout the year and design periods. M W F 9:30 Th 1:30–4:30 III

CIVIL ENGINEERING 420. Municipal Engineering. This course is divided into three equal parts. Water supply engineering: a study of rainfall, evaporation, seepage, and run-off. Probability of droughts. Computations for storage. Design, construction, operation, and maintenance of filtration plants. Distribution systems for municipal and irrigation purposes. Roads and pavements: Construction and maintenance of earth, macadam, and bituminous macadam roads, asphalt, brick, wood block and granite block pavements. Sewerage and sewage disposal: Water-carriage system, separate and combined. Design, construction, and maintenance of sewers and sewage disposal plants. M W F 11:30 VII

ENGINEERING 400. Seminar. A weekly meeting conducted by the fourth year engineering students for the discussion of current topics from the technical periodicals, and of scientific and technical papers of general engineering interest. One meeting a week throughout the year. S 10:30

MECHANICAL ENGINEERING 500. Advance Machine Design. The investigation of elaborate complete machines; original design of complete machines; design of mill-building trusses, floors, and structural details.

MECHANICAL ENGINEERING 510. Mechanical Processes. A general course dealing with special plants and processes, such as the manufacture of cement, metallurgy, water-softening, etc., not covered by other special courses.

MECHANICAL ENGINEERING 520. Power Plant Design. A general text and design course covering details of operation and design of power and heating plants.

MECHANICAL ENGINEERING 530. Thesis. The investigation, under the supervision of the Mechanical Engineering staff, of some undeveloped engineering problem, either through experiment, design, or compilation of available information.

MECHANICAL ENGINEERING 540. Heating, Ventilating, and Refrigeration. Text-book, lectures, and problems on the heating and ventilating of public and private buildings and the manufacture of ice and maintenance of low temperatures. Elective. Must be preceded by Mechanical Engineering 420.

MECHANICAL ENGINEERING 550. Turbine and Boiler Design. Text-book, lectures, and drafting practice relating to the design of standard forms of steam turbines and boilers. Elective. Prerequisite: Mechanical Engineering 420.

ELECTRICAL ENGINEERING 500. A continuation of Electrical Engineering 400. Advanced alternating currents. Transients. Attention will be given to special branches such as high voltage installations, high frequency, illumination, telephony, wireless telegraphy, etc. Three lectures and one laboratory period per week.

ELECTRICAL ENGINEERING 510. Thesis. A thorough report on an engineering investigation selected and carried out by the individual student. It is expected that a great deal of time will be given to thesis work. The course is considered the equivalent of a three-hour course.

CIVIL ENGINEERING 500. Structural Design. Principles of economic design. Class-room designs of plate girders, pin connected and riveted bridges. Steel frame and reinforced concrete building construction. Three design periods a week throughout the year.

CIVIL ENGINEERING 510. Hydraulic Design. Design of dams, conduits, penstocks, and turbines; irrigation and drainage systems; sewers and sewage disposal plants; water-supply systems and water-power plants. Three design periods a week throughout the year.

CIVIL ENGINEERING 520. Advanced sanitary engineering. This course will consist of a detailed study of all phases of sanitary engineering, including, besides water supply engineering and sewerage, problems in garbage disposal, ventilation, street cleaning, etc. Laboratory work in water, sewage and other analyses will be given in connection with the course. Prerequisite: Civil Engineering 420 or its equivalent.

CIVIL ENGINEERING 530. Thesis. This will consist of an original investigation along some approved line of civil engineering work, an original design, or a critical review of existing work. In every case a complete type-written or printed report will be required, and this will become the property of the Institute and be deposited in the general or departmental library.

PRELIMINARY ANNOUNCEMENT

COURSES IN ARCHITECTURE

To students of architecture the Institute offers a full course extending over five years, leading to a bachelor's degree at the end of the fourth year and to an architectural degree at the end of the fifth year. It is the purpose of the course in architecture to lead students during their residence to a comprehensive understanding of the art of building; to acquaint them with the history of architecture from early civilization to the present age; and to develop within them an understanding and appreciation of those conceptions of beauty and utility which are fundamental to the cultivation of ability in the art of design.

In arranging the courses which follow it will be observed that there are included certain indispensable elements of a liberal education and also such engineering and technical subjects as are becoming more and more necessary to the general education of a practising architect. Of the more strictly architectural subjects, design is given by far the largest place. As a matter of fact, the courses in history and design and those in freehand drawing, in water color, in drawing from life, and in historic ornament have all a double object: to create in the student an appreciation of architectural dignity and refinement and to increase constantly his ability to express conception of architectural forms. Accordingly, the training of the student is not limited to the training in draftsmanship alone, but all courses conspire to the cultivation of creative and constructive ability in expression and design. With

a view to keeping the student in touch with the progress of his profession and with the daily routine and detail of its practice, it is strongly recommended that he spend a portion of each of his summer vacations in the office of some practising architect.

The following are the schedules for the five-year course leading to a bachelor's degree in four years and a degree in architecture in five years:

First Year

(1) Pure Mathematics
(2) English
(3) A modern language (French recommended)
(4) Physics
(5) Architectural subjects: architectural drawing, elements of architecture, freehand drawing, and shades, shadows, and perspective

Second Year

(1) Pure Mathematics
(2) English
(3) A modern language[1]
(4) A science
(5) Architectural subjects: design, antique drawing, history of architecture

[1] Students who enter with credits in two modern languages may substitute another subject.

Third Year

(1) English

(2) History or Economics

(3) Architectural subjects: design, antique drawing, water-color drawing, history of architecture, pen and ink rendering

Fourth Year

(1) English or History

(2) Architectural subjects: design, construction, water color drawing, pen and ink rendering, drawing from life, history of architecture, historic ornament, special lectures, materials

Fifth Year

Architectural subjects: design, construction, water color drawing, drawing from life, history of painting, architectural practice, special lectures

ARCHITECTURE 100. Elementary training in drawing of order plates, wash drawings, lettering, shades and shadows, and perspective. Six hours a week.

M F 1:30–4:30 VIII

FREEHAND DRAWING 100. Elementary drawing in pencil and charcoal of single simple objects and block groups and casts. Four hours a week.

T S 10:30–12:30 XII

ARCHITECTURAL DESIGN 200. Rendered drawings embracing the design of simple elements of buildings, together with advanced work in the use of the orders and in composition. Eight hours a week.

T Th 1:30–4:30 W F 3:30–4:30

FREEHAND 200. Drawing in charcoal from simple casts of classical ornament. Four hours a week.

T Th 10:30–12:30 XII

HISTORY OF ARCHITECTURE 200. Two lectures a week on the history of ancient architecture, illustrated by lantern slides, and two hours a week of research and tracing of historic buildings. Four hours a week.

W F 1:30–3:30 IV

ARCHITECTURAL DESIGN 300. The design of small buildings. The problems average five weeks in duration with twenty-four hours for the sketch problems at the end of the major problems. Nine hours a week.

M W F 1:30–4:30

FREEHAND 300. Drawing from casts of antique sculpture. Four hours a week. M F 8:30–10:30 X

WATER COLOR 300. Elementary training in color drawing and simple groups of still life. Two hours a week. W 8:30–10:30

HISTORY OF ARCHITECTURE 300. Two lectures a week in the history of medieval architecture, illustrated by lantern slides, and two hours a week of research in the study of historic buildings. Four hours a week.

T Th 1:30–3:30 IV

DESIGN 400. The design of public buildings and groups of buildings. The problems average six weeks in duration, alternating with twelve-hour sketch problems. Twelve hours a week.

M 1:30–5:30 T W Th F 3:30–5:30

HISTORIC ORNAMENT 400. The study of the history of ornament, with a series of design plates in ornament from historic periods of architecture. Six hours a week.

T Th S 8:30–10:30 VI

CONSTRUCTION 400. Two lectures a week on masonry construction, with one plate a week. This course alternates with Construction 500 in successive years.

T Th 2:30–3:30 V

HISTORY OF ARCHITECTURE 400. Two lectures a week on the history of modern architecture, illustrated by lantern slides, together with appropriate problems in design.

W F 2:30–3:30 I

FREEHAND 400. Drawing from casts of full figure and group, antique sculpture. Four hours a week.

M F 9:30–11:30 X

WATER COLOR 400. Water color drawing and sketching in color, work advanced, subjects varied. Two hours a week. W 9:30–11:30

DESIGN 500. Thesis design. The problem for a thesis may consist of a single building or group of buildings, and must include large scale studies as well as general drawings. The student may select his own problem, but his entire programme is subject to the approval of the instructors in design. Sixteen hours a week.

T Th S 8:30–12:30 M F 1:30–3:30

History of Painting 500. One lecture a week on the history of painting, together with two hours in the library under the direction of the instructor.

W 1:30–4:30 IV

Construction 500. Two lectures a week on carpentry construction and roof trusses, with one construction plate a week. This course alternates with Construction 400 in successive years. T Th 2:30–3:30 V

Life Drawing 500. Drawing and sketching from the draped figure. Four hours. M W 10:30–12:30

Water Color 500. Rendered architectural details and measured drawings in color. Two hours.

F 10:30–12:30

Special Lectures 400 and 500. Lectures on the professional practice of architecture, including the business relations of architect with client and contractor. One lecture a week. T 3:30–4:30

UNIVERSITY EXTENSION LECTURES

To bring the people of the city and community into more intimate touch with the academic life of the university, and to carry the influence of that life directly to many homes not represented on the rolls of its undergraduate or postgraduate students, regular series of public lectures, in the form of university extension lectures, are offered without matriculation fee or other form of admission requirement. These performances are authoritative in character, but as non-technical and popular in treatment

as their subjects will permit. From domains of literature, history, science, art, philosophy, and politics subjects of current interest as well as those of assured and permanent value are chosen. The present plan for these university extension lectures consists in giving each academic year two regular series of thirty-six lectures each on Mondays, Wednesdays, and Fridays, from the middle of November to the middle of February, the second series running similarly from the middle of February to the middle of May. All these lectures are delivered in the lecture halls and amphitheaters of the Institute, each afternoon lecture beginning promptly at 4:30 and closing not later than 5:30. In addition to the afternoon lectures, occasional Thursday evening lectures are given.

RICE INSTITUTE PUBLICATIONS

Among the publications of the Rice Institute are at present included the Announcements, the Descriptive Brochure, the Programmes of University Extension Lectures, and the Rice Institute Pamphlets. The first three of these have appeared at intervals and in several editions; the Pamphlet, now in its third volume, is published quarterly in January, April, July and October, with a view to giving wider publicity in permanent form to inaugural and other lectures in letters, science, and art by visiting lecturers and professors to the University. In this connection the reader may wish to turn to the paragraph of this Announcement concerning the formal opening of the Institute.

LIBRARY

QUARTERS for the Library of the Institute have been provided on the second floor of the Administration Building. In its initial equipment the policy is being followed of supplying such books as are necessary to supplement the courses of instruction and to support the independent investigations of the staff and advanced students. In this manner a high degree of efficiency becomes possible at the very beginning of the Library's existence. Moreover, for works of general and more popular interest the shelves of the Carnegie Library of Houston are accessible to all members of the Institute.

Besides several hundred current literary and scientific journals, the Library of the Institute contains at present back files of a number of periodicals; among these may be mentioned, exclusive of certain government publications, the following: Acta Mathematica, American Historical Review, American Journal of International Law, American Journal of Mathematics, American Machinist, American Political Science Review, Annalen der Physik, Annales de la Société Royale des Sciences Médicales et Naturelles de Bruxelles, Annual Reports of the American Historical Association, Architectural Record, Archiv für Entwickelungsmechanik der Organismen, Archiv für Zellforschung, Arts and Decoration, Berichte der Deutschen Chemischen Gesellschaft, Berichte der Deutschen Physikalischen Gesellschaft, Bulletin of the American Mathematical Society, Chemical Abstracts, Chemical News, Contributions from the Jefferson Physical Laboratory of

Harvard University, Educational Administration and Supervision, Electric Journal, Electrician, Engineering Index Annual, Engineering News, Engineering Record, L'Enseignement Mathématique, Ergebnisse der Anatomie und Entwickelungsgeschichte, Handbuch der Vergleichenden Physiologie, Hibbert Journal, International Journal of Ethics, International Studio, Jahrbuch der Radioaktivität und Elektronik, Jahrbuch der Drahtlosen Telegraphie und Telephonie, Jahrbuch über die Fortschritte der Mathematik, Journal de Mathématiques, Journal de Physique, Journal of Animal Behavior, Journal of Industrial and Engineering Chemistry, Journal of Parasitology, Journal of Philosophy, Psychology, and Scientific Methods, Journal of Physical Chemistry, Journal of Speculative Philosophy, Journal of the American Chemical Society, Journal of the Chemical Society (London), Journal of the Institution of Electrical Engineers, Journal of the Society of Chemical Engineers, Larousse Mensuel, La Lumière Électrique (and L'Éclairage Électrique), Mathematische Annalen, Metallurgical and Chemical Engineering, Mind, Monist, National Electric Light Association Bulletin, National Municipal Review, National Society for the Study of Education—Yearbooks, New Republic, Philosophical Review, Physical Review, Physikalische Zeitschrift, Power, Print Collectors' Quarterly, Proceedings of the London Mathematical Society, Proceedings of the Royal Society of London—Series A and B, Proceedings of the Society for the Promotion of Engineering Education, Publications of the Carnegie Institution of Washington, Quarterly Journal of Mathematics, Quarterly Journal of Microscopical Sci-

ence, Rendiconti del Circolo Matematico di Palermo, Revue Philosophique de la France et de l'Étranger, Revue Semestrielle des Publications Mathématiques, School and Society, Science Abstracts—Series A and B, Social Hygiene, Southwestern Historical Quarterly, Transactions of the American Electrochemical Society, Transactions of the American Institute of Chemical Engineers, Transactions of the American Institute of Electrical Engineers, Transactions of the American Mathematical Society, Transactions of the American Society of Civil Engineers, Transactions of the American Society of Mechanical Engineers, United States Supreme Court Reports, Zeitschrift für Analytische Chemie, Zeitschrift für Angewandte Chemie, Zeitschrift für Anorganische Chemie, Zeitschrift für Elektrochemie, Zoologischer Anzeiger, Zoologische Jahresberichte.

LABORATORY INSTALLATION

THE physics laboratories are located on the north side of the academic court, adjoining the administration building, and are connected with the latter by a continuation of the original cloister. The buildings are constructed of brick and marble, corresponding in design to the style as defined in the administration building, but of a simpler character expressing their purpose as laboratories. The physics laboratory proper is a two-story building 275×56 feet, connected with a large lecture amphitheater 121×72 feet. The main building contains four large students' laboratories, two lecture rooms equipped for giving illustrated

lectures, two class rooms, two dark rooms, a library, and administrative offices. The principal room of the amphitheater wing is a large lecture hall with seating capacity for about four hundred auditors. The room is fully equipped for giving illustrated lectures and is arranged with seats properly elevated to command a 28-foot lecture table which is supplied with gas, hot and cold water, compressed air, vacuum, and direct and alternating electric currents. In this wing also are six rooms fitted for research work in physics, a battery room in which a battery of 60 Edison storage cells of 300 ampere-hours' capacity has been installed with space provided for another equal battery, a switchboard room where the wires from the battery can be connected in any desired manner for use in the laboratories, a motor generator for charging the batteries, a vacuum pump, a liquid air plant, constant temperature rooms, a preparation room, a large dark room, and a fully equipped workshop. The floor of the workshop is supported free from contact with the surrounding walls so that vibration from the machines does not affect the building. Elevators for moving heavy apparatus are provided, and all laboratories, lecture rooms, and research rooms are equipped with individual service, for the students, of gas, water, steam, compressed air, vacuum, and both direct and alternating currents of electricity. The laboratory now contains a fine collection of modern apparatus suitable for teaching and research work in all branches of physics. This collection includes about seventy ammeters and voltmeters of all types, including a Kelvin gauge reading up to 30,000 volts and standard Weston instruments. About thirty resistance boxes of all

kinds are also provided, and numerous galvanometers, including a Paschen instrument. High potential batteries are available for research work. A large Weiss electromagnet and a Leeds and Northrup potentiometer may be specially mentioned among the other electrical instruments. The optical instruments include a Hilger's wave length spectrometer, monochromatic illuminator, spectrophotometer, and quartz spectrograph; also a set of interferometers of various types. For work in heat, electrical furnaces, various types of radiation pyrometers, resistance thermometers, and standard thermocouples are available. The apparatus for general work includes several Gaede pumps and a molecular pump; also standards of weight, length, etc. The collection of apparatus for illustrating lectures is exceptionally complete.

The department of chemistry is for the present housed in the mechanical laboratory and in an annex adjoining the same. It contains three large laboratories with locker space for three hundred and fifty students; two lecture rooms; four research rooms; a department library room; a spacious stock room, offices, apparatus rooms. The department is splendidly equipped with modern apparatus and materials for research and for lecture room and laboratory work in inorganic, organic, analytical, physical, electro-, and industrial chemistry. Each laboratory room is equipped with the necessary conveniences, such as water, gas, alternating and direct current, air blast, hoods, suction pumps, etc. The lecture rooms are suitably arranged for the illustration of lectures by experiment and lantern projection. In the department library will be found the more important journals, works of reference,

and standard textbooks on the different branches of chemistry. These books and periodicals are accessible to all students.

The department of biology is for the present situated in the west end of the main wing of the physics laboratories. It contains a laboratory capable of seating sixty students; a lecture room with lantern for microscopic and other forms of projection; three research rooms, a preparator's room, store rooms, etc. The undergraduate courses are cultural in their aim. Laboratory work is given in all; microscopes of the most modern type are provided for the students. Six binocular microscopes, seven microtomes of various kinds, thermostats, embedding baths, and considerable accessory equipment, including physiological apparatus, are available for research work. Most of the important current zoölogical periodicals are to be found in the library.

The department of architecture is located on the second floor of the mechanical laboratory, and is equipped with a large general drafting room modern in all its appointments, and with a large studio for freehand drawing and water color. A working library of architecture adjoins the drafting room and is equipped with the standard architectural publications; current files of architectural periodicals; plates, photographs, and lantern slides. The freehand studio is well equipped with plaster casts from the antique, and of historic ornament. The department also possesses models for elementary instruction in the orders, and models for the teaching of construction.

The civil engineering laboratory is fully equipped with the usual surveying instruments, having ten transits,

seven levels, four compasses, three traverse tables and one plane-table, all of standard American makes. These include C. L. Berger and Sons, Buff and Buff, W. and L. E. Gurley, Bausch and Lomb, Keuffel and Esser, Eugene Dietzgen and Company, William Ainsworth and Sons and Heller and Brightly. There is also a large assortment of the necessary auxiliary equipment such as tapes, rods, range poles, etc. The drafting room is fully equipped with instruments not required by each individual student, such as planimeters, protractors, special slide rules, railroad curves and irregular curves consisting of splines and weights. The materials testing laboratory of this department is equipped with one 50,000 pound Riehle universal machine; one 20,000 pound machine; and one 60,000 inch-pound Torsion machine of the same make; also a Fairbanks 2000 pound cement testing machine and the necessary auxiliary apparatus for making the usual tests. All these machines except the cement testing machine are operated by 220 volt, 3 phase, 60 cycle motors, directly connected so as to avoid all shafting and belting. It is planned to have a road materials testing laboratory and also a sanitary engineering laboratory for advanced students and research.

The electrical engineering laboratory is a long, high room, well lighted and ventilated by many large windows on the long sides. Those on the south are shaded by a wide cloister. With the almost continuous sweeping of a south breeze through the room, a more pleasant place to work could hardly be imagined. The power supply, arranged to be independent of the general Institute lighting and power system by running from a separate generator

in the power house, is 220 and 110 volts, 3 phase, 60 cycles. Direct current for laboratory use is obtained from a General Electric three wire generator of 35 kilowatt capacity, 125–250 volts, driven from this alternating source by a direct connected induction motor. The distribution of power supply is accomplished by open overhead busses to small switchboards. The circuitbreakers on these distribution boards are of varied make, representing Westinghouse, General Electric, I-T-E, Condit, and Roller-Smith practice. The laboratory equipment is ample for thorough study of both direct and alternating current circuits and machinery. The direct current equipment includes: a 5 kilowatt 110 volt Commercial shunt generator; a 1½ kilowatt 500 volt generator; a 5 kilowatt Weston generator, a 3½ kilowatt Westinghouse generator, and a 4½ kilowatt Westinghouse generator with interpoles, all flat-compound for 110 volts; two similar 5 kilowatt 125 volt General Electric generators with commutating poles, either flat- or over-compound, for parallel operation; a 2 horse-power Roth motor, a 7½ horse-power Weston motor, a 10 horse-power Robbins and Myers motor, and two similar 13 horse-power Crocker-Wheeler motors, all shunt wound for 250 volts; a 3 horse-power 250 volt General Electric variable speed shunt motor with commutating poles, a 4 horse-power Sprague series motor. The equipment of alternating current machinery includes: two similar 7½ kilowatt General Electric 2-3-6-12 phase synchronous generators which may be direct connected as a frequency-changer set or, by means of shifting stators, as a phase-displacement set, or used without mechanical connection for parallel operation; a 5 kilowatt General

Electric 3 phase synchronous generator with distributed field (round rotor); an 8 kilowatt General Electric synchronous converter of the split-pole or regulating-pole type; a 5 horse-power Fairbanks-Morse squirrel cage induction motor; a 5 horse-power Westinghouse slip-ring induction motor; a 10 horse-power General Electric induction motor with internal starting resistance; a 7½ horse-power Wagner unity power-factor single phase motor; three 2 kilovolt-ampere Kuhlman 110/220:110/220 volt transformers; six 3 kilovolt-ampere Weston 110/220; 110/220 volt transformers with taps for Scott and other connections; a 10 kilovolt-ampere General Electric 220 volt 3 phase induction regulator for raising or lowering voltage 100%; reactances, both air and iron core; condensers; rheostats; etc. Loads for testing purposes may be obtained by rheostat, lamp banks, or by three large iron water-boxes. The equipment of meters consists of voltmeters (a.c. and d.c.), ammeters (a.c. and d.c.), wattmeters (single phase and polyphase), current and voltage transformers, power-factor meters, frequency meters, watt-hour meters, tachometers, synchronoscope, etc. Elaborate short circuit tests are being made on a 45 kilovolt-ampere synchronous motor used as generator. The equipment of this test, which is available on occasion for student use, includes a 6 volt direct current generator with Tirrill voltage regulator, capable of delivering 500 amperes, driven by a direct connected induction motor, a solenoid operated oil switch, and an oscillograph completely equipped for taking and developing both rectangular and circular records.

PRELIMINARY ANNOUNCEMENT

The mechanical engineering laboratory equipment falls into three general classes: steam machinery, hydraulic machinery, and apparatus for testing fuels and lubricants. The first class contains an 8×18 Murray-Corliss engine equipped with rope brake; a 7×7 vertical Wachs slide valve engine with Stephenson reversing gear and Prony brake; a $6 \times 4 \times 6$ duplex boiler feed pump; a 20 kilowatt direct current De Laval turbo-generator set, nozzled for condensing and non-condensing operation and fitted with a brake-pulley which may be substituted for the generator; a Westinghouse locomotive type air-compressor; and a $6 \times 10 \times 6$ vertical compound Sturtevant engine. These machines are piped to exhaust either into the power-house stack or into three Wheeler surface condensers served by circulating and wet vacuum pumps. A 15 horse-power Foos oil engine equipped with two types of governors gives opportunity for engine tests using either kerosene or gasoline as fuel. Another type of oil engine is represented by a 3 horse-power Mietz and Weiss two-stroke cycle unit, and a Ford automobile engine with water-brake load is being erected. The hydraulic machinery consists of a 3 inch centrifugal pump, driven by the Wachs engine; a calibrated overhead tank; a concrete storage cistern; two Venturi meters; a single tube manometer; a steam pulsometer; a hydraulic ram; a wier box and notch; a Pelton-Doble water wheel with plate glass sides; orifices, water meters, weighing tanks and scales, gauges, and the usual small accessories. In a separate fuels laboratory room is the equipment for testing fuels and oils. It includes complete Atwater and Parr coal-

calorimeter outfits; analytical balances; a Moyer-Allen flue-gas apparatus; a Scott viscosimeter; a Thurston coefficient of friction machine; hydrometers and specific gravity apparatus; a Junker type gas calorimeter; platinum ware, drying oven, ball mill, etc. In another small room is a 20 horse-power vertical fire-tube boiler with the pumps and weighing equipment necessary for boiler tests.

In addition, the laboratory contains injectors, dead weight pressure gauge tester, thermometer calibration apparatus, hoists, tachometers, steam calorimeters, the most popular gas and steam engine indicators, planimeters, standard gauges and thermometers. For class-room demonstrations, a Cussons valve-setting model, a steam pump model, and a collection of blue-prints and curves are available, and tests of heat-treated steel may be made with the aid of the electric and gas furnaces, electric and optical pyrometers, and scleroscope provided.

The machine shop contains machine tools of quite varied character, each selected for its peculiar fitness to illustrate the principles and common details of modern shop tools and methods. The lathe equipment consists of one 14×18 Le Blond cone-head lathe with taper attachment and double back gears; one 14×6 Hendey cone-head quick-change lathe; one 14×8 standard lathe; one 14×7 Prentice geared head quick-change lathe; one 14×6 geared head quick-change Lodge and Shipley lathe; one 14×6 motor-driven Lodge and Shipley selective head lathe; and one individual drive 14×6 American high duty geared head engine lathe. The planer type of machine is represented by a 16 inch back-geared Rockford shaper

with compound head. All kinds of plane surfaces can also be cut upon the No. 1 Kempsmith universal milling machine, which is fitted with a good variety of cutters and a dividing head for gear cutting, differential indexing, spiral grooving, etc. A No. 12 Brown and Sharp motor-driven cutter and universal grinder serves as a practical example of a high-class precision machine tool. For miscellaneous work, a double-disc Gardner ball-bearing motor-driven disc grinder, a work bench with vises, a two-wheel hand-tool grinder, a power hacksaw, a forge, a 20 inch drill-press, a sensitive drill, and an arbor press are available. A sufficient supply of small hand and machine tools, lathe sets, and precision measuring instruments is issued on checks from a separate tool-room. Most of the machines are driven through a line shaft by a 15 horse-power motor. A supply of compressed air offers opportunity to demonstrate pneumatic tools. The shop is on the ground floor, well lighted and ventilated, with ample provision of lavatories and lockers. The students' work is arranged with the aid of a despatch board and time-recording system, and early in the course standard instruction sheets and tool-lists are issued. Later, the student is thrown on his own resources. During the year inspection trips to local foundries, repair shops, and machinery assembling plants bring the student in touch with special machinery and processes not found at the Institute. Similar trips are also made to power-plants in the neighborhood.

STUDENT ORGANIZATIONS

In the residential halls for men, students and instructors are already living in a common society a common life under conditions the most democratic. They sit at a common table; they lounge in common club-rooms; they frequent the same cloisters; in games they meet again upon the same playing fields. The quadrangle is self-governed, with no other machinery of government than is necessary to conduct a gentleman's club. To the quadrangle, as to the college, the only possible passports are intellect and character. In the quadrangle, as on the campus, the business of life is regulated by no other code than the common understanding by which gentlefolk determine their conduct of life, constantly under the good taste, the good manners, the enduring patience of gentle minds, among strong men who believe that he lives most who works most, labors longest, worries least. The military arrangements now being proposed for the Institute while the national government is waging war may of necessity modify in some details the machinery of government of the residential halls. However, the halls will continue to have their literary and debating societies, religious associations, and musical and athletic organizations. From the very opening days of the new institution the students of the Rice Institute, irrevocably committed to canons of clean sport, have participated in the several forms of intercollegiate athletic contests. Following the organization of the Rice Institute Athletic Association, the first society of students to be organized at the new

University was the Young Men's Christian Association. This step on the part of the young men was speedily followed by a similar step on the part of the young women in the organization of their branch of the college Young Women's Christian Association. The founding of these religious societies, both of which have contributed to the social life and the religious spirit of the new University, was followed promptly by the forming of three literary societies, one by the young women, bearing the name of Elizabeth Baldwin, wife of the founder of the Institute, and two by the young men, known respectively as "The Owl Literary Society" and the "Riceonian Literary and Debating Society." These societies meet weekly, and have held occasional intersociety meetings in public debate. The three literary societies are maintaining at present the first of the undergraduate periodical publications, namely, "The Thresher," which has been appearing fortnightly since its initial number in January, 1916. Previous to the organization of the staff of "The Thresher," the Class of 1916 made arrangements for the publication of the first class annual of the Institute, "The Campanile," which appeared in the spring of 1916. The Class of 1917 is issuing the second volume of "The Campanile," and the Class of 1918 has appointed the staff for the third volume of this annual. In addition to the student organizations mentioned above, various departmental clubs and scientific societies have been contributing to the intellectual life of the Institute.

The extra-curriculum academic and athletic activities of the Rice students have been stimulated by several prizes donated by friends of the Institute: namely, the

Lechenger silver cup, the gift of Mr. L. Lechenger, for the winning debating team in the annual commencement contest of the literary societies; the Shotwell and Harris gold medal, the gift of Messrs. W. I. Shotwell and I. Harris, for the winner of the annual oratorical contest of the literary societies; the Wilson silver cup, the gift of Mrs. H. A. Wilson, for the winning team of the annual class debate of the young women's literary society; the Kalb basketball memorial silver cup, the gift of Mr. E. F. Kalb; and the Sweeney silver cup, the gift of the J. J. Sweeney Company, to be contested for annually in class track athletics. During the past year Mr. William M. Rice, Jr., has provided a cabinet for the preservation and exhibition of these and similar gifts and trophies of Rice local and intercollegiate contests. This elaborate cabinet, designed by Mr. R. A. Cram, supervising architect of the Institute, is one of the most beautiful examples of wood carving in America.

FIRST ANNUAL COMMENCEMENT

DEGREES IN COURSE CONFERRED

JUNE 12, 1916

PRELIMINARY ANNOUNCEMENT

FIRST ANNUAL COMMENCEMENT

At the first annual commencement convocation of the Rice Institute held at the conclusion of the fourth academic session the baccalaureate sermon was preached by the Reverend Peter Gray Sears, of Houston, and the commencement address was delivered by Chancellor David Starr Jordan, of Stanford University. On recommendation of the Faculty and by authority of the Trustees the President of the Rice Institute, at the final ceremonies in the Academic Court on the morning of June 12th, 1916, conferred on the first graduates the following degrees,[1] respectively:

Edmund McAshan Dupree, Bachelor of Science
Hattie Lel Red, Bachelor of Arts, with distinction
Bessie Walker Bankhead, Bachelor of Arts, with honors in German
James Lee Bramlette, Bachelor of Science
Harry Marshall Bulbrook, Bachelor of Arts
Ivan Roy Clede, Bachelor of Arts
Robert Emmett Cummings, Bachelor of Arts
Fay Earldine Dunseth, Bachelor of Arts, with distinction
Lenard Gabert, Bachelor of Science
Lela Jetta Goar, Bachelor of Arts
Oscar Frederic Green, Bachelor of Arts

[1] The degrees were conferred in the above order. The first candidate was the first matriculate; the second, the senior matriculate of the women graduates; the next twenty-five were also matriculates of the original class, the Freshman class of 1912–13; and the remaining candidates were listed in the order of their matriculation.

Nellie Grimes, Bachelor of Arts, with honors in Mathematics
Opal Josephine Hall, Bachelor of Arts
Ervin Frederick Kalb, Bachelor of Arts
Hildegarde Elizabeth Kalb, Bachelor of Arts, with distinction
Carl Milham Knapp, Bachelor of Science
Edith Jo Leeseman, Bachelor of Arts
William Max Nathan, Bachelor of Arts, with distinction
Norman Hurd Ricker, Bachelor of Arts, with honors in Physics
Ruth Robinson, Bachelor of Arts, with distinction
Elmer Edward Shutts, Bachelor of Science
J. Browder Spiller, Bachelor of Arts
William Marion Standish, Bachelor of Science
Lenore Wall, Bachelor of Arts, with distinction
Margaret Amy Waples, Bachelor of Arts
Herbert Wray Wilber, Bachelor of Science
Clinton Harcourt Wooten, Bachelor of Arts
Alice Crowell Dean, Bachelor of Arts, with honors in Mathematics
Ralph Dunning Longley, Bachelor of Arts
Casimir Perier McKenzie, Bachelor of Arts
Sarah Roach, Bachelor of Arts
Rollin Montfort Rolfe, Bachelor of Science
Margaret Ellen Schultz, Bachelor of Arts
Mary Fox, Bachelor of Arts
Otto Olive Watts, Bachelor of Arts

Walter Winfield Marshall, Master of Arts; B.A., Ohio State University, 1913.

LIST OF STUDENTS

1916–1917

PRELIMINARY ANNOUNCEMENT

CANDIDATES FOR ADVANCED DEGREES

Bankhead, Bessie Walker . . . . *Phoenix, Arizona*
B.A., Rice Institute, 1916.

Bramlette, James Lee . . . . . *Tolar, Texas*
B.S., Rice Institute, 1916.

Bray, Hubert Evelyn . . . . . *GreatYarmouth,England*
B.A., Tufts College, 1910;
M.A., Harvard University, 1916.

Bulbrook, Harry Marshall . . . *Greenville, Texas*
B.A., Rice Institute, 1916.

Cheney, Walter Lynn . . . . . *Lincoln, Nebraska*
B.A., Oberlin College, 1913;
M.A., University of Nebraska, 1915.

Clyce, Wallace Perrin . . . . . *Sherman, Texas*
B.A., Austin College, 1913.

Dean, Alice Crowell . . . . . *Houston, Texas*
B.A., Rice Institute, 1916.

Dixon, Alfred Alex . . . . . *Guilford, North Carolina*
B.S., Guilford College, 1909;
M.A., Haverford College, 1911.

Frizzell, Thomas Paul . . . . . *Knox City, Texas*
B.S., Texas Christian University, 1916.

Gabert, Lenard . . . . . *Houston, Texas*
B.S., Rice Institute, 1916.

Green, Oscar Frederic . . . . . *Houston, Texas*
B.A., Rice Institute, 1916.

Hall, Opal Josephine . . . . . *Houston, Texas*
B.A., Rice Institute, 1916.

Kalb, Ervin Frederick . . . . . *Houston, Texas*
B.A., Rice Institute, 1916.

Kalb, Hildegarde Elizabeth . . . *Bellaire, Texas*
B.A., Rice Institute, 1916.

McCann, Samuel Glenn . . . . . *Dresden, Ohio*
Ph.B., College of Wooster, 1914.

Perry, William Frederick . . . . *Houston, Texas*
M.A., Columbia University, 1909.

Porter, Everett Ellis . . . . . *Hughes Springs, Texas*
B.A., Baylor University, 1916.

Ricker, Norman Hurd . . . . . *Galveston, Texas*
B.A., Rice Institute, 1916.

Robinson, Ruth . . . . . *Clarendon, Texas*
B.A., Rice Institute, 1916.

Rolfe, Rollin Montfort . . . . . *Dallas, Texas*
B.S., Rice Institute, 1916.

Sherrick, Jacob L. . . . . *Pittsburgh, Pennsylvania*
B.S., Pennsylvania State College, 1910.

Standish, William Marion . . . *Houston, Texas*
B.S., Rice Institute, 1916.

Wilber, Herbert Wray . . . . . *Kingsville, Texas*
B.S., Rice Institute, 1916.

Winsor, Arthur S. . . . . *Woodstock, N. B.*
B.A., University of Mt. Allison, 1915.

Wood, Helen May . . . . . *Bellaire, Texas*
B.A., Drury College, 1909.

SENIOR CLASS

Bennett, Eleanor . . . . . *Dublin, Texas*
Benton, Verner Loraine . . . . *Houston, Texas*
Bright, Will Drane . . . . . *Sherman, Texas*
Bunting, Robert Lee . . . . . *Houston, Texas*

Cain, Otta Lee . . . . . *Yoakum, Texas*
Chandler, Richard Olney . . . . *Port Arthur, Texas*
Daugherty, Ruth . . . . . *Houston, Texas*
Eggers, G. W. Nordholtz . . . . *Galveston, Texas*
Fendley, Francis Tarrant . . . . *Galveston, Texas*
Fernandez, Rudolfo Hulen . . . *Houston, Texas*
Forrest, Robert Porter . . . . . *Mexia, Texas*
Fulwiler, Howard D. . . . . *Abilene, Texas*
Harris, Brantly Callaway . . . . *Thomasville, Georgia*
Harris, Fletcher Wootten . . . . *Thomasville, Georgia*
Heisig, Gladstone Bering . . . . *Houston, Texas*
John, Isabel Mary . . . . . *Houston, Texas*
Lindley, Cleveland Daniel[1] . . . *Houston, Texas*
Lokey, Clarence Walters . . . . *Lubbock, Texas*
Lowrie, Samuel Harman . . . . *Goldthwaite, Texas*
MacMaster, Helen . . . . . *Houston, Texas*
McFaddin, William P. H., Jr. . . *Beaumont, Texas*
Michaux, Maud . . . . . *Houston, Texas*
Millis, Eugene Russell . . . . . *Houston, Texas*
Niland, John Emmet . . . . . *Galveston, Texas*
Pattillo, Thomas Brewington . . *Cisco, Texas*
Rayzor, Jesse Newton . . . . . *Denton, Texas*
Riley, Robert Milton . . . . . *Emporia, Kansas*
Rothrock, Edward Streicher . . *Mercedes, Texas*
Sanders, Isaac C. . . . . *Tyler, Texas*
Sanford, Clarence Morrow . . . *Houston, Texas*
Sullivan, Ruth . . . . . *Temple, Texas*
Teal, Wiley Beecher . . . . . *Dallas, Texas*
Tilley, Robert Nelson . . . . . *Huntsville, Texas*
Tomfohrde, Albert . . . . . *Houston, Texas*
Traylor, George Hamilton . . . *Mount Pleasant, Texas*
Underwood, Francis Joseph . . . *Galveston, Texas*

[1] Died January 2, 1917.

Underwood, Patrick Henry . . . *Galveston, Texas*
Victor, Harry . . . . . *Odessa, Russia*
Waggaman, Adèle . . . . . *Houston, Texas*
Waters, James Stephen, Jr. . . . *Galveston, Texas*
Weinberg, Helen Celestine . . . *Houston Heights, Texas*
Whitfield, Voelian Winton . . . *Morrisville, Texas*
Willner, Zillah Longfellow . . . *Houston, Texas*
Woodruff, Lewis Jay . . . . . *Blessing, Texas*
Yeatman, Richard Preston . . . *Marion, Alabama*

JUNIOR CLASS

Abbey, Wilbur Milo . . . . . *Port Arthur, Texas*
Barber, Helen Browder . . . . . *Houston Heights, Texas*
Barron, William Ralph . . . . . *Houston, Texas*
Béraud, Louise Jane . . . . . *Sheridan, Texas*
Brooks, S. Raymond . . . . . *Flournoy, Louisiana*
Brown, W. Edward . . . . . *Beaumont, Texas*
Bryan, Andrew Bonnell . . . . *Felicia, Texas*
Buse, Howard Emmett . . . . . *Houston, Texas*
Cabaniss, Cramer Clark . . . . . *Lockhart, Texas*
Carter, John Winston . . . . . *Houston, Texas*
Coleman, Joseph Pickens . . . . *Little Rock, Arkansas*
Colston, Thomas Marshall . . . *Kingsville, Texas*
Cunningham, Kenneth Wallace . *Beaumont, Texas*
Della Valle, Emil H. . . . . *Bridgeport, Connecticut*
Duggan, Alston Hardy . . . . . *San Antonio, Texas*
Ellis, Alline Marie . . . . . *Houston Heights, Texas*
Ford, Fannie Rivers . . . . . *Houston, Texas*
Fouts, Floyd Festus . . . . . *Cleveland, Texas*
Harp, John Holland . . . . . *Mount Pleasant, Texas*
Harris, Gwin Chandler . . . . . *Lubbock, Texas*
Hathorn, Edwin Hall . . . . . *Mount Pleasant, Texas*

Hathorn, John Broadus . . . . *Mount Pleasant, Texas*
Hodges, Carrie . . . . . *Nacogdoches, Texas*
Hodges, Leland Allen . . . . . *Georgetown, Texas*
Ilfrey, Lawrence Galloway . . . *Houston, Texas*
Keiller, Thomas Mitchell . . . . *Galveston, Texas*
Markham, James Philip . . . . *Victoria, Texas*
McAllister, Florence Betsy . . . *Camden, Arkansas*
McFarland, John William . . . . *Brownwood, Texas*
Meharg, Virgil Edward . . . . *Turnersville, Texas*
Middleton, Edmund Burrus . . . *Eagle Lake, Texas*
Middleton, Errol . . . . . *Victoria, Texas*
Morgan, Ethel . . . . . *Houston, Texas*
Reybaud, William Henry . . . *Galveston, Texas*
Ricketts, Anna . . . . . *Houston, Texas*
Riglander, Hazel . . . . . *Houston, Texas*
Rosenthall, Leon Chester . . . . *Houston, Texas*
Rothrock, Ralph Kinnan . . . . *Mercedes, Texas*
Rowe, Elsbeth Thompson . . . . *Houston, Texas*
Rudd, Charles Maples . . . . . *Temple, Texas*
Saper, Paul Gerson . . . . . *Houston, Texas*
South, Ira . . . . . *Houston, Texas*
Stockwell, Florence Elaine . . . *Beaumont, Texas*
Stone, Barton William . . . . . *Georgetown, Texas*
Stratford, Mary Jane . . . . . *Houston, Texas*
Tillett, Henry Augustus, Jr. . . . *Abilene, Texas*
Waggaman, Camille . . . . . *Houston, Texas*
Wheeler, George Carlos . . . . *Bonham, Texas*
White, Lloyd Young . . . . . *Waco, Texas*
Worley, Florence . . . . . *Houston, Texas*

SOPHOMORE CLASS

Ansley, John Sherwood . . . . . *La Porte, Texas*
Bailey, Herbert A. . . . . *Pittsburg, Texas*
Bailey, John Edwin . . . . . *Franklin, Louisiana*
Banks, Reba Elizabeth . . . . . *Kirbyville, Texas*
Bass, Henry K. . . . . *Abilene, Texas*
Baty, Joseph Russ . . . . . *Palestine, Texas*
Bayer, Robbie Elizabeth . . . . *Huntingdon, Tennessee*
Belcia, Ross Ivan . . . . . *Ged, Louisiana*
Billups, Val T. . . . . *Winters, Texas*
Brick, Shirley Eclipse . . . . . *Fort Worth, Texas*
Briant, Willie Victor . . . . . *Houston, Texas*
Campbell, Robert Keener . . . . *Houston, Texas*
Carr, Alfred Lewin . . . . . *Marlin, Texas*
Carroll, Festus Royal . . . . . *Houston, Texas*
Cockrell, Varue Odlea . . . . . *Houston, Texas*
Cockrell, Maybelle . . . . . *Houston, Texas*
Conyers, Henry . . . . . *Providence, R. I.*
Cottingham, Mary Cassidy . . . *Houston, Texas*
Crittenden, John Frank . . . . . *Houston, Texas*
Dannenbaum, Maurice Nathan . *Houston, Texas*
Darling, Clarence Ransome . . . *Houston, Texas*
Davis, Glen Irving . . . . . *Greenville, Texas*
Dawson, Harry Edward . . . . *Floydada, Texas*
Dodge, Harris Taylor . . . . . *Houston, Texas*
Dormant, Julian Austin . . . . . *Houston, Texas*
Drummond, John George . . . . *Gatesville, Texas*
Dukes, George Marshall . . . . *Houston, Texas*
Dutton, Daniel Fleming . . . . *Beaumont, Texas*
Easterwood, Charles Grandison . *Hearne, Texas*
Eisenlohr, Otto Hugo . . . . . *Dallas, Texas*

Erkel, Olive Lorraine . . . . . *San Antonio, Texas*
Evans, Oliphant Shelley . . . . *San Antonio, Texas*
Farthing, Milton Ephraim . . . *Houston, Texas*
Fleet, Philip . . . . . *Berditchew, Russia*
Frost, Kenneth . . . . . *Houston, Texas*
Gaines, Ethel Conklin . . . . . *Houston, Texas*
Gard, Edith . . . . . *Houston, Texas*
Gemmer, Kathleen Helena . . . *Houston, Texas*
George, Alexander . . . . . *San Antonio, Texas*
George, Berta Clare . . . . . *Waller, Texas*
Gillespie, Margaret Elizabeth . . *Houston, Texas*
Gordon, Harry . . . . . *Houston, Texas*
Greenman, Eric Raymond . . . *Pueblo, Colorado*
Gripon, Lee Hardy . . . . . *Beaumont, Texas*
Hail, Jennie Jones . . . . . *Houston, Texas*
Hammersmith, Minnie . . . . . *Houston, Texas*
Hanna, Alma Bernice . . . . . *Houston, Texas*
Haynes, Naomi Anna . . . . . *Houston, Texas*
Heywood, Thomas Owen . . . . *Mount Vernon, Texas*
Hill, Lawrence Leslie . . . . . *Houston, Texas*
Hirsch, Tillie Paulene . . . . . *Houston, Texas*
Houck, Alexander Clyde . . . . *Houston, Texas*
Jackson, William Ralph . . . . *Enloe, Texas*
Kennedy, Mabel Louise . . . . *Bay City, Texas*
Killough, Joseph Evans . . . . *Bonham, Texas*
King, Paul . . . . . *Katy, Texas*
Kingsland, Lawrence Myrick . . *Houston, Texas*
Knight, Orissa . . . . . *Houston, Texas*
Kramer, Warren Alvin . . . . . *Franklin, Louisiana*
Lamar, Lucius Mirabeau, Jr. . . *San Antonio, Texas*
Landram, Robert Bates, Jr. . . . *Houston, Texas*
Lane, Sarah Louise . . . . . *Houston, Texas*
Lasay, Celeste Parellada . . . . *Montblanch, Spain*

Leveridge, John Haywood . . . *East Bernard, Texas*
Lillard, Roy Embry . . . . . *Bowie, Texas*
Lorehn, Edmond Louis . . . . . *Houston, Texas*
Lovelace, Law Lawson . . . . . *San Angelo, Texas*
Managan, William Henry, Jr. . . . *Westlake, Louisiana*
Manaker, Fred Philip . . . . . *Fulshear, Texas*
Martin, Gladys . . . . . *Houston, Texas*
McCarty, Mary Denoailles . . . *Houston, Texas*
McWhorter, Albert William . . . *Houston, Texas*
Millis, Walter Thompson . . . . *Houston, Texas*
Moore, Jack Wallace . . . . . *Comanche, Texas*
Morgan, Joseph Guiton . . . . . *Dallas, Texas*
Murphy, Thomas Elza . . . . . *Brownwood, Texas*
Patten, Robert William . . . . . *Jasper, Texas*
Payne, John Pierre . . . . . *Haskell, Texas*
Peterman, Edward Hanson . . . *Franklin, Louisiana*
Pfeuffer, Elsie . . . . . *New Braunfels, Texas*
Rather, John Thomas, Jr. . . . . *Belton, Texas*
Randolph, Thomas Worsham . . *Huntsville, Texas*
Saunders, John Bacon . . . . . *Bonham, Texas*
Simons, Thomas Shirley . . . . *Fort Worth, Texas*
Snoddy, Elizabeth . . . . . *Houston, Texas*
South, Ruby Bell . . . . . *Houston, Texas*
Speer, May Aurelia . . . . . *Houston, Texas*
Spiller, Joe Rice . . . . . *Esperanza, Texas*
Stratford, William Malcolm . . . *Houston, Texas*
Streusand, Esther . . . . . *Houston, Texas*
Sullivan, Frances Eudora . . . . *Houston, Texas*
Sutcliffe, John Robert . . . . . *San Antonio, Texas*
Sweeney, Edward Morris . . . . *Bonham, Texas*
Swope, Juanita Helen . . . . . *Houston, Texas*
Thomas, Esther Elizabeth . . . . *Houston, Texas*
Thomas, Talmage DeWitt . . . *Greenville, Texas*

PRELIMINARY ANNOUNCEMENT

Turnbull, Pender . . . . . *Houston, Texas*
Vernor, John Wilbur . . . . . *Lampasas, Texas*
Wallace, John Homer . . . . . *Rockwall, Texas*
Ward, Mavis Kathlyne . . . . . *Reagan, Texas*
Ware, Zuleika . . . . . *Houston, Texas*
Watson, David Robertson . . . . *Austin, Texas*
Wells, Tullis Pierce . . . . . *Fort Worth, Texas*
Whitaker, Francis Hunter . . . *Beaumont, Texas*
Winston, John McClure . . . . *Weatherford, Texas*
Wolf, Freddie Sybil . . . . . *Houston, Texas*
Yelverton, John Henry . . . . . *Riverside, Texas*
Zuber, Philip . . . . . *Houston, Texas*

FRESHMAN CLASS

Acree, James Leonard, Jr. . . . *Dothan, Alabama*
Aleo, Peter George . . . . . *Houston, Texas*
Alexander, Jay . . . . . *Dallas, Texas*
Allen, Walter Payne, Jr. . . . . *Terrell, Texas*
Almeras, Pierre Numa . . . . . *Galveston, Texas*
Anderson, Guy Dillard . . . . . *Wichita Falls, Texas*
Andrews, Mark William . . . . *Brownwood, Texas*
Andrews, Will Allen . . . . . *Texarkana, Texas*
Aschbacher, Melba Rhea . . . . *Victoria, Texas*
Ashburn, Samuel Armstrong . . *Bruceville, Texas*
Atkinson, Charles Harold . . . . *Del Rio, Texas*
Badt, Clarance Lawrence . . . . *Mount Pleasant, Texas*
Baker, Peter Willis, Jr. . . . . *Carthage, Texas*
Baker, Richard Royal, Jr. . . . . *Crockett, Texas*
Baldwin, Lucille Coons . . . . . *Houston, Texas*
Bales, Henry Olaf . . . . . *De Queen, Arkansas*
Ballard, Raymond Marley . . . *Goldthwaite, Texas*

Bartle, Will Otis . . . . . *Cleveland, Texas*
Beazley, Hamilton . . . . . *La Porte, Texas*
Bell, Hugh LeRoy . . . . . *Edmond, Oklahoma*
Berwin, Lenore Judith . . . . . *Houston, Texas*
Bianski, Andrew . . . . . *Chicago, Illinois*
Birdwell, Glenn Dawson . . . . *Overton, Texas*
Blakeney, George Stuart . . . . *Bonham, Texas*
Block, Sadie . . . . . *Houston, Texas*
Blumberg, John Robert . . . . . *Seguin, Texas*
Bobb, Paul Frederick . . . . . *Livingston, Texas*
Borum, Bertha Mae . . . . . *Houston Heights, Texas*
Boyd, Laurence Everet . . . . . *Houston, Texas*
Boyles, Reba Scott . . . . . *Houston, Texas*
Bonner, John Wayne . . . . . *Glennwood, Arkansas*
Bonner, Jesse Lafayette . . . . *Lufkin, Texas*
Bos, Herman Peter . . . . . *Port Arthur, Texas*
Boynton, Paul Lewis . . . . . *Belton, Texas*
Brand, Lucille Agnes . . . . . *Houston, Texas*
Bradley, Max . . . . . *Peabody, Kansas*
Bradley, Roland Barr . . . . . *Houston, Texas*
Bradshaw, Dorothy Stutzman . . *Houston Heights, Texas*
Breen, Michael . . . . . *Mineola, Texas*
Brennan, John Patrick . . . . . *Houston, Texas*
Brevard, Horace Eddy . . . . . *San Marcos, Texas*
Brockman, Mary Katherine . . . *Houston, Texas*
Brogniez, Frank Philip . . . . . *Houston, Texas*
Bromberg, Leon . . . . . *Galveston, Texas*
Brooking, Willard Traylor . . . *Sinton, Texas*
Brooks, John Caperton . . . . . *Houston, Texas*
Brown, George Rufus . . . . . *Temple, Texas*
Brown, Homer . . . . . *Tyler, Texas*
Bryant, David Ezekiel . . . . . *Pottsboro, Texas*
Buchanan, Kate Harding . . . . *Houston, Texas*

Buchanan, Ruth Alexander . . . *Houston, Texas*
Burnett, Thomas Jefferson . . . *Fischer Store, Texas*
Butler, Iva Alice . . . . . *Houston, Texas*
Butler, Lawrence Oris . . . . . *Dallas, Texas*
Butler, Minnie Joyce . . . . . *Houston, Texas*
Byron, Ruth Shelby . . . . . *Weatherford, Texas*
Cain, Edgar Allan . . . . . *Yoakum, Texas*
Carmichael, Roy . . . . . *Saint Jo, Texas*
Carson, Clarence Leon . . . . . *Texarkana, Texas*
Carson, Jack Harlyn . . . . . *San Antonio, Texas*
Carter, Ike Newton . . . . . *Cuero, Texas*
Cason, Dick Kendall, Jr. . . . . *Nacogdoches, Texas*
Cherry, Edgar Lewis . . . . . *Beaumont, Texas*
Chesnutt, William Bernard . . . *Houston,Texas*
Clark, Fred Paul . . . . . *San Angelo, Texas*
Clark, Wade Lewis . . . . . *Nocona, Texas*
Clayton, Clyde Clement . . . . . *Houston, Texas*
Coates, Thomas Lee . . . . . *Edna, Texas*
Cockrill, Ben Rogers . . . . . *Smithville, Texas*
Coghlan, Margaret Beatrice . . . *Houston, Texas*
Cohen, Herman M. . . . . *Houston, Texas*
Coleman, Stewart Percy . . . . *Corpus Christi, Texas*
Comfort, Georgia Whitsette . . . *Dallas, Texas*
Combs, William Arthur . . . . *Angleton, Texas*
Corbett, James Louis, Jr. . . . . *Texas City, Texas*
Corley, Vera Bonner . . . . . *Lufkin, Texas*
Cox, Armand Vinicus . . . . . *Dallas, Texas*
Crisp, Vachel Weldon . . . . . *Cuero, Texas*
Dain, James Warren . . . . . *Smithville, Texas*
Davis, Simeon Edison . . . . . *Houston, Texas*
Davison, Frances Lucille . . . . *Hubbard, Texas*
Davison, Hugh Lloyd . . . . . *Hubbard, Texas*
Del Barto, Pete Frank . . . . . *Orange, Texas*

Delahoussaye, Edward Anthony . *Franklin, Louisiana*
Denham, Jesse Eldon . . . . . *Bowie, Texas*
Doney, Doris Louise . . . . . *Houston, Texas*
Doughtie, Venton Levy . . . . . *Hufsmith, Texas*
Douthit, Walton Emory . . . . *Rockdale, Texas*
Dowell, Cleo Lafoy . . . . . *Port Arthur, Texas*
Downs, Bertha Anita . . . . . *Houston, Texas*
Drummet, Paul . . . . . *Houston, Texas*
Dunlap, Bernard Price . . . . . *Dallas, Texas*
Dunn, Mary Ellen . . . . . *Houston, Texas*
Egan, Herol Ward . . . . . *Mulvane, Kansas*
Eaton, Thomas Benton . . . . . *Houston Heights, Texas*
Edgar, Cecil Elmo . . . . . *Yoakum, Texas*
Elder, John Clark . . . . . *Pilot Point, Texas*
Ellis, Athna Bryan . . . . . *Palestine, Texas*
Elliott, Grace Eleanor . . . . . *Rosharon, Texas*
Embree, Elisha Davont . . . . . *Belton, Texas*
Emden, Louis . . . . . *Houston, Texas*
Ewell, Sylvester Harvey . . . . *Roswell, New Mexico*
Faber, Ernest . . . . . *Eagle Lake, Texas*
Failor, Ellamarye . . . . . *Guy, Texas*
Faught, Charles Burnett . . . . *Houston, Texas*
Filson, Katherine . . . . . *Houston, Texas*
Finch, Henry Arthur, Jr. . . . . *McKinney, Texas*
Finfrock, Jean Paul . . . . . *Houston Heights, Texas*
Foote, Frances . . . . . *Terrell, Texas*
Forbes, Arthur Lee, Jr. . . . . *Houston, Texas*
Ford, William Ward . . . . . *Houston, Texas*
Foster, Francis Margaret . . . . *Houston, Texas*
Fraley, Fred William . . . . . *Houston, Texas*
Frost, Clarence Montgomery . . *Houston, Texas*
Fruit, Julian Elliot . . . . . *Timpson, Texas*
Gallaher, Edith Catharine . . . . *Houston, Texas*

Gamble, Loy Lee . . . . . *Memphis, Texas*
Garbrecht, Charles . . . . . *San Antonio, Texas*
Gaugler, Kurtz Edward . . . . *Houston, Texas*
Geary, Geneva Gladys . . . . . *Houston Heights, Texas*
Gee, Worthy Holland . . . . . *Troup, Texas*
Geller, Abram Lewis . . . . . *Houston, Texas*
Gemmer, Edwin Philip . . . . . *Houston, Texas*
Gerhardt, Manfred James . . . *Houston, Texas*
Giammalva, Joe Carlos . . . . . *Houston, Texas*
Godwin, James Warren . . . . . *Houston Heights, Texas*
Goldberg, Josh Seligman . . . . *Dallas, Texas*
Gomillion, Howell Montgomery . *Lockhart, Texas*
Gomperts, Anna Raymond . . . *Houston, Texas*
Goss, Warren Eldridge[1] . . . . *Houston, Texas*
Graves, Katherine Howard . . . *Houston, Texas*
Gray, David Fuqua . . . . . *Houma, Louisiana*
Gray, Duncan Montgomery . . . *Meridian, Mississippi*
Green, George Maverick . . . . *San Antonio, Texas*
Griffin, Philip Clyde . . . . . *Itasca, Texas*
Gross, Frances Barbara . . . . . *Marshall, Texas*
Grun, Charles August . . . . . *Yorktown, Texas*
Grunewald, Lillian Mary . . . . *Houston, Texas*
Guitar, Repps Bedford . . . . . *Abilene, Texas*
Hall, Walter William . . . . . *La Porte, Texas*
Haltom, Lee . . . . . *San Antonio, Texas*
Hamilton, Willard Stephens . . . *Thrall, Texas*
Hammersmith, May . . . . . *Houston, Texas*
Hanna, James Scott . . . . . *Galveston, Texas*
Hardin, Robert . . . . . *Uvalde, Texas*
Harrel, Arabella . . . . . *Houston, Texas*
Harris, James Kilbourne, Jr. . . *San Antonio, Texas*
Hart, Louis Folwell . . . . . *Hillsboro, Texas*

[1] Died October 20, 1916.

Hayes, James Joseph, Jr. . . . . *Brownwood, Texas*
Haynes, Mary Louise . . . . . *Houston, Texas*
Hays, Lydia Alice . . . . . *Kingsville, Texas*
Hebert, Edmond Haile . . . . . *Timpson, Texas*
Hedges, Kenneth Paul . . . . . *Houston, Texas*
Heffernan, Helen Marie . . . . *Houston, Texas*
Helland, Sven Paul . . . . . *San Antonio, Texas*
Heywood, Milton Scott . . . . . *Mount Vernon, Texas*
Higgins, Loraine . . . . . *Reagan, Texas*
Hilliard, Mollie . . . . . *Houston, Texas*
Hilswick, Mildred Maurine . . . *Houston, Texas*
Hines, John Henderson . . . . . *Uvalde, Texas*
Hinkley, Burt E., Jr. . . . . *Brownsville, Texas*
Holley, Helen Beauregard . . . *Houston, Texas*
Holloway, Robert Randolph . . . *Comanche, Texas*
Hopkins, Ralph Goodrich . . . . *Fort Worth, Texas*
Hubbell, Olive Grace . . . . . *Bellaire, Texas*
Humber, Jason . . . . . *Albany, Texas*
Hurley, Charles Webster, Jr. . . *Houston, Texas*
Ingram, Genevieve . . . . . *Houston, Texas*
Irby, Richard Edward . . . . . *Beaumont, Texas*
Jackson, Mary . . . . . *Houston, Texas*
Jackson, Thomas Hardy . . . . *Houston Heights, Texas*
James, John Kendrick . . . . . *Houston, Texas*
Jarratt, John Archer . . . . . *Port Arthur, Texas*
Jarvis, Barney Word . . . . . *Terrell, Texas*
Jarvis, Dudley Crawford . . . . *Terrell, Texas*
John, Roberta Alexander . . . . *Houston, Texas*
Josey, Jack Evander, Jr. . . . . *Beaumont, Texas*
Jungman, J. Frank . . . . . *Hondo, Texas*
Juran, Max Osias . . . . . *Houston, Texas*
Kahn, Dan Benjamin . . . . . *Houston, Texas*
Keeling, Arthur . . . . . *Wortham, Texas*

Keller, Helen Closner . . . . . *Houston, Texas*
King, Leonidas McAdoo . . . . *Houston, Texas*
King, Loena . . . . . *Houston, Texas*
King, Sidney Ercel . . . . . *San Angelo, Texas*
King, William Clark . . . . . *San Antonio, Texas*
Kirby, Mrs. William Blain . . . *San Angelo, Texas*
Kirksey, Morris Marshall . . . . *Palo Alto, California*
Klotz, John Frederick . . . . . *Maxia, Texas*
Knapp, Jack Lewis . . . . . *Houston, Texas*
Knudsen, Bertha Arline . . . . *Houston, Texas*
Krause, Rudolph Edward . . . . *Lake Charles, Louisiana*
Lassetter, Gerald Culberson . . . *Comanche, Texas*
Latham, William Henry, Jr. . . . *Franklin, Louisiana*
Latimer, Emile Lee . . . . . *Gilmer, Texas*
Lauterstein, Jennie Rose . . . . *Llano, Texas*
Lee, Dorothy . . . . . *Houston, Texas*
Levy, Abe . . . . . *Houston, Texas*
Levy, Amelia . . . . . *Houston, Texas*
Lindley, Gladys . . . . . *Houston, Texas*
Lockett, Annie Beth . . . . . *Houston, Texas*
Logan, William Hamilton, Jr. . . *Bellaire, Texas*
Lottman, Otto John . . . . . *Houston, Texas*
Lovett, Adelaide . . . . . *Houston, Texas*
Lubbock, Katherine Adair . . . *Houston, Texas*
Luecke, Theodore Edward . . . *Wichita Falls, Texas*
Lunn, Edwin Noland . . . . . *Houston, Texas*
Lyon, Shelby Bouldin . . . . . *Houston, Texas*
Maas, Louis Littman . . . . . *Houston, Texas*
MacMaster, Grace Fox . . . . . *Houston, Texas*
Madero, Carlos Benjamin . . . . *San Antonio, Texas*
Mantooth, Mollie Lucille . . . . *Lufkin, Texas*
Marshall, Robert William Keifer . *Temple, Texas*
Matthews, Benjamin Rush . . . *Harrisburg, Texas*

Matthews, Roberta Lee . . . . . *Harrisburg, Texas*
Matthewson, Harold Grant . . . *Dallas, Texas*
Mayer, Benjamin Foster . . . . *Port Arthur, Texas*
McCollough, Byron Godfrey . . *Houston, Texas*
McCrummen, Robert Foy . . . . *Lubbock, Texas*
McFarland, Emmett Henry . . . *Brownwood, Texas*
McGlaum, Carl Edman . . . . . *Guffey, Texas*
McIlhenny, Isbell Franklin . . . *San Antonio, Texas*
Meador, Newton Eugene, Jr. . . *Houston, Texas*
Mears, Joe Leonidas, Jr. . . . . *Wichita Falls, Texas*
Meek, Dudley . . . . . *San Antonio, Texas*
Meitzen, Arthur Rudolph . . . . *Bastrop, Texas*
Mendlovitz, Harry . . . . . *Houston, Texas*
Mendlovitz, Joe . . . . . *Houston, Texas*
Merrick, Ward Mitchell . . . . *Galveston, Texas*
Michael, Vera . . . . . *Houston, Texas*
Mickelborough, Reba . . . . . *Houston, Texas*
Middleton, Wayne . . . . . *Victoria, Texas*
Milburn, Douglas . . . . . *Mexia, Texas*
Miller, Edward Dunlap . . . . . *Waxahachie, Texas*
Miller, Kenney Nicholas . . . . *Houston, Texas*
Mills, Maurine . . . . . *Houston, Texas*
Millsapps, Paul . . . . . *Houston, Texas*
Milnes, Jean . . . . . *Bellaire, Texas*
Mitchell, Jefferson Woolf . . . . *Cincinnati, Ohio*
Moechel, Renee Marie . . . . . *Pasadena, Texas*
Moler, William Henry . . . . . *Brownsville, Texas*
Moore, Buhl . . . . . *Smithville, Texas*
Moore, Mary Terese . . . . . *Houston, Texas*
Moore, Willard Houghton . . . *Dallas, Texas*
Montgomery, William . . . . . *Galveston, Texas*
Morales, Rita M. . . . . *Houston, Texas*
Morgan, Herbert Bush . . . . . *Granbury, Texas*

Morrison, Lucy Vassar . . . . . *Houston, Texas*
Mullane, William Adrian . . . . *Houston, Texas*
Munz, Lewis Edgar . . . . . *Texarkana, Texas*
Nau, Capatolia Cecelia . . . . . *Houston Heights, Texas*
Nelson, Edward Young . . . . *Pittsburg, Texas*
Neyland, Archie Jerome . . . . *Charco, Texas*
Neyland, Watson Augustus . . . *Liberty, Texas*
Nichols, George . . . . . *Hutchinson, Kansas*
Nicholson, Lillian Louise . . . . *Galveston, Texas*
Nolf, Vera Mae . . . . . *Wadsworth, Ohio*
Nugent, Ruth . . . . . *Houston, Texas*
Nussbaum, Hervin Wolfe . . . . *Eagle Lake, Texas*
Nutter, Henry Coleman . . . . *Henrietta, Texas*
Ogilvie, Janie . . . . . *Houston, Texas*
O'Leary, Lillian Ione . . . . . *Houston, Texas*
Omohundro, Philip Sherburn . . *Beaumont, Texas*
O'Roark, Walter Nathaniel . . . *Guffey, Texas*
Parker, James Franklin . . . . . *Houston, Texas*
Parker, John . . . . . *Tyler, Texas*
Patterson, Charles Hazen . . . . *Houston, Texas*
Patterson, Gladys Alleen . . . . *Houston, Texas*
Pearson, Ottis Amelia . . . . . *Houston, Texas*
Penman, Marie Celeste . . . . . *Houston, Texas*
Pennybacker, Charles Dana . . . *Palestine, Texas*
Pequigney, Frank . . . . . *Galveston, Texas*
Peterson, Fendell B. . . . . *Bellaire, Texas*
Peterson, Jesse Raymond . . . . *Rosenberg, Texas*
Peterson, Melvin Raymond . . . *Kingsville, Texas*
Platt, Emma Lucissia . . . . . *Houston, Texas*
Pollard, Mary Fuqua . . . . . *Houston, Texas*
Porter, Mildred Armistead . . . *Houston, Texas*
Potts, James Putman . . . . . *Wichita Falls, Texas*
Putnam, Irene . . . . . *Houston, Texas*

Putney, Alice . . . . . *Eagle Lake, Texas*
Pyne, Carolee Dewitt . . . . . *Houston, Texas*
Radoff, Morris . . . . . *Houston, Texas*
Ragland, William Shaw . . . . *Mercedes, Texas*
Reavley, Thomas Mack, Jr. . . . *Alba, Texas*
Red, Samuel Clark, Jr. . . . . *Houston, Texas*
Redfield, Helen . . . . . *Houston, Texas*
Renick, Mary Louise . . . . . *Houston, Texas*
Riddle, Nathan Gilbert . . . . . *Davis, West Virginia*
Riedel, Wilfred Herman . . . . *Yorktown, Texas*
Robinson, Maynard William . . *Temple, Texas*
Robinson, Reid Vance . . . . . *Clarendon, Texas*
Robinson, Wilbourn Thomas . . *Huntsville, Texas*
Rooke, Richard Durvant . . . . *Nacogdoches, Texas*
Russo, Samuel Anthony . . . . *Houston, Texas*
Salisbury, Samuel Wilson . . . . *Crockett, Texas*
Sanders, Ossie Alice . . . . . *Houston, Texas*
Saunders, John Laroy . . . . . *Smithville, Texas*
Schadt, William Frederick, Jr.. . *Galveston, Texas*
Schellhardt, Morris Adams . . . *Smithville, Texas*
Schirmer, Anna Gilliland . . . . *Houston, Texas*
Schlom, Louis Henry . . . . . *Houston, Texas*
Shannon, Joseph Robert . . . . *La Porte, Texas*
Shaw, Clifton Raymond . . . . *Weatherford, Texas*
Shaw, John Feary . . . . . *Houston, Texas*
Sheffield, John Otis . . . . . *Bowie, Texas*
Shriner, Helen Emma . . . . . *Houston, Texas*
Skiles, William Sydney . . . . . *Richardson, Texas*
Smilovitz, Maurice . . . . . *Houston, Texas*
Smith, Blakely . . . . . *Houston, Texas*
SoRelle, Heloise . . . . . *Many, Louisiana*
Soroker, Mrs. Esther . . . . . *Nicholaijew, Russia*
South, Dudley Pritchett . . . . *Houston, Texas*

South, Helen . . . . . *Houston, Texas*
Sproles, William Soloman, Jr. . . *Angleton, Texas*
Starnes, Roy Wayne . . . . . *Galveston, Texas*
Stephenson, Douglas Joseph . . *Beaumont, Texas*
St. John, Ralph Vaughan . . . . *Palestine, Texas*
Still, Ben Ivor . . . . . *Houston, Texas*
Swilley, Mildred Lucille . . . . *Houston Heights, Texas*
Talbot, Mount William . . . . . *Lake Charles, Louisiana*
Tate, Karl Franklin . . . . . *Comanche, Texas*
Taylor, Roy Alfred . . . . . *Houston, Texas*
Terrell, Mrs. Albert Langley . . *Houston, Texas*
Thomas, Albert Langston . . . . *Nacogdoches, Texas*
Thomas, Thelma . . . . . *Houston, Texas*
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Welsh, Hugh Clayton . . . . . *Haskell, Texas*
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White, Bessie . . . . . *Houston, Texas*

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Wilson, Mabel Virginia . . . . . *Houston, Texas*
Wilson, William Abner, Jr. . . . *Houston, Texas*
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Wolf, Lillie Arabella . . . . . *Houston, Texas*
Wood, Charles Edgar . . . . . *Houston, Texas*
Wood, Velma . . . . . *Houston, Texas*
Wooldridge, Horace Stuart . . . *Gainesville, Texas*
Worley, Margaret . . . . . *Houston Heights, Texas*
Wortham, Cad Carter . . . . . *Houston, Texas*
Zama, Augustus Van . . . . . *Hazelhurst, Mississippi*
Zama, Henry Faravelli . . . . . *Hazelhurst, Mississippi*

SPECIAL STUDENTS

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