GEORGIA INSTITUTE OF TECHNOLOGY

12

BULLETIN

ANNOUNCEMENTS 1955-1956

ATLANTA, GEORGIA

1955 . . 1956 . . 1957

JULY

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UNIVERSITY SYSTEM OF GEORGIA
Vol. 68 April, 1955 Number 2
BULLETIN

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, Georgia

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DEPARTMENT OF INDUSTRIAL EDUCATION
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GEORGIA TECH RESEARCH INSTITUTE (Cooperating Agency)

Edited and Published by Department of Public Relations, Georgia Institute of Technology

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CALENDAR 1955-56

SUMMER QUARTER 1955

June 22	New students report for orientation.
June 27	Registration.
June 28	Classes begin.
June 29	Late registration fees apply.
July 2	Last day for registration. Last day for adding a subject to study list.
July 4	Holiday.
July 18	Last day for dropping a subject from study list without penalty.
Aug. 6	End of deficiency report period.
Sept. 10	End of term.

FALL QUARTER 1955

Sept. 15	All entering freshmen report for orientation.
Sept. 21	Transfer students report for schedule conferences.
Sept. 26	Registration of upper classmen and transfer students.
Sept. 27	Classes begin.
Sept. 28	Late registration fees apply.
Oct. 1	Last day for registration. Last day for adding a subject to study list.
Oct. 17	Last day for dropping a subject from study list without penalty.
Nov. 5	End of deficiency report period.
Nov. 24-27	Thanksgiving recess.
Dec. 17	End of term.
Dec. 18-Jan. 2	Christmas recess.

WINTER QUARTER 1956

Jan. 3	Registration.
Jan. 4	Classes begin.
Jan. 5	Late registration fees apply.
Jan. 7	Last day for registration. Last day for adding a subject to study list.
Jan. 24	Last day for dropping a subject from study list without penalty.
Feb. 11	End of deficiency report period.
March 17	End of term.
March 18-25	Spring recess.

SPRING QUARTER 1956

March 21	New students report for orientation.
March 26	Registration.
March 27	Classes begin.
March 28	Late registration fees apply.
March 31	Last day for registration. Last day for adding a subject to study list.
April 16	Last day for dropping a subject from study list without penalty.
May 5	End of deficiency report period.
June 9	End of term.
June 10	Baccalaureate sermon.
June 11	Commencement.

SUMMER QUARTER 1956

June 25	Registration.
June 26	Classes begin.
Sept. 8	End of term.

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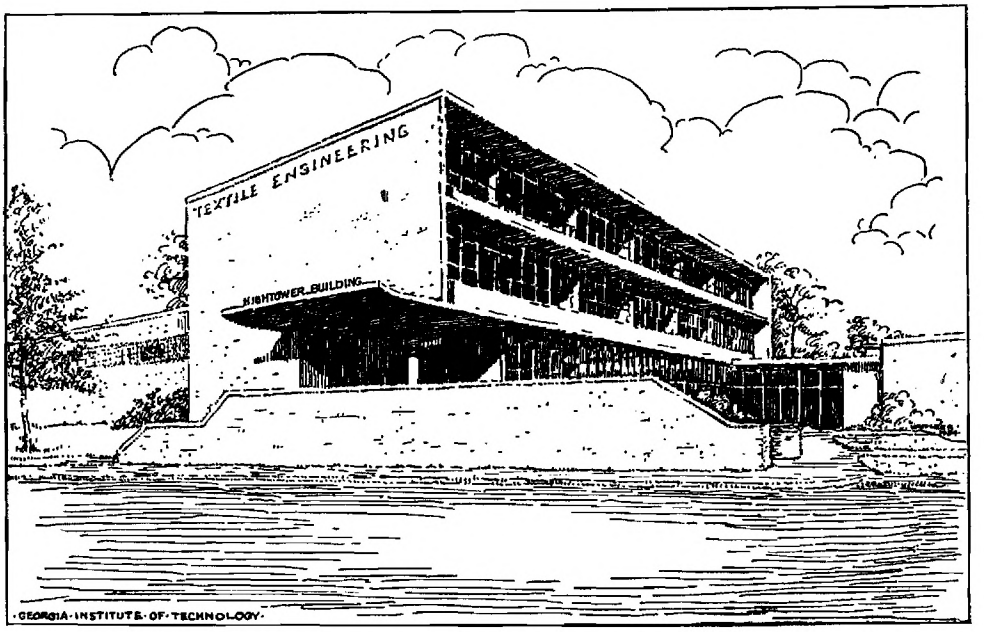
TEXTILE ENGINEERING
HIGHTOWER BUILDING
GEORGIA INSTITUTE OF TECHNOLOGY

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Southern Technical Institute

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Engineering College

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Director of Public Relations

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1955-1956

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CEREMONIES—Zsuffa, Curren, Stokes, H. Moore, Lehrer (2), Vail (3).

LIBRARIES—Crosland, Marshall (1), Stiemke (2), Bellinger (3).

PUBLICATIONS—Vidosic (1), Gilman (2), K. Murphy (3), Crosland, Zsuffa.

PUBLIC RELATIONS—Zsuffa, H. Baker, A. D. Holland (1), H. C. Brown (2), C. H. Taylor (3).

STATE RESIDENCE—Anthony, Griffin, Carmichael.

STATUTES—A. J. Walker (2), Carmichael, Bragg (1), Topp (1), D. W. Fraser (2), Bailey (3).

STUDENT LOANS—Anthony, Pershing, Griffin.

TENURE & ADVANCEMENT—P. Weber, Mason, Hefner, Calaway, Bellinger (1), Kindsvater (1), Spicer (2), J. L. Taylor (2), Sisk (3).

STUDENT LECTURE & ENTERTAINMENT—Scharf (1), Pretz (3), Herbert, Zsuffa, and four student members.

INFIRMARY—Morris, Griffin, P. Weber, Coleman, L. Henry.

FACULTY COUNCIL—Rainey (1), Dasher (1), Marshall (2), Cox (2), Ingols (3), Sugarman (3).

STANDING COMMITTEES OF THE ACADEMIC SENATE

1955-1956

ADMISSION—Carmichael, Hefner, Bortell (2), Lehrer (3).

CURRICULUM—P. Weber, Mason, Hefner, Carmichael, Ingols (1), Stiemke (2), Wyly (3), Goglia (3).

EXECUTIVE—P. Weber, Griffin, Hefner, Mason, Carmichael,*Buckingham (1), Garrett (2), Ziegler (3).

GUIDANCE & TESTING—J. E. Moore, Narmore, Griffin, Hefner, Mason, Carmichael, Folk, Commander, Moder (1), Herreman (2), Rainey (3).

HONORS & PRIZES—Carmichael, D. Jones (1), Haman (2), Paquette (3).

PROFESSIONAL DEGREES—Mason, P. Weber, Carmichael, and Directors of Engineering Schools.

STUDENTS GRANTS-IN-AID & SCHOLARSHIPS—Griffin, Anthony, Fulmer (1), Prosser (2), Narmore (3).

STANDING—P. Weber, Mason, Hefner, Griffin (non-voting).

STUDENT ACTIVITIES—Griffin, Zsuffa, J. L. Taylor (1), Almon (2), Flinn (3), Student Representatives.

STUDENT RULES & REGULATIONS—Cox (1), Warren (2), Ward (3), Griffin, Carmichael.

STUDENT-FACULTY HONOR—F. M. Hill (1), Hendricks (2), Sweeney (3), and three student members.

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1955-1956

EMPLOYEE TRAINING—Cox, Jenkins, F. Wilson, Quigley.

FOREIGN STUDENTS—Woodward, Wright, Folk, Pershing, Sturgis.

INSTRUCTION MANUAL—Sweigert, L. V. Johnson, Rainey, Sisk.

INSURANCE—Groseclose, Cox, Marshall, Starrett.

PARKING—Anthony, Cox, Jenkins, G. C. Griffin.

RESEARCH—Weber, P., Calaway, Sweigert, Mason, Hefner, Ingols.

SAFETY & FIRE PROTECTION—Cox, Groseclose, Jenkins.

SKILES COMMITTEE—Crosland, Bortell, G. C. Griffin.

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Nurse

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(As of April 1, 1955)

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Professional engineers among the faculty are indicated with the authorized abbreviation of P.E. followed by the name of the state in which registered.

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———*———

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*On leave
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R. J. THIESEN, B.S. in E.E. (Georgia Institute of Technology), P.E. (Georgia)
Executive Secretary of the Georgia Tech Foundation

FRANK A. THOMAS, JR., B.S. in M.E., M.S in M.E. (Georgia Institute of Technology), P.E. (Georgia)
Assistant Professor of Mechanical Engineering

SIDNEY S. THOMAS, B.B.A., A.B. in Library Science, M.A. (University of Georgia)
Acquisitions Librarian

SAMUEL THOMPSON, A.B., A.M., LL.B., Ph.D. (University of North Carolina)
Associate Professor of Industrial Management

*On leave

THEODORE A. TINDEL, B.S., B.Arch. (Georgia Institute of Technology) P.E. (Georgia)
Part-time Instructor in Architecture

*CHARLES WILDERS TOPE, A.B., M.S. (Georgia Institute of Technology)
Assistant Professor of Physics

ALLAN C. TOPP, Ph.D. (McGill University, Montreal, P. Q.)
Associate Professor of Chemistry

A. T. TRIMBLE, JR., Ph.D. (University of Wisconsin)
Assistant Professor of Chemistry and Research Associate, Engineering Experiment Station

RICHARD ADELBERT TROTTER, B.S. in M.E., M.S. in M.E., M.E. (University of Wisconsin), P.E. (Georgia)
Associate Professor of Mechanical Engineering

RAYMOND N. TROWBRIDGE, B.S. in M.E., M.A. (Columbia University)
Associate Professor of Safety Engineering

JOHN E. TSOUDEROS, Ph.D. (University of Minnesota)
Assistant Professor of Social Sciences

MRS. BLANCHE B. TURNER
Registrar, Engineering Extension Division

A. G. URBAN, B.S. in Chem. (University of Chattanooga)
Assistant in Football

JOHN RICH VAIL, B.S., M.A. (University of Michigan)
Assistant Professor of Mathematics

BLAKE RAGSDALE VAN LEER, M.E., Sc.D. (Washington and Jefferson College), Eng.D (Purdue University), P.E. (Georgia, Florida and North Carolina)
President

JOSEPH PAUL VIDOSIC, Ph.D. (Purdue University), P.E. (Georgia)
Professor of Mechanical Engineering and Research Associate, Engineering Experiment Station

KENNETH C. WAGNER, Ph.D. (University of North Carolina)
Assistant Professor of Social Sciences and Research Associate, Engineering Experiment Station

JAMES H. WAHAB, Ph.D. (University of North Carolina)
Associate Professor of Mathematics and Research Associate, Engineering Experiment Station

SHELBY L. WALCH, A.B., M.A. in Psychology (University of Oregon)
Director of Counseling and Guidance

ANDREW J. WALKER, Ph.D. (Harvard University)
Professor and Head of the Department of English

GEORGE FULLER WALKER, II, B.S., A.B., M.A. (Vanderbilt University)
Associate Professor of Modern Languages

GAINES W. WALTER, Ph.D. (Yale University)
Lecturer in Social Sciences

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*On leave.

JOHN M. WALLACE, JR., B.E.E. (Rensselaer Polytechnic Institute)
Instructor in Electrical Engineering

ROBERT B. WALLACE, JR., B.S. in I.M. (Georgia Institute of Technology)
Editor, Georgia Tech Alumnus

HENDERSON C. WARD, Ph.D. (Georgia Institute of Technology)
Associate Professor of Chemical Engineering and Research Associate, Engineering Experiment Station

NOAH WARREN, B.S., M.A. (Emory University), C.P.A.
Professor of Industrial Management

THOMAS L. WEATHERLY, Ph.D. (Ohio State University)
Associate Professor of Physics and Research Associate, Engineering Experiment Station

HOMER S. WEBER, Ph.D. (Stanford University), P.E. (Georgia)
Professor and Director of the School of Mechanical Engineering

PAUL WEBER, Ph.D. (Purdue University), P.E. (Georgia)
Professor and Director of the School of Chemical Engineering and Research Associate, Engineering Experiment Station

LYLE WELSER, B.S. and M.Ed. (Springfield College)
Professor of Physical Training

FRED B. WENN, B.C.S., M.A. (Emory University)
Professor of Industrial Management

EDWARD R. WESTON, B.S. in E.E., M.S. in E.E. (University of Michigan), P.E. (Pennsylvania)
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R. D. WETHERINGTON, B.S., M.S. (Georgia Institute of Technology)
Assistant Professor (Research Physicist) Engineering Experiment Station

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Assistant Professor of Mechanical Engineering

ARTHUR R. WHITE, JR., B. S. in C.E., M.S. in C.E. (Georgia Institute of Technology)
Assistant Professor of Civil Engineering

THOMAS M. WHITE, B. of E.E., M.S. in E.E. (Georgia Institute of Technology)
Assistant Professor of Electrical Engineering

WYATT CARR WHITLEY, Ph.D. (University of Wisconsin)
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V. R. WIDERQUIST, B.S., M.S. (Georgia Institute of Technology)
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RICHARD WIEGAND, B.A., M.A. (University of North Carolina)
Assistant Professor of English

WILLARD E. WIGHT, M.A. (Emory University)
Lecturer in Social Sciences

O. B. WIKE, B.S., M.S. (University of Georgia)
Assistant Professor of Physics

IRA E. WILKS, B.S. in General Engineering (Georgia Institute of Technology)
Instructor in Engineering Drawing and Mechanics

J. QUITMAN WILLIAMS, M.S., Ph.D. (Duke University)
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TATTIE MAE WILLIAMS, B.A., Master of Librarianship (Emory University)
Science-Technology Librarian

BENJAMIN C. WILLIS (Lt. Colonel, USAF) B.S. (University of Kentucky)
Assistant Professor of Air Science

SAMUEL M. WILLIS, B.S. in Textiles (Clemson College)
Instructor in Textile Engineering and Research Associate, Engineering Experiment Station

RALPH A. WILLOUGHBY, Ph.D. (University of California)
Associate Professor of Mathematics

FRANK B. WILSON, B.S. (Georgia Institute of Technology)
Purchasing Agent and Coordinator of Housing

JACK C. WILSON, B.E.E. (Georgia Institute of Technology)
Instructor in Electrical Engineering

RICHARD WILSON, A.A. Dpl. (Architectural Assn., School of Architecture, London), Reg. Arch. (Assoc. Royal Institute British Architects)
Associate Professor of Architecture

JAMES GORDON WOHLFORD, M.S. (Stanford University)
Director of the Co-operative Division

LEWIS C. WOODRUFF, B.S. (University of Georgia)
Assistant in Football

LEROY A. WOODWARD, B.S., M.S. (University of Michigan)
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NORMAN L. WORRELL, B.A. (George Peabody College for Teachers)
Instructor in Industrial Design

JAMES DIXON WRIGHT, A.B., M.A., Ph.D. (University of Wisconsin)
Professor and Head of the Department of Modern Languages

W. W. WRIGHT, B.A., M.S. (Georgia Institute of Technology)
Special Research Engineer, Engineering Experiment Station

W. B. WRIGLEY, B.S., M.S. (Georgia Institute of Technology)
Special Research Engineer, Engineering Experiment Station

BENJAMIN BLACKISTON WROTH, Ph.D. (Johns Hopkins University)
Professor and Acting Director, School of Chemistry

HUGH ALLEN WYCKOFF, B.S., M.S. (University of Chicago)
Professor and Head of the Department of Public Health and Biology

L. DAVID WYLY, JR., Ph.D. (Yale University)
Professor of Physics

CHARLES FELIX WYSONG, B.S. in Cer. Engrg. (Georgia Institute of Technology), P.E. (Georgia)
Assistant Professor of Ceramic Engineering

GUY A. YORK, A.B., M.A. (University of North Carolina)
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HAYDEN ZIMMERMAN, B.S. and M.S. in M.E. (University of Kansas), P.E. (Georgia)
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LESLIE F. ZSUFFA, B.S. in M.E., M.B.A., M.E. (New York University), P.E. (Georgia and New York)
Director of Public Relations

LEO J. ZUBER, A.B., M.A. (University of Michigan)
Part-time Visiting Lecturer in City Planning

*On leave

GENERAL INFORMATION

Historical Sketch

On November 24, 1882, the General Assembly passed a resolution, introduced by Honorable N. E. Harris, to consider the establishment of a technical school in Georgia. A commission of ten was appointed to visit the leading engineering institutions of the country, and in 1885 the law was passed appropriating $65,000 for the institution. In January, 1886, the first commission was appointed, consisting of Honorable N. E. Harris, S. N. Inman, O. S. Porter, E. R. Hodgson and Columbus Heard. Five places, Athens, Atlanta, Macon, Milledgeville and Penfield, offered bids for the new school, and on October 20, 1886, Atlanta was chosen as the location. Professor M. P. Higgins of the Worcester Institute was secured to supervise the new work, and on October 7, 1888, the installation ceremonies were held at the Opera House in Atlanta.

Campus

Five acres were purchased initially from the Peters Land Company. Later, Mr. Richard Peters donated four additional acres. The campus has been increased by purchase and gifts from time to time until now it comprises 134 acres, of which 92 acres were acquired since July 1, 1944, when Dr. Blake R. Van Leer became President. On the inside back cover is a map showing the campus as it appears today. As of June 30, 1954, the complete plant was valued as follows:

Plant in Use

Buildings		
Academic	$ 4,352,415.94	
Athletic	71,500.00	
Infirmary	38,726.04	
Residential	158,257.58	
Auxiliary	5,032,849.21	$9,653,748.77
Land		1,327,068.95
Equipment		6,500,666.38
Improvements Other Than Buildings		2,056,318.58
Plant Under Lease		
[1]Techwood Dormitory	250,000.00	
[2]Naval Air Station	1,319,000.00	
[3]Architectural Building	1,089,000.00	
[3]Price Gilbert Library	1,840,783.00	5,379,166.00
Value of Plant in Use		$24,916,968.68

Leased from:
[1]Federal Public Housing Authority.
[2]U. S. Navy.
[3]University System Building Authority.

Gifts

Part of several of the above buildings and much of the machinery and apparatus have been given by generous friends. Some of these are the Knowles and Swann Buildings, the A. French Building, Electrical Engineering Building, Lyman Hall Laboratory of Chemistry, Carnegie Building, Y. M. C. A. Building, Grant Field and Stadium, the Joseph Brown Whitehead Memorial Hospital, and the Physics Building, toward which the Carnegie Corporation made an appropriation of $150,000; the remainder of the $200,000 expended upon this structure was received from the Alumni and friends of the school through subscriptions to the Greater Tech Campaign Fund of 1920-22. By will, Honorable Julius L. Brown left two-thirds of his estate to the school which when realized amounted to $187,473. Mrs. Josephine Cloudman left the residue of her estate to the endowment fund in the amount of $82,979. In 1930, the Guggenheim Board gave $300,000 for the establishment of a Department of Aeronautical Engineering at Georgia Tech. In addition generous friends have contributed loan funds to help needy students, as shown under Scholarships and Prizes. George W. Harrison, Jr., left by will $16,000 which is invested in the purchase of two lots near the campus and in improvement of the Ceramic Building. Almost 75 acres have been added to the campus through the purchase of land with funds realized through the operation of Radio Station WGST, which was given to the school in 1923 by Clark Howell and the Atlanta Constitution Publishing Company. Lawrence Wood Robert, Jr., '07, donated land valued at $60,000 to the school in 1946, to be used as part of the site for the proposed Student Activities Building.

Equipment for processing cotton, rayon, wool and synthetic fibres at a cost of approximately $350,000 for use in the new Hightower Textile Building was provided through the generosity of The Textile Education Foundation, Inc. The late Justice S. Price Gilbert made funds available for plans and furnishings of the new Price Gilbert Library.

The Georgia Tech Foundation (see page 265) a non-profit organization, has been the medium through which substantial contributions and gifts have been made to the Georgia Institute of Technology for purchase of modern scientific equipment and for assistance in research and education. Through June 1953, this financial assistance since the organization of the Foundation in 1932 amounted to $424,207. The A. C. Network Calculator was donated through the Foundation by the Georgia Power Company for the use of Georgia Tech.

The Rich Electronic Computer Center is now under construction and should be in operation by the first of 1956. This million-dollar installation was made possible by an initial grant of $85,000 from the Rich Foundation. An additional $85,000 was given by the Georgia Tech Research Institute. A sum of $170,000 was made available for the building by the University System Building Authority upon the approval of the Board of Regents. A medium-size computer was given by the National Cash Register Co. and a large-size computer was obtained through Remington-Rand, Inc.

PRESIDENTS AND TRUSTEES

Dr. I. S. Hopkins was the first President of the Georgia Institute of Technology. Previously the President of Emory College, he had established there the first shop for technical training of college men in this state, and was chosen by the Trustees to assume the important responsibility of directing the newly established engineering college. During his administration the present academic building, one of Atlanta's landmarks, was built.

Dr. Lyman Hall, Professor of Mathematics at the School, and a graduate of West Point, succeeded Doctor Hopkins in 1896. A dormitory structure, Knowles Dormitory, was added to the plant of the new college during Doctor Hall's term of service, as well as the old Textile Building, Swann Hall, Electrical Building, and other buildings. Doctor Hopkins and Doctor Hall laid the foundation for the sound development of the school, and at the time of Doctor Hall's death in 1905, it had attained an assured standing.

Dr. K. G. Matheson, who at the time was Professor of English, was elected by the Trustees to succeed Doctor Hall. Doctor Matheson continued as President until April 1, 1922, when he resigned to become President of Drexel Institute in Philadelphia. The principal additions to the campus during Doctor Matheson's incumbency were the Lyman Hall Chemical Laboratory, the present Carnegie Building, the Whitehead Memorial Hospital, the Y. M. C. A. Building, Power Plant, and the Mechanical Engineering Building. Under Doctor Matheson the college expanded rapidly and acquired its national reputation as an engineering school of the first rank.

Dr. Marion Luther Brittain became President on August 1, 1922, after Dr. N. P. Pratt, Chairman of the Executive Committee of the Board of Trustees, served as Administrator Executive Ad Interim for four months. During Doctor Brittain's administration, 22 buildings were added to the physical plant of the school, and enrollment in collegiate courses increased from 1673 in 1921 to 2910 in the fall of 1941. Upon his retirement in 1944, the Board of Regents honored him with the title of President-Emeritus.

Dr. Blake Ragsdale Van Leer was appointed by the Board of Regents as President on July 1, 1944. During his administration, the full-time student body has gone over 6,000; the campus area more than tripled; three new residence halls and eight apartment houses costing $4,000,000 built; the West Stands of Grant Field rebuilt; a $300,000 A.C. Network Calculator Laboratory was put into operation; a $1,025,000 building for the A. French Textile School was completed; the Bradley Building added to the College Inn; and a new wing to the Hinman Research Building dedicated. A completely modern five-story architecture building was completed in 1952, and the Price Gilbert Library dedicated in November, 1953. Under Doctor Van Leer's able leadership, the Institute is now the largest engineering institution in the South and the third largest in the nation.

Governor N. E. Harris served as chairman of the Board of Trustees until his death, September 21, 1929. Other trustees besides the four

already mentioned on the first commission who have rendered service are D. N. Speer, W. B. Miles, George Winship, George W. Parrott, Walter M. Kelley, N. P. Pratt, Hal G. Nowell, E. R. Hodgson, Sr., and Jr., George G. Crawford, L. W. Robert, Jr., Floyd Furlow, E. R. Black, Harrison J. Baldwin, J. S. Akers, John W. Grant, George H. Carswell, W. H. Glenn, John H. Porter, Frank Freeman, G. M. Stout, Harrison Hightower and John S. Cohen. On January 1, 1952, all State Boards of Georgia State Colleges were abolished and a Board of Regents for the entire University was appointed. See page 5.

DEGREES

The Georgia Institute of Technology at present offers curricula leading to the following degrees which are shown in the order of the establishment of the school in which the work is given:

Undergraduate Degrees

Bachelor of Mechanical Engineering
Bachelor of Electrical Engineering
Bachelor of Civil Engineering
Bachelor of Textile Engineering
Bachelor of Science in Textiles
Bachelor of Chemical Engineering
Bachelor of Science in Chemistry
Bachelor of Architecture
Bachelor of Science (Architecture)
Bachelor of Ceramic Engineering
Bachelor of Aeronautical Engineering
Bachelor of Science in Industrial Management
Bachelor of Science in Physics
Bachelor of Industrial Engineering
Bachelor of Science in Applied Mathematics

To graduates who have completed their courses under the Cooperative Plan, the degree is awarded with the designation "Cooperative Plan."

Graduate Degrees

The degree of Master of Science (with or without designation) is offered in all fields shown above (with the exception of Architecture) and also in:

Engineering Mechanics
Public Health
Public Health Engineering
Sanitary Engineering

Also offered are the degrees:

Master of Architecture
Master of City Planning

The degree of Doctor of Philosophy is offered in:

Chemical Engineering
Chemistry
Electrical Engineering
Physics

GENERAL REGULATIONS

The Georgia Institute of Technology operates on the quarter plan with the fall, winter, and spring quarters normally constituting the academic year. A summer quarter is also offered and many students accelerate their program by attending four quarters per year. The requirements for a degree may be completed at the end of any quarter, although only one annual commencement is held.

Courses are offered in Aeronautical, Ceramic, Chemical, Civil, Electrical, Industrial, Mechanical, and Textile Engineering; Applied Mathematics; Architecture; Chemistry; Physics; Industrial Management; and Textiles. The curricula in these various fields are listed on the following pages and work submitted for credit must be checked against these basic requirements.

ENTRANCE REQUIREMENTS

An applicant may be admitted to the freshman class by certificate under the following conditions:

(1) He must have graduated from an accredited school with a record high enough to indicate that he is prepared for college work.

(2) He must meet the requirements in units as shown below.

(3) He must be at least sixteen years of age.

The institution reserves the right to reject or require further preparation or entrance examinations of any applicant whose record indicates that he is not adequately prepared for college work.

Those who have attended a college or other educational institution since graduation from preparatory or high school must present a record of such attendance with the credits received. See *Admission with Advanced Standing.*

SPECIFIED OR REQUIRED UNITS

English	3	History	1
Algebra	2	Science	2*
Plane Geometry	1	Optional Units at least	6

OPTIONAL UNITS

English	1	Chemistry	½ to 1
Sol. Geometry	½	Gen. Science	½ to 1
Trigonometry	½	Physics	½ to 1
Adv. Algebra	½	Physiology	½ to 1
His. and Civics	1 to 3	Drawing	½ to 2
Economics	½ to 3	Commerce	1 to 3
Latin or Greek	1 to 4	Shop Work	½ to 2
Ger., French or Span	2 to 4	Agriculture	1 to 2
Biology	½ to 1	Military	½ to 1

Ordinarily not more than three units will be allowed from the group including drawing, commerce, agriculture, military and shop work.

*General science, biology, chemistry, physics, etc.

Special attention is called to the required units in algebra, and it is urged that students have a good working knowledge of all mathematics required for entrance. It frequently happens that members of the freshman class must be turned back to review their foundation work in algebra. During the last half year of the high school course the prospective engineering freshman should be given a thorough review of simplifications, exponents, radicals and equations. Such a review will be of great value and may prevent discouragement and failure in college work.

CERTIFICATES FOR ADMISSION

1. Any resident of Georgia applying for admission to an institution of the University System of Georgia shall be required to submit certificates from two citizens of Georgia, alumni of the institution that he desires to attend, on prescribed forms, which shall certify that each of such alumni is personally acquainted with the applicant, that he is of good moral character, bears a good reputation in the community in which he resides, and, in the opinion of such alumnus, is a fit and suitable person for admission to the institution and able to pursue successfully the courses of study offered by the institution he desires to attend.

Each such applicant shall also submit a certificate from the Ordinary or Clerk of the Superior Court of the county in which the applicant resides that such applicant is a bona fide resident of such county, is of good moral character and bears a good reputation in the community in which he resides.

2. Any non-resident of the State applying for admission to an institution of the University System of Georgia shall submit a similar certificate from two alumni of the institution that he desires to attend, or from two reputable citizens of the community in which the applicant resides.

Every such applicant shall also submit a certificate from a judge of a court of record of the county, parish or other political sub-division of the State in which he resides that he is a bona fide resident of such county, parish or other political subdivision and a person of good moral character and bears a good reputation in the community in which he resides.

3. There is reserved to every institution of the University System of Georgia the right to require any applicant for admission to take appropriate intelligence and aptitude tests in order that the institution may have information bearing on the applicant's ability to pursue successfully courses of study for which the applicant wishes to enroll and the right to reject any applicant who fails to satisfactorily meet such tests.

ADMISSION BY EXAMINATION

An applicant with fifteen or more units or their equivalent who is not eligible for admission by certificate but whose general record is approved may qualify for admission by passing qualifying examinations in English, advanced algebra, plane geometry, and physics, or by satisfactorily completing remedial and refresher courses in these subjects.

Entrance examinations are normally held on the campus preceding the registration period in September. Applicants who have been granted permission to take entrance examinations may make special arrangements, if necessary, to take the examinations under the supervision of the principal at their local high schools.

ADMISSION WITH ADVANCED STANDING

Applicants who have made satisfactory records in scholarship and in conduct at other colleges or in service schools may enter with advanced standing provided the subjects satisfactorily passed cover in time and content certain of the required subjects in the courses they expect to enter at Georgia Institute of Technology. No definite statement of advanced standing can be given until an official transcript of record is received from the proper authority or official.

1. *College Work.* The student should request the registrar of the college which he has previously attended to send a transcript to Georgia Tech for appraisal and evaluation. Courses completed over ten years in the past are not transferable except by examination.

2. *The Armed Forces Institute.* The Georgia Institute of Technology does not give courses by correspondence nor has it been its policy to grant credit for correspondence work except by examination. It is suggested that the entering student request the Armed Forces Institute to send a transcript of credit to Georgia Tech where a record will be maintained. It may be necessary for the student to take an examination in such subjects in order to apply credit toward a degree.

3. *Training in Service.* Any veteran, who believes that he has received training in fields which may be the equivalent of college work, may apply to the Armed Forces Institute for a form on which to file a request for a Report of Educational Achievement. When the report is filed at Georgia Tech, the registrar will determine what, if any, college credit can be granted. In addition, the veteran should file with the Registrar's Office an application for admission and request the high school or college last attended before entering the service to send an official statement of the record there. This will establish a basis for considering the applicant for admission to the Georgia Institute of Technology.

ADMISSION OF WOMEN

By action of the Board of Regents, April 9, 1952, women were ruled eligible for admission in the schools of engineering and architecture. The requirements for admission and the regulations governing students apply alike to men and women but for certain exceptions listed below.

Physical Examinations. Women students will not take the required physical examinations on the campus. Instead they will be sent a form to be completed by their family physician.

Physical Training. Women students will not be required to schedule physical training and will not have to make up the credit hours.

ROTC. Women students will be exempted from taking ROTC but will have to make up twelve quarter hours in other subjects.

Dormitory Accommodations. A limited number of women students will be accommodated in a women's residence hall supervised by a housemother. Information about cost and other details is available from the Housing Office.

VETERANS' PROGRAM

Congress has passed four bills and amendments which specifically affect college training of the discharged veteran. Any veteran regardless of age who has served ninety days or more in any branch of the services exclusive of the Army and Navy College Training Programs during the emergencies, and who has received an honorable discharge is automatically eligible for the school or college program.

Two of these bills (Public Law 16 and Public Law 894) as amended, provide for the rehabilitation and training of disabled veterans. The subsistence allowance under these bills is determined by the Veterans Administration in accordance to the pension and dependency status of the individual veteran. Veterans who seek the benefits of these bills must apply directly to the nearest Veterans Administration Office.

Another bill (Public Law 346) as amended, is the so-called "G. I. Bill of Rights" which basically provides that any veteran who can meet certain requirements may receive a minimum of one year's training at government expense. In addition to paying $500 per school year towards the cost of tuition, books and supplies, the government will make a monthly allowance for subsistence of $75 if single; if married $105; or $120 if more than one dependent. For veterans who have been in service for more than three months, the minimum training of one year may be extended by as many months as the veteran has served, up to a maximum of 48 months of training.

Another bill, commonly called "the Korean Bill of Rights" (Public Law 550), is also now in operation for eligible veterans. Under the terms of this veteran's program, the government pays all money directly to the veteran, and the veteran pays his tuition, books and supplies directly to the college. The money paid to the veteran by the Veterans Administration is $110 if single; $135 if married; or $160 if more than one dependent. The veteran who is a resident of Georgia will pay resident fee costs, and the veteran who is a resident of another state will pay non-resident fee costs (see section on Tuition and Fees).

Any veteran desiring to further his education under veterans benefits at the Georgia Institute of Technology should complete the following separate and independent forms promptly:

1. To Georgia Tech:

   a. An official transcript of his academic record at any other college or university he may have attended prior to entry upon active service.

b. A certificate of record and recommendation (blank obtainable from the Georgia Tech Registrar's Office) from his high school if he did not go to college.

c. A formal application for admission to Georgia Tech (blank obtainable from the Registrar's Office).

d. A complete statement of academic and military training (see above section on Admission with Advanced Standing) while in military or naval service.

e. If a former Georgia Tech student, a formal application for readmission (blank obtainable from Registrar's Office).

2. To Veterans Administration:

a. An application under Public Law 16 or Public Law 894 (disabled veterans bills), Public Law 346 (G. I. Bill of Rights), or Public Law 550 (Korean Bill of Rights), complete with photostatic copies of separation papers. These should be taken to the local Veterans Administration Office.

b. A public record copy of marriage in the case of a married veteran. This evidence may be obtained from the courthouse in the county where married. In case of children, a public record copy of birth of one child is also necessary. This may be obtained from the Bureau of Vital Statistics of the Health Department in the state where the child was born.

The Veterans Administration will issue to the veteran a certificate for educational training. The certificate should be brought by the veteran at the time he registers at Georgia Tech and surrendered to the institution on registration day.

The Georgia Institute of Technology is assisting the incoming veteran in his transition from the service to college. On the campus are a Coordinator of Veterans Affairs, and administrative officials to counsel and aid the veteran student.

SPECIAL INFORMATION FOR INTERNATIONAL STUDENTS

Over the years, the Georgia Institute of Technology, more popularly known as Georgia Tech, has been fortunate in having students from countries all over the world. The number of international students enrolled at Georgia Tech is one of the largest of any engineering and scientific college in the United States.

In order for a student from outside the United States to attend Georgia Tech, certain special requirements must be met. These are as follows:

(1) As a student at Georgia Tech, you must have a good, basic knowledge of the English language, both written and spoken, in order to attend the classes which are conducted in English. It is suggested that before coming to Georgia Tech, you study English in your own country or at another school in the United States. If after enrolling at Georgia Tech it is determined by the faculty that you need further training in the language, you will be given an opportunity to broaden your knowledge of the English

language the first two years through special English courses 131, 132, 133, 231, 232 and 233. These courses not only give you extra credit towards graduation but also a greater understanding of American life and ideals.

(2) Make application on or before March first for admission to Georgia Tech for the Fall Quarter as per instructions in this Bulletin. With the application, the student is required to submit official documents covering work taken in high school as well as any taken in a college or university. If accepted, the Registrar will send you a *Letter of Acceptance* bearing the official seal of the Georgia Institute of Technology.

(3) Obtain a passport from your country giving you permission to go abroad.

(4) Make application for a visa at the local office of the American Consul. One of the requirements for such visa is the *Letter of Acceptance* from Georgia Tech. If you are coming as an *Exchange Student,* apply for visa through the agency handling your particular program.

International students, except those with advanced standing, will only be accepted for initial admission to Fall Quarter classes starting in September. A student is eligible for advanced standing if he submits official documents concerning work successfully completed at another college or university.

If there are any other details on which information is desired, please write to:

International Student Advisor
Georgia Institute of Technology
Atlanta, Georgia
U.S.A.

STUDENT BANKING FACILITY

In order to provide a convenient place for the safekeeping of student funds the institution operates a student bank in the Business Office. The operation is similar to the average savings account at commercial banks. Funds may be deposited in this bank by the student or parents and withdrawn as needed by the student. There is a monthly charge of one dollar for this service.

DEFINITION OF LEGAL RESIDENCE

To be considered a legal resident of Georgia for the purpose of registering at the Georgia Institute of Technology, a student must present evidence as follows:

(a) If under 21 years of age, that the supporting parent (or guardian) has been a bona fide resident of the State of Georgia for at least one year next preceding the registration date.

In the event that a legal resident of Georgia is appointed as the guardian of a non-resident minor, such minor does not become a resident until the expiration of one year from the date of appointment, and then only upon proper showing that such appointment was not made to avoid the non-resident fee.

(b) If over 21 years of age, that bona fide residence in the State of Georgia has been established for at least one year next preceding registration and that he is eligible to become a registered voter. No person shall be deemed to have gained or lost residence while a student at the Georgia Institute of Technology. Any time during which a person is enrolled as a student in any educational institution in Georgia may not be counted as a part of the year's residence. Active military assignment in the State of Georgia may not count towards the residence requirement.

TUITION AND FEES

The rates for fees, board and room are subject to change at the end of any quarter.

	Matriculation Fee per Quarter	Tuition Fee per Quarter	Student Activity Fee per Quarter	Medical Fee per Quarter	Total Fees per Quarter	Total Fees per Academic Year
Residents of Georgia	$60.00	none	$9.50	$8.00	$ 77.50	$232.50
Non-Resident Cooperative Students	60.00	$ 81.50	9.50	8.00	159.00	varies
Non-Residents of Georgia	60.00	128.00	9.50	8.00	205.50	616.50

NOTE: (a) Matriculation, tuition, student activity and medical fees of veterans enrolled under PL 16 and PL 346 are paid by the Veterans Administration in accordance with the terms of those laws.

(b) An extra fee may be charged in special courses.

SUMMARY OF EXPENSES

(Estimated for Academic Year)

	Resident of Georgia	Non-Resident Cooperative Student Two Quarters	Non-Resident of Georgia
Matriculation, Tuition and Fees	$ 232.50	$ 318.00	$ 616.50
Board, Room, and Laundry	800.00	600.00	800.00
R. O. T. C. Uniform (if required)	60.00	60.00	60.00
Books and Equipment	100.00	100.00	100.00
Total for Academic Year	$1,192.50	$1,078.00	$1,576.50

OTHER FEES

Each member of the Senior Class must pay a diploma fee of $5.00 before graduating.

Examinations at other than regular examination times will be granted in exceptional cases only and by Faculty action. A fee of $2.00 will be charged in all such cases.

A LATE REGISTRATION FEE OF NOT MORE THAN SIXTEEN DOLLARS ($16.00) IS CHARGED AT THE RATE OF TEN DOLLARS ($10.00) FOR THE FIRST DAY AFTER REGULAR REGISTRATION, AND AN ADDITIONAL TWO DOLLARS ($2.00) FOR EACH OF THE NEXT THREE DAYS.

REFUND OF FEES

Refunds of tuition and other educational fees may be made only upon written application for withdrawal. Student activity and medical fees are not refundable.

Students who formally withdraw during one week following the scheduled registration date are entitled to a refund of 80% of the fees paid for that quarter.

Students who formally withdraw during the period between one and two weeks after the scheduled registration date are entitled to a refund of 60% of the fees paid for that quarter.

Students who formally withdraw during the period between two and three weeks after the scheduled registration date are entitled to a refund of 40% of the fees paid for that quarter.

Students who formally withdraw during the period between three and four weeks after the scheduled registration date are entitled to a refund of 20% of the fees paid for that quarter.

Students who withdraw after a period of four weeks has elapsed from the scheduled registration date will be entitled to no refund of any part of fees paid for that quarter.

AUTOMOBILES AND MOTORCYCLES

No freshman living on the campus may operate an automobile or motorcycle. Exceptions can be made by the Dean of Students in cases of extreme hardship.

All students who operate such vehicles must register them with the Dean of Students. It is considered inadvisable for any student to own a motor vehible unless it is absolutely necessary for transportation to and from school, or for employment.

PHYSICAL EXAMINATIONS

A complete medical history and physical examination is compulsory for each student. Examinations will be given after arrival on campus. Arrangements will be made to have a chest x-ray made, without cost to the student, shortly after matriculation. At the time of his physical examination each student will be responsible for declaring any handicap for which he wishes consideration in his military and physical training program. Each student should be prepared at the time of his physical examination to give information as to his medical history as follows: (1) usual childhood diseases, (2) injuries, (to include location on the body and when the injury occurred), (3) operations, (4) chronic diseases or allergies, (such as asthma, hay fever, sinus trouble), and (5) if he has consulted a physician during the past five years for other than check-ups, giving dates with diagnosis.

ROTC

All freshmen and sophomores, except aliens, veterans under G. I. Bill of Rights and other veterans with at least 12 months service since August, 1947, and those physically unfit, are required to complete the basic Military, Naval or Air training on a college level. Successful completion of the course is a prerequisite to graduation. Students transferring from an accredited college with at least eighty (80) quarter credit hours are not required to pursue Military, Naval, or Air training. Students transferring to this institution with Sophomore standing are required to take one year of ROTC and may elect a second year if desired. Newly entering students in Army and Air ROTC are required to purchase a new uniform from Georgia Tech.

Students who have successfully completed the basic course on a college level (senior division) and who are selected, may pursue the advanced course in the junior and senior years. Completion of the advanced course then becomes a requirement for graduation, unless the student is relieved of his contractual obligation by the Department of the Army, Navy, or Air Force.

A student who is exempt from the basic course or any part thereof must elect additional subjects not regularly included in his course and approximating in credit hours the ROTC work from which he is exempt.

For further details regarding the Army ROTC, see page 170 including purchase of a new uniform, the Naval ROTC, see page 185, and for Air ROTC, see page 69.

SELECTIVE SERVICE DEFERMENTS

Any student enrolled at the Georgia Institute of Technology, who is subject to the provisions of the Selective Service Act and who is called for induction during the academic year, is eligible for deferment from induction until the end of his academic year only or until such time as he is dropped from the rolls of the institution if that time is sooner.

A student who is qualified for and enrolled in the ROTC while matriculating at Georgia Tech may be deferred from induction until after his graduation provided he possesses certain qualifications and meets the prescribed requirements. Such an individual, if required to report for active duty, would report as an officer after having received his reserve commission through the ROTC.

RESIDENCE HALL ACCOMMODATIONS

It is the policy of the school to require all single freshmen who do not reside with their parents, near relatives or *bona fide* guardians, to live in the residence halls. This includes pre-freshmen. They are given FIRST priority in making assignments. Assignments to students who have applied for rooms are made in the following order of priority:

1st priority Freshmen and Pre-Freshmen.

2nd priority Foreign Students.

3rd priority Sophomore Veterans.
4th priority Junior Veterans.
5th priority Senior Veterans.
6th priority Sophomore Non-veterans.
7th priority Junior Non-veterans.
8th priority Senior Non-veterans.
9th priority Atlanta Residents.
10th priority Night School Students.

Women students should write to Coordinator of Housing for housing information.

Transfer Students will be placed according to class status as above.

Late Applicants (Applications which are received after the initial assignments are made prior to the beginning of a quarter will be classified according to the above priorities and assignments made as rapidly as cancellations occur).

There are a limited number of rooms reserved for Graduate Students and priority for these is determined by the Graduate Division although the applications should be sent to the Housing Office. This priority is established by date of application although foreign students are usually placed first since it is difficult for them to arrange in advance for rooms off-campus.

It is usually possible to offer accommodations to all students except for the Fall Quarter at which time it is sometimes not possible to go beyond the 7th Priority in the initial assignments. However, after the week of registration it is possible, due to cancellations, to reach all other priorities. The Housing Office will assist in locating temporary housing.

The school facilities provide housing for approximately 1900 students. Most of the rooms accommodate two students each. There are a few three-man rooms and a number of four-man rooms consisting of two connecting rooms. Students are encouraged to indicate their roommate preference, and it is usually possible to grant such requests.

Each student should provide himself with a heavy blanket or comfort, a light blanket, bedspreads, sheets, pillow and pillow cases, towels and a study lamp.

Residence hall regulations prohibit the installation and use of such electrical appliances as hot-plates, toasters, irons, coffee makers, heaters, radio transmitters, etc. The only electrical appliances permitted are electric razors, radios, and clocks.

Students on the Co-operative Plan are assigned to TECHWOOD HALL. The rooms in all dormitories are available to any student according to priority.

Resident Hall accommodations are rented on a quarterly basis, payable in advance *after assignment has been made,* and vary in price as follows: $41.00 in Brown, Cloudman and Harris; $47.00 in Techwood; $53.00 in Howell, Harrison, Glenn, Towers and Smith.

Applications for rooms should be sent to the *Controller*. The Registrar will supply the necessary application blank when the Notification of Acceptance is sent.

The HOUSING OFFICE will send instructions as to shipment of baggage, and other necessary information with the room assignments.

ASSIGNMENTS and receipt for deposit will be sent within two weeks before the beginning of the quarter for which a student is applying.

Assignments for LATE APPLICATIONS will be sent as soon as possible or if not received, may be picked up at the Housing Office upon arrival at Tech.

A $10.00 key and security deposit must be sent with the application for dormitory room. This deposit will be refunded at the end of the school year or at such time when a student may leave school, provided the key is turned in and there is no damage for which a student is responsible.

A receipt for the key and security deposit will be returned to the student with his room assignment. Dormitory keys may be secured at the Key Office in Smith Hall.

Resident Hall rent is payable in advance, *after the assignment is received,* as follows:

(a) On or before the last day of scheduled registration for assignments made *before* the beginning of a quarter, unless otherwise indicated on assignment notice.

(b) Within four (4) days from date the room is assigned when assignment is made *after* the beginning of a quarter.

A penalty fee will be charged for failure to pay rent or *make satisfactory arrangements for delayed payment* on or before the last date due. The penalty fee will be five dollars ($5.00) for the first day following the date due and one dollar ($1.00) for each of the next three days, the total not to exceed eight ($8.00).

Students who fail to pay their room rent, including penalty fees, or fail to *make satisfactory arrangements,* according to the conditions in above paragraphs (a) and (b), will be reported to the Executive Dean for disciplinary action, four days after the deadline stated in the notice of assignment.

APARTMENTS

The school has approximately 425 apartments for married students. These apartments range in size from efficiency to three-bedroom units and in monthly rental from $40.50 to $94.25. Detailed information and the apartment application blanks will be supplied upon request to the Housing Office. It is *not* necessary to be accepted as a student before application may be made. As apartments are vacated they are re-assigned according to the dates on the applications, with veterans being given first priority.

The apartments are divided into two groups, on-campus, and Lawson. While the Lawson Apartments are not as convenient to classes as the campus apartments, they are most desirable for those who plan to attend Georgia Tech on a limited budget and/or for those who have children.

BRITTAIN DINING HALL

There is a voluntary boarding style food service offered at Brittain Dining Hall. This plan was put into operation for the convenience of any student who wishes to insure himself of three balanced meals a day, six days a week. (Sundays and school holidays excluded). Although this is a boarding plan, a rather wide selection of food is offered to take care of normal likes and dislikes.

The cost of this plan is $111.00 per quarter, payable in advance or divided into three installments. Any student signing up to participate in this plan is expected to continue uninterrupted throughout the quarter. *(This price is subject to change as conditions warrant).* This plan begins on the first day of registration. *(The meal plan is not effective during the freshman orientation week.)*

Cafeteria style food service is also offered at Brittain Dining Hall. Here you have a wider choice of foods. The cost of the meal is determined by the items and quantity selected. Meal Coupon Books may be purchased at the Cashier's office at about ten percent saving.

The "T" Room and O.D.K. Room are open for lunch and dinner with restaurant style food service. The cost per meal is slightly higher and state sales tax is charged on all meals. A great many students prefer this added service even though it means added cost.

The students at Georgia Tech are at liberty to choose or reject any of these food services. Brittain Dining Hall is operated by the school on a non-profit basis solely for the benefit and convenience of the students.

It is our hope that whatever your choice—you will choose wisely. The importance of good eating habits will be reflected in your work and play.

OTHER INFORMATION

Reports: Grade reports of students are issued at the close of each quarter.

Class Attendance: Any subject scheduled must be attended throughout the quarter by a student unless this subject is removed from the student's schedule by his College Dean.

Examinations: Final examinations are held at the end of each quarter. Students may be dropped from the roll of their classes at any examination, when they do not meet the requirements, as well as at any time when they neglect their studies and fall hopelessly behind their classes. No fees are refunded under such circumstances.

Constitution Examination: A Georgia law, amended March 4, 1953, requires all students to pass an examination on United States history and constitution and Georgia history and constitution or take comparable courses before graduation. Courses which may be substituted for the examination are S.S. 107 or 323 for United States and Georgia Constitutions; and S.S. 319, 327, or 328 for United States and Georgia history. S.S. 324 satisfies the Georgia history and constitution requirements only.

Limitations on credit for ROTC courses:

Twelve (12) quarter hours in Basic ROTC courses and eighteen (18) quarter hours in Advanced ROTC courses is the maximum credit allowed toward meeting the requirements for any degree.

Marking or Grading System:

The following marking system is now in effect.

A—excellent (4 quality points)

B—good, above average (3 quality points)

C—satisfactory (2 quality points)

D—barely passing (1 quality point)

F—failing, must repeat the subject (no quality points)

S—Credit by transfer, examination for advanced standing, or satisfactory completion of a non-credit course (not included in calculation of scholastic average).

A mark of D is passing in a single subject but a general average of approximately C is required for graduation.

CURRICULA

In the following pages there will be found in alphabetical order a tabulation of the work required for a degree in the courses offered by the Georgia Institute of Technology.

DANIEL GUGGENHEIM SCHOOL OF AERONAUTICS

(Established in 1930)

Director—Donnell W. Dutton; *Associate Professors*—Walter Castles, Jr., A. L. Ducoffe, John J. Harper; *Instructor*—Wesley M. Mann., Jr.; *Graduate Assistant*—Sidney A. Powers; *Secretaries*—Sarah Q. Slaughter and Sara Robison; *Model Maker*—William C. Slocum; *Machinist*—George W. D. Cook.

General Information

The School of Aeronautical Engineering, which is known as the Daniel Guggenheim School of Aeronautics, was established in 1930 through a gift of $300,000 from the Daniel Guggenheim Fund for the promotion of Aeronautics. The purpose of this award was to establish opportunities at the Georgia Institute of Technology for study and research of the highest order in the field of aeronautics.

The continuing progress in the field of jet propulsion, rocket-powered flight and supersonic aircraft make the course in aeronautical engineering especially significant. The ever widening scope of this field, plus the continuing growth in civil and commercial flying and the expansion of the air power concept in the Defense Department, is continually increasing the demand for engineers with aeronautical training.

The number of students accepted as candidates for the Aeronautical Engineering degree is limited. The selection will be made at the beginning of the Junior year.

Two alternatives are offered to qualified applicants.

1. A twelve-quarter curriculum leading to the degree of Bachelor of Aeronautical Engineering, so arranged as to enable the student to qualify in the design and maunfacture and maintenance of aircraft, aeronautical accessories, and air transport equipment. It is usually possible for applicants who already possess the degree of Bachelor of/or Bachelor of Science in Mechanical, General, Electrical or Civil Engineering to complete the additional work toward the degree of Bachelor of Aeronautical Engineering in one additional year if they so desire.

2. Students who have received the degree of Bachelor of/or Bachelor of Science in Aeronautical, General, Mechanical, Electrical, or Civil Engineering may obtain the degree of Master of Science in Aeronautical Engineering by completing a course consisting of intermediate and graduate subjects plus a thesis, the curriculum in each case to be approved by the Committee on Graduate Courses.

This advanced work will prepare the student for research, high level design, or teaching in aeronautics. Most candidates for this degree, and especially those who have not taken undergraduate courses in aeronautics, will find it necessary to spend more than one year in fulfilling the requirements.

EQUIPMENT

The School of Aeronautics is well equipped for offering laboratory work to augment and lend interest to the theoretical courses. Most of this equipment is also suitable for research projects conducted by graduate students and members of the staff.

The School is housed in two buildings; a three-story structure erected in 1930; and a one-story temporary annex, completed in 1947. The principal building contains, in addition to classrooms and offices, a nine-foot wind tunnel, and two and a half foot wind tunnel, an instrument laboratory, a dark room, a large drafting room, and structural exhibit room for the use of design students, and a reference library on aeronautical subjects. The annex houses the School's own machine and wood-working shop, in which all its models and special apparatus for research and routine programs are constructed; an aircraft structural testing laboratory, containing electric strain gauge equipment, a fatigue testing machine, and a special universal testing machine; a supersonic wind tunnel; a water table, low turbulence wind tunnel. In addition, the Mechanical Engineering Department possesses several large aeronautical engines and dynamometer equipment.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Total	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
A.E.	322	Aerodynamics of the Airplane	....	....	3-0-3
Dr.	103	Engineering Drawing	0-6-2	....	....
Dr.	203	Descriptive Geometry	....	0-3-1	....
Eng.	201-2-3	Survey of Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
M.E.	201-2	Machine Laboratory	0-3-1	0-3-1	....
M.E.	205	Welding Laboratory	....	0-3-1	....
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
		Total	16-17-20	16-17-20	19-8-20

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
A.E.	323-4	Aerodynamics of the Airplane.....	3-0-3	3-0-3	....
A.E.	331	Theory of Aircraft Structures I.....	....	....	3-0-3
A.E.	425	Wind Tunnel Laboratory.....	....	....	1-3-2
Ch.E.	325	General Metallurgy	3-0-3	....	....
E.E.	316-7	Applied Electricity	3-0-3	2-3-3	....
E.E.	322	Industrial Electronic Control.....	....	....	3-3-4
Math.	305-6	Differential Equations	3-0-3	3-0-3	....
Math.	420	Vector Analysis	....	....	3-0-3
M.E.	322-3	Thermodynamics	....	3-0-3	3-0-3
Mech.	301-2-3	Applied Mechanics	2-0-2	2-0-2	3-0-3
Mech.	331-2	Mechanics of Materials.....	3-0-3	2-0-2	....
Mech.	304	Applied Mechanics (Graphic Statics	....	0-3-1	....
Electives*		ROTC or Non-Technical.....	3-0-3	3-0-3	3-0-3
		Total	20-0-20	18-6-20	19-6-21

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
A.E.	325	Aero and Hydro Mechanics.....	3-0-3	....	....
A.E.	421	Aerodynamics—Elementary Supersonics	....	3-0-3	....
A.E.	434-5-7	Theory of Aircraft Structures II, III, IV.....	3-0-3	3-3-4	3-3-4
A.E.	440-1	Airplane Design I, II.....	0-9-3	0-9-3	....
A.E.	450	Stability and Control I.....	3-0-3	....	....
A.E.	452	Dynamics of the Airplane I.....	....	....	3-0-3
A.E.	467	Seminar	....	....	1-0-1
A.E.	470	Aircraft Propulsive Systems.....	....	....	3-0-3
Eng.	321	Technical English	3-0-3	....	....
M.E.	446	Aircraft Propulsion Engines.....	....	3-0-3	....
Mech.	421	Mechanical Vibrations	....	3-0-3	....
Electives*		ROTC or Approved Technical.....	3-0-3	3-0-3	6-0-6
		Total	15-9-18	15-12-19	16-3-17

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

A.E. 210. Air Navigation 3-0-3.

Prerequisites: Physics 201 and Math. 102 or equivalent. Staff.

A study of the theory and problems of modern air navigation; position and time in relation to the earth's surface; projections and charts; navigation instruments; applied aerial navigation and radio; problems in applied air navigation including radius of action, off course, alternate airport, interceptor, moving base, radio fix, etc.; theory and use of navigation computers and plotting boards.

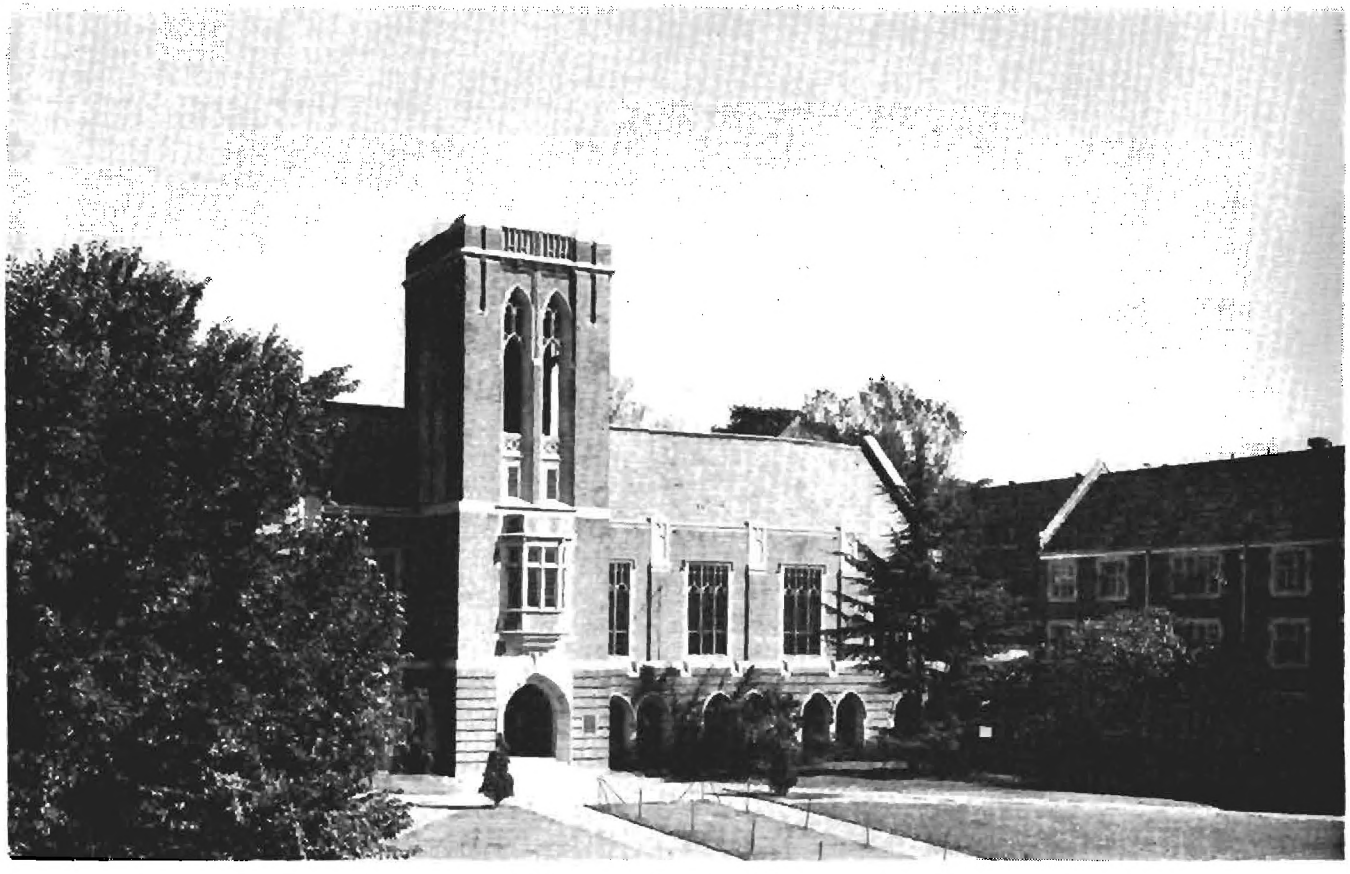
Text: *Lecture notes and Appropriate CAA Bulletins.*

A.E. 215. Meteorology 3-0-3.

Prerequisites: Physics 203, or concurrently, Math. 102 or equivalent. Staff.

Physical properties of the atmosphere; principles involved in the mo-

ADMINISTRATION BUILDING



Brittain Dining Hall

tion of the atmosphere, cyclones, anticyclones and storms, fronts and frontal analysis; stability, air masses, clouds and map study, weather observations and basic principals of weather forecasting.

Text: CAB—25, *Meterology for Pilots.*

A.E. 322. Aerodynamics of the Airplane I 3-0-3.

Prerequisites: Parallel Math. 203 and Physics 209. Mr. Mann

Applied aerodynamics including properties of air, airfoil theory, Reynolds Number, airfoil characteristics, induced drag and downwash, aspect ratio corrections, effects of wing platform, and auxiliary lift devices.

Text: Sherby, Domnasch, and Connoly, *Airplane Aerodynamics.*

A.E. 323. Aerodynamics of the Airplanes II 3-0-3.

Prerequisites: A.E. 322 and Phys. 209; Parallel Math. 305 and Mech. 301. Mr. Harper

Boundary layer theory; scale effect; parasite drag; airplane efficiency factor; momentum and simple blade element theory of propellors, horsepower available and required, performance, take-off and landing runs, ground effect, static longitudinal stability.

Text: Sherby, Domnasch, and Connoly, *Airplane Aerodynamics.*

A.E. 324. Aerodynamics of the Airplane III 3-0-3.

Prerequisites: A.E. 323, Mech. 301, and Math. 305. Mr. Harper

Effects of compressible flow on airfoil coefficients, effect of sweep, gliding flight, terminal velocity, spanwise and chordwise lift distribution, load factors, V-G diagrams.

Text: Sherby, Domnasch, and Connoly, *Airplane Aerodynamics.*

A.E. 325. Aero and Hydro Mechanics 3-0-3.

Prerequisites: A.E. 324, Math. 420. Staff.

Fluid Mechanics, Hydrodynamics, Introduction to compressible and viscious fluids.

Text: Kuethe and Schetzer, *Foundations of Aerodynamics.*

A.E. 331. Theory of Aircraft Structures I 3-0-3.

Prerequisites: Math. 305, Mech. 332, Parallel Mech. 303.
Mr. Mann and Staff.

Basic theory of aircraft structural design including: a review of plane stress and strain theory; loads, shears and moments in wings and fuselages; buckling of columns and thin panels; section properties of aircraft components.

Text: Peery, *Aircraft Structures; ANC-5 Bulletin.*

A.E. 421. Aerodynamics—Elementary Supersonics 3-0-3.

Prerequisite: A.E. 325. Mr. Ducoffe and Staff.

The equations of motion, energy and continuity, thermodynamic principles, one-dimensional flow, Mach waves, shock waves, Prandtl-Meyer flow.

Text: Kuethe and Schetzer, *Foundations of Aerodynamics.*

A.E. 422. Aerodynamics—Perfect Fluids 3-0-3.
Prerequisite: A.E. 325. Mr. Ducoffe and Staff.
Flow about a body; the thin airfoil; finite wing theory.
Text: Kuethe and Schetzer, *Foundations of Aerodynamics.*

A.E. 425. Wind Tunnel Laboratory 1-3-2.
Prerequisites: A.E. 324, Parallel Mech. 303. Mr. Mann and Staff.
Experiments in the 2½ foot wind tunnel including survey of the jet; effect of aspect ratio; static stability; drag by the momentum method; pressure distribution over a wing.
Text: Pope, *Wind Tunnel Testing.*

A.E. 427. Wind Tunnel Design and Techniques 2-0-2.
Prerequisite: A.E. 425. Staff.
Theory and design of wind tunnels and components, proper testing procedure.
Text: Pope, *Wind Tunnel Testing.*

A.E. 434. Theory of Aircraft Structures II 3-0-3.
Prerequisites: A.E. 331, Math. 306. Mr. Dutton and Staff.
Thin metal structural theory including: stressed skin theory as applied to the design of fuselages, wings, spars, and other load-carrying structural members; combined stresses; torsion on single cell and multi-cell sections.
Text: Peery, *Aircraft Structures; ANC-5 Bulletin.*

A.E. 435. Theory of Aircraft Structures III 3-3-4.
Prerequisite: A.E. 434. Mr. Dutton and Staff.
Continuation of thin metal theory including shear center and unsymmetrical bending, combined loads and stresses, tapered sections; design of joints and fittings; work and energy methods and their application to the solution of statically indeterminate problems; correlation of theory with practice by means of laboratory demonstrations.
Texts: Peery, *Aircraft Structures; ANC-5 Bulletin;*
Niles and Newell, *Airplane Structures, Vol. II.*

A.E. 437. Theory of Aircraft Structures IV 3-3-4.
Prerequisites: A.E. 331, Math. 306. Mr. Dutton and Staff.
Energy methods applied to deflection calculations of trusses, beams and other structural members, continuous beams, beam columns. Correlation of theory with practice by experiments in the laboratory.
Texts: Peery, *Aircraft Structures; ANC-5 Bulletin;*
Niles and Newell, *Airplane Structures, Vol. II.*

A.E. 439. Advanced Aircraft Structures 3-0-3.
Prerequisites: A.E. 432 (old) or A.E. 435, or consent of instructor.
Mr. Williams and Staff.
Thin metal structural theory applications to advanced web theory; shear webs with cut-outs; torsion in multi-cell sections by energy methods; torsion on open sections; stress distribution around cut-outs in fuselages, wings and nacelles; miscellaneous thin metal structural problems.
Texts: Perry, *Aircraft Structures; ANC-5 Bulletin;*
Niles and Newell, *Airplane Structures, Vol. II.*

A.E. 440. Airplane Design I 0-9-3.

Prerequisites: A.E. 324, Parallels A.E. 434. Mr. Harper and Staff.

Design of stressed skin type airplane in accordance with the U. S. Civil Aeronautical Administration or air force requirements including a stress analysis for several important loading conditions. Three view, weight and balance, performance report, and structural loading report.

Text: *Lecture notes; CAM 04 and ANC-5a Bulletin.*

A.E. 441. Airplane Design II 0-9-3.

Prerequisite: A.E. 440, Parallels A.E. 435. Mr. Harper and Staff.

Continuation of A.E. 440 to unit and critical loadings on fuselage, wing and other parts of the structure.

Text: *Lecture notes; ANC-5a Bulletin.*

A.E. 442. Airplane Design III 0-9-3.

Prerequisites: A.E. 441, Parallels A.E. 437. Staff.

Continuation of A. E. 441 to a stress of the basic components.

Text: *Lecture notes; ANC-5a Bulletin.*

A.E. 449. Airplane Detail Design 2-3-3.

Prerequisites: A.E. 434, A.E. 440. Mr. Dutton and Staff.

Aeronautical drafting practices; fitting analysis; study of forging and casting design; sheet metal development; preparation of production drawings of small fittings; fatigue; corrosion; life expectancy.

Text: Anderson, *Aircraft Layout and Detail Design.*

A.E. 450. Stability and Control I 3-0-3.

Prerequisites: A.E. 324, Mech. 303, Math. 306. Mr. Harper.

A study of static lateral and longitudinal stability and the effect of these stability characteristics on flying qualities, including neutral point, maneuver point, power effects and estimation of stability derivatives.

Text: Perkins and Hage, *Airplane Performance, Stability and Control.*

A.E. 452. Dynamics of the Airplane I 3-0-3.

Prerequisites: A.E. 450, Mech. 421. Mr. Ducoffe and Staff.

A study of the equations and methods used in the analysis of the dynamic stability of an airplane, and their application to the calculation of the damping characteristics and stability boundaries for a specific airplane.

Text: Perkins and Hage, *Airplane Performance, Stability and Control.*

A.E. 467-468. Seminar 1-0-1.

Prerequisites: A.E. 324, A.E. 440, Eng. 321. Staff.

Scheduled meetings at which individual students present technical papers on important current aeronautical developments, the reading of each paper being followed by group discussion.

Text: *None.*

A.E. 470. Aircraft Propulsive Systems 3-0-3.

Prerequisites: A.E. 325 and A.E. 434. Mr. Castles and Staff.

Study of the various theories used in propellor design, and of the structural requirements of a propellor. Reference is made to the associated problems of jet-engines, wind tunnel fans, and helicopter rotors.

Text: *Lecture Notes.*

GRADUATE COURSES OFFERED

A.E.	621	Elements of Viscous Fluid Theory	3-0-3
A.E.	622	Elements of Compressible Flow Theory	3-0-3
A.E.	623	Theoretical Aerodynamics I	3-0-3
A.E.	624	Theoretical Aerodynamics II	3-0-3
A.E.	630	Elastic Equations of Aircraft Structures	3-0-3
A.E.	631	Advanced Aircraft Structural Analysis I	3-0-3
A.E.	632	Advanced Aircraft Structural Analysis II	3-0-3
A.E.	633	Advanced Aircraft Structural Analysis III	3-0-3
A.E.	659	Applied Vibrations and Flutter	3-0-3
A.E.	676	Aerodynamics of the Helicopter I	3-0-3
A.E.	677	Aerodynamics of the Helicopter II	3-0-3
A.E.	700	Thesis.	
A.E.	701, 702, 703	Seminar	1-0-0
A.E.	720	Dynamics of Perfect Fluids	3-0-3
A.E.	721	Advanced Viscous Flow Theory	3-0-3
A.E.	725	Introduction to Theory of Turbulence	3-0-3
A.E.	726	Advanced Compressible Flow Theory	3-0-3
A.E.	727, 728	Advanced Problems in Aerodynamics	1-6-3
A.E.	746, 747	Advanced Airplane Design Problems	1-6-3

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

DEPARTMENT OF AIR SCIENCE

(Established in 1950)

Commandant and Professor of Air Science—Colonel Hugh C. Moore; *Assistant Professors*—Lieutenant Colonel Benjamin C. Willis, Major Philip G. DeMuro, Major Forest O. McClure, Major Paul Reynolds, Jr., Captain Roy O. Sloan, Jr., Captain Ralph Stephenson, Lieutenant Alfred M. Firth, Lieutenant Walter H. Ott, Lieutenant Lionel V. Patenaude; *Staff*—Master Sergeants Woodrow Spradlin, Burrel C. Yeager, Technical Sergeants Edwin F. Crocker, Murrel C. Davis, Lawrence E. McMahon, Leonard W. Milender, Dewey E. Robinson, William C. Townsend, Staff Sergeant Richard D. Miles. Miss Dolores C. Gibson, Secretary.

Air Force Reserve Officers' Training Corps

The Department of Air Science was established in 1950 to select and prepare students, through a permanent program of instruction, to serve as officers in the Regular and Reserve components of the United States Air Force. The department also assists in discharging the institution's obligation to offer instruction in military training.

The generalized curriculum emphasizes the uniformly high level of military understanding and knowledge required of all junior Air Force officers. Four years are required to complete the course of instruction; two years for the basic course and two for the advanced course. Satisfactory completion of the basic course is a prerequisite for entry into the advanced, except that honorably discharged veterans of six to twelve months service may be given credit for one year of the basic course, and those who have had over one year of service may be given credit for the entire basic course.

The Advanced Course

Enrollment in the advanced course is by selection. Applicants must: (1) be able to fulfill all requirements for a commission prior to their 28th birthday; (2) have two years of academic training remaining in order to obtain a degree; (3) sign a written contract agreeing to complete the course; (4) be a citizen of the United States; (5) pass certain screening tests; (6) pass the officer physical examination; (7) terminate membership (if member) in any Reserve organization other than the Air Force Reserve; and finally (8) be accepted by a board of Air Force officers.

Applicants who are physically qualified for and desire flying training after graduation are preferred. A small number of highly qualified applicants who are pursuing engineering courses of interest to the Air Force are selected as vacancies occur.

Advanced course cadets receive a monetary allowance for subsistence amounting to about $550 dollars for the course. This is in addition to the pay received at summer camp (between the junior and senior year), about $78. Cadets going to camp receive compensation for traveling expenses for the round trip at six cents per mile. Cadets at camp are furnished food, housing, uniform, medical and dental care and $10,000 serviceman's indemnity coverage at Government expense.

Completion of the advanced course, including summer camp and receipt of his college degree makes a cadet eligible for a commission as a second lieutenant in the United States Air Force Reserve.

The advanced course is a recognized elective in all departments at Georgia Tech. Students pursuing the course as an elective receive academic credits.

Uniforms

The Air Force ROTC uniform is identical to the regulation Air Force uniform except for insignia, thus it may be worn on active duty with the Air Force after completion of Air Force ROTC.

A cadet who completes the basic course receives $50 from the Government to reimburse him for purchasing a uniform. He receives $25 after one year, less if not enrolled for a full year. An additional $100 allowance is provided for the advanced course with payment made upon completion of the course.

Newly entering students in the Air Force ROTC are required to purchase a new uniform from Georgia Institute of Technology. The approximate cost for the basic uniform is $58.00 plus a $3 fee. The advanced uniform costs about $81.50 plus a $4.25 fee. Basic cadets must provide themselves with one pair of black low quarter, leather shoes (plain toe).

Texts

Textbooks are furnished by the Air Force. Basic students deposit $3, which is returned at the end of the year or upon notice of discharge or withdrawal from Georgia Tech.

Grading System

Letter grades are awarded as in other departments. However, the grade is not based entirely on classroom recitations, oral or written, but includes aptitude and ability as a leader during leadership laboratory periods. A cadet's potential value as a leader is demonstrated to an important degree by his response to the entire scope of military instruction and military procedure, as portrayed by his interest, conduct, alertness, neatness, attendance and similar related matters. The final quarter grade will be based on evidence of those attributes combined with his academic standing.

Courses of Instruction

Note: 2-2-2 means 2 hours class, 2 hours laboratory, 2 hours credit.

* * *

BASIC COURSE—Air Age Citizenship Education

AIR SCIENCE I—*The Airplane and the Air Age*

A.S. 111—Introduction to Aviation 2-2-2.

Details of the AFROTC program, historical development of aviation and its importance, principles of flight, classification and construction of aircraft are studied. Basic military training laboratory.

A.S. 112—Fundamentals of Global Geography 2-2-2.

A study of World and International Tensions, geographical relationship, characteristics and limitations of map projections, and geographical factors or world political and military power. Basic military training laboratory.

A.S. 113—International Tensions and Security Structures and Military Instruments of National Security 2-2-2

The study of International Tensions is continued for half of the course. Causes of tension and resulting alignments of powers are studied. The evolution and roles of the Armed Forces in the nation's defense structure are examined during the last half of the course. Basic military training laboratory.

AIR SCIENCE II—*Elements and Potentials of Air Power.*

A.S. 211—Elements of Aerial Warfare I 2-2-2

Beginning a year-long study of the elements and potentials of air power. Careers in the Air Force, targets and weapons are the topics studied. Leadership laboratory.

A.S. 212—Elements of Aerial Warfare II 2-2-2.

Weapons continued, followed by aircraft. Leadership of small units in laboratory periods.

A.S. 213—Elements of Aerial Warfare III 2-2-2.

Bases and operations complete the study of elements of aerial warfare. Leadership in small units in laboratory periods.

* * *

ADVANCED COURSE—Air Force Officer Development

AIR SCIENCE III—*The Air Force Officer in the Air Age.*

A.S. 311—The Air Force Commander and His Staff; Creative Problem Solving; Communicating in the Air Force 4-1-3.

Principles of command and staff concepts, steps in problem solving, communications channels, media, and aids are the topics studied. Leadership laboratory training as cadet non-commissioned officer.

A.S. 312—Communicating in the Air Force; The Military Justice System 4-1-3.

Communication continued for over half the course, then basic principles, rules and procedures of military courts and boards. Leadership laboratory continued.

A.S. 313—Air Navigation; Weather; Air Force Base Functions 4-1-3.

Operational factors encountered in flight; and structure of an air base are studied to enable cadets to benefit from Summer Camp. Command positions in leadership laboratory.

AIR SCIENCE IV—*Leadership and Air Power Concepts.*

A.S. 411—Principles of Leadership and Management 4-1-3.

Conducted as a seminar for last half of course, applying principles learned in first half. Cadet officer duties in laboratory period.

A.S. 412—Principles of Leadership and Management; Military Aviation and Evolution of Warfare; and Military Aspects of World Political Geography 4-1-3.

Significance of military aviation as an instrument of warfare; the relationship of geographical factors to national strength and national policy. Cadet officer duties in laboratory period.

A.S. 413—Military Aspects of World Political Geography; Briefing for Commissioned Service 4-1-3.

Geography continues for three-fourths of the quarter. Preparation for active duty as an officer.

SCHOOL OF ARCHITECTURE

Including the Graduate Program in City Planning**

(Established in 1908)

Director—Harold Bush-Brown; *Professors*—Boris W. Boguslavsky, Professor of Structural Design, James H. Gailey, James H. Grady, Paul M. Heffernan, Professor of Architectural Design, Howard K. Menhinick, Regents' Professor of City Planning; *Associate Professors*—Hin Bredendieck, in charge of Industrial Design; David J. Edwards, Jr., Sam T. Hurst, Demetrios A. Polychrone, Richard H. Pretz, Isaac E. Saporta, Richard Wilson, and H. Griffith Edwards (Part-time), Julian H. Harris (Part-time); *Assistant Professors*—Thomas B. A. Godfrey, Malcolm G. Little, Jr., Robert F. Rabun, Geo. W. Ramey, Jr. and Vernon M. Shipley, Jr.; *Instructors*—Rufus R. Greene, Norman L. Worrell, Wesley U. Moran (Part-time), Theodore A. Tindel (Part-time); *Visiting Lecturer*—Lee J. Zuber (Part-time); *Librarian*—Natelle Isley; *Secretaries*—Joan J. Wilkerson, Anita DeLoach; *Part-time Secretaries*—Margaret Mojesky and Lucia F. Pulgram; *Library Assistant*—Martha Rand.

General Information

The Department of Architecture was established as a degree granting department in 1908. In 1934 architecture was made a five-year course; at the same time an option in architectural engineering was established in the senior year.

In 1952, an option in industrial design and graduate programs in architecture and city planning were established.

Four options are now listed herewith under the School of Architecture: Option 1, Architectural Design; Option 2, Structural Design, both leading to the five-year degree—Bachelor of Architecture. Option 3, Industrial Design; Option 4, Light Construction Industry, leading to a four-year degree —Bachelor of Science (without designation).

The original objective and first aim of the School is to prepare students for the profession of architecture; this is served by the Architectural Design Option Number 1. There is also the need for men who will specialize in structure whose field of service may be in architectural offices or closely allied therewith, for which Option Number 2 is offered as preparation. For those who wish to enter the new field of Industrial Design, dealing with the products of industry, specialized courses are offered under Option Number 3. The needs of the building industry are being further provided for by the Light Construction Industry Option Number 4. This is for men who wish to engage in some activity connected with the building industry other than design, such as supervision of construction, home building, or marketing of building materials.

Except for Option 4, courses in design, including the prerequisites and parallel courses in drawing, are of paramount importance and form the central core of the curriculum. It is in these courses that the student is given an opportunity to develop his creative as well as his analytical powers by finding solutions to programs outlining the conditions and requirements of

**For the graduate program in City Planning see Graduate Bulletin.

contemporary problems, such as will be encountered later on in actual practice. This is what is known as the problem method, instruction being generally in the form of guidance and suggestion on the part of the instructor given individually to each student. The solutions submitted in the form of drawings and models are judged, each one on its merits, by a jury of teachers, practicing architects, designers, and specialists on the particular problem being judged.

Closely allied to design and, insofar as possible, integrated with it, are the courses in construction, which, in turn, are dependent on the basic prerequisites of mathematics, physics, and mechanics.

Other fields of professional or technical instruction include history, and mechanical plant, (plumbing, heating, air-conditioning, refrigeration, electrical) office and field practice.

All architectural students who plan to take fifth year work in architecture options No. 1 or No. 2 must pass a comprehensive examination in design before being permitted to enroll in the fifth year work in architecture.

In addition they must have had an uninterrupted three-months period of practical experience either in architectural office or on the job before being permitted to enroll in the fifth year. This requirement, for good cause, may be specifically waived with the consent of the Director of the School of Architecture.

A graduate program is now offered for those students who wish to work for a M.Arch. with major concentration in 1) Design, — 2) Structure, —3) History and (or) —4) architectural aspects of City Planning. Detailed description of graduate courses is found in the Graduate Bulletin, including the newly established two year graduate course in City Planning leading to the degree of M.C.P.

Enrollment

All students entering the School should take interest and aptitude tests.

The National Architectural Accrediting Board has officially accredited the architectural course of the Georgia Institute of Technology leading to the degree of Bachelor of Architecture.

STANDARDS FOR ADVANCEMENT

Eligibility for advancement in design is gauged by a student's attitude, constancy of production, and skill. To insure his success in his chosen field, the School feels it necessary to review the student's work at various stages and to make recommendations in case his record falls below the following minimum standards:

a) Eligibility to begin the design series (Arch. 207) is based in general on the completion of all first year subjects. Specifically, students will be accepted only in case their math is complete, and they lack credit in no more than one term of one other subject.

The only exceptions will be made in the case of transfer students, and all are advised that deficiencies in first year subjects must be made up during the first summer session following their first year of enrollment, if they do not wish to be held back during the regular academic year.

b) Eligibility for Architecture 301—Completion of Sophomore design, Math, and Physics, and a design course average of 2.0. Classes are limited to a maximum of 18 students.

c) Eligibility of Architecture 501 or 546. Completion of Senior Design, a 1.8 general average and a design course average of 2.0. Completion of 3 months practical work in an architect's office or approved construction company, and faculty approval.

d) Eligibility for Architecture 503 or 520-21 (Thesis)—Completion of Architecture 501 and 502 or 520 with a minimum average of 2.0, completion of Architecture 545 or 546 (Thesis Research) and faculty approval.

e) No student shall be enrolled for more than one regular design course during any term. This applies to both day and night school. Students enrolled for credit courses in night school shall follow the same standards for prerequisites and advancement as day school students.

FRESHMAN YEAR

(Uniform for all four options)

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
*Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101	Engineering Drawing	0-6-2	....	....
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Arch.	102-3	Arch. Drawing; Prelim. to Design	....	0-6-2	0-6-2
Math.	101-2-3	Algebra, Trig. and Anal. Geom.	5-0-5	5-0-5	5-0-5
**M.L.		Modern Language OR			
*S.S.	105-6-7	Social Sciences	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	ROTC	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Total	18-14-20	17-14-20	17-14-20

*The student may select any two of Chem., M.L. or S.S.
Chemistry is required for the course in Industrial Design, Opt. No. 3.
**Choice of M.L. 101-2-3, German; M.L. 107-8-9, French, or M.L. 113-14-15, Spanish.

SOPHOMORE YEAR

(Uniform for options 1, 2 and 4)

(For Industrial Design, Opt. 3., See p. 85)

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	201	Introduction to Design	1-0-1	....	....
Arch.	204-5-6	Graphics	1-4-2	1-4-2	1-4-2
Arch.	207-8-9	Design	1-12-5	1-12-5	1-12-5
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2	Calculus	5-0-5	5-0-5	....
Phys.	207	Mechanics	....	....	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Total	14-21-19	13-21-18	13-24-19

JUNIOR YEAR

Architectural Design, Opt. No. 1 and Structural Design Opt. No. 2

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	301-2-3	Design	1-12-5	1-12-5	1-12-5
Arch.	310-11-12	Freehand Drawing	0-3-1	0-3-1	0-3-1
Arch.	322-23-24	Building Materials	2-0-2	2-0-2	2-0-2
Arch.	326-27	Construction: System Selection and Timber Design	3-0-3	....	3-0-3
Arch.	334	History: Ancient	....	....	3-0-3
Mech.	301, 304	Applied Mechanics	2-0-2	0-3-1	....
Mech.	331, 336	Mechanics of Materials	....	3-0-3	3-0-3
Phys.	212, 213	Elementary Electricity; Heat, Sound, Light	4-0-4	4-0-4	....
Electives*			3-0-3	3-0-3	3-0-3
		Total	15-15-20	13-18-19	15-15-20

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Architectural Design, Opt. No. 1 and Structural Design Opt. No. 2

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	401-2-3	Design	1-15-6	1-15-6	1-15-6
Arch.	410-12	Freehand Drawing	0-6-2	0-6-2	....
Arch.	425-26	Construction, Steel	3-0-3	3-0-3	....
Arch.	437-8-9	History	3-0-3	3-0-3	3-0-3
Arch.	441	Office Practice	....	....	2-0-2
M.E.	329-30-31	Mechanical Equipment of Buildings	2-0-2	2-0-2	1-3-2
Arch.	537	(Opt. 1.) City Planning	....	....	3-0-3
C.E.	305	(Opt. 2) Structural Analysis I	....	....	3-0-3
Electives*			3-0-3	3-0-3	3-0-3
		Total	12-21-19	12-22-19	11-18-19

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

FIFTH YEAR

Architectural Design, Option No. 1

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	442	Office Practice, Specs	3-0-3	....	....
Arch.	501-2-3	Architectural Design and Thesis	1-21-8	1-21-8	2-33-13
Arch.	510	Freehand Drawing	0-3-1	....	....
Arch.	513-14	Freehand Life Drawing	....	0-3-1	0-6-2
Arch.	533	History	....	2-0-2	....
Arch.	542	Office Practice: Supervision	....	2-0-2	....
Arch.	545	Thesis Research	....	2-0-2	....
C.E.	406-400	Reinforced Concrete	2-3-3	3-0-3	....
E.E.	315	Mechanical Plant of Buildings	....	....	3-0-3
Electives			3-0-3	....	....
		Totals	9-27-18	10-24-18	5-39-18

FIFTH YEAR

Structural Design, Option No. 2

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	442	Office Practice, Specs.	3-0-3	....	....
Arch.	520-21	Structural Design and Thesis	....	1-21-8	2-15-7
Arch	522	Structural Des. Integr.	....	3-3-4	....
Arch.	533	History	....	2-0-2	....
Arch.	542	Office Practice: Supervision	....	2-0-2	....
Arch.	546	Thesis Research	2-6-4	....	....
C.E.	406-400	Reinforced Concrete	2-3-3	3-0-3	....
C.E.	409	Soil Mechanics & Foundations	....	....	4-3-5
C.E.	204	Elementary Surveying	1-3-2	....	....
C.E.	306	Structural Analysis	3-3-4	....	....
E.E.	315	Mechanical Plant of Buildings	....	....	3-0-3
M.E.	353	Materials Laboratory	0-3-1	....	....
Electives			....	....	3-0-3
		Totals	11-18-17	11-24-19	12-18-18

JUNIOR YEAR

Light Construction Industry, Option No. 4

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	322, 23, 24	Building Materials	2-0-2	2-0-2	2-0-2
Arch.	326, 27	Construction: Design	....	....	....
		Selection and Timber	3-0-3	....	3-0-3
Arch.	337, 38, 39	History	2-0-2	2-0-2	2-0-2
C.E.	204	Elementary Surveying	1-3-2	....	....
S.S.	204	Economics	....	3-0-3	....
I.M.	336	Accounting Survey	....	....	3-0-3
Eng.	315	Public Speaking	....	....	3-0-3
Mech.	301, 04	Applied Mechanics	2-0-2	0-3-1	....
Mech.	331, 336	Strength of Materials	....	3-0-3	3-0-3
M.E.	353	Materials Laboratory	....	0-3-1	....
Phys.	212, 13	Elementary Electricity: Heat, Light, Sound	4-0-4	4-0-4	....
Elective*			3-0-3	3-0-3	3-0-3
		Totals	17-3-18	17-6-19	19-0-19

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Light Construction Industry, Option No. 4

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	422	Costs and Estimates	2-3-3	....	....
Arch.	425, 6	Steel Construction	3-0-3	3-0-3	....
Arch.	441, 2	Prof. Practice and Specs.	....	2-0-2	3-0-3
Arch.	542	Office Practice, Supervision	....	....	2-0-2
M.E.	329, 30, 1	Mech. Equip. of Bldgs.	2-0-2	2-0-2	1-3-2
E.E.	315	Mech. Plant of Bldgs.	....	3-0-3	....
Eng.	321/5	Tech. or Business Eng.	3-0-3	....	....
C.E.	406	Reinf. Concrete Des.	....	2-3-3	....
C.E.	400	Reinf. Concrete Des. or	....	....	3-0-3
I.M.	411	I.M. Principles/Probs.			
I.M.	316	Finance Survey	3-0-3	....	....
I.M.	317	Industrial Marketing	....	....	3-0-3
I.M.	329	Survey in Bus. Law	....	....	3-0-3
Psy.	302	Applied Psychology	....	3-0-3	....
Elective			5-0-5	3-0-3	4-0-4
		Totals	18-3-19	18-3-19	19-3-20

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Arch. 102. Architectural Drawing (Preliminary to Design) 0-6-2.
Prerequisite: Drawing 101, or concurrently. Mr. Ramey and Assistants.
An introductory study in drawing and in the principles of visual design.
Text: *None.*

Arch. 103. Architectural Drawing (Preliminary to Design) 0-6-2.
Prerequisite: Arch. 102 or Drawing 103. Mr. Ramey and Assistants.
Continuation of Arch. 102.
Text: Ramsey and Sleeper, *Architectural Graphic Standards.*

Arch. 201. Introduction to Design 1-0-1.
Prerequisite: None. Mr. Bush-Brown.
An introduction to design. Lecture and assigned reading.
This course is a requirement for all students in the School of Architecture and is open to all engineering students.
Text: Faulkner, Ziegfeld & Hill, *Art Today.*

Arch. 204. Graphics: Descriptive Geometry 1-4-2.
Prerequisite: Arch. 102. Mr. Gailey and Mr. Greene.
The study of lines, planes and solids and the intersection of planes and solids, represented in two dimensional drawings.
Text: Kenison and Bradley, *Descriptive Geometry.*

Arch. 205. Graphics: Shades and Shadows 1-4-2.
Prerequisite: Arch. 204. Mr. Gailey and Mr. Greene.
Study of light, shades and shadows produced by light rays.
Text: *None.*

Arch. 206. Graphics: Perspective 1-4-2.

Prerequisite: Arch. 204. Mr. Gailey and Mr. Greene.

Representation of three dimensional forms in what is the architect's principal medium of expression, two dimensional drawings.

Text: Morgan, *Architectural Drawing.*

Arch. 207. Design 1-12-5.

Prerequisites: Arch. 103, Math. 103, and Soph. standing.

Mr. Grady assisted by Mr. Greene.

This is a course in basic design in which the student, by the creative process, begins his study of the principles of aesthetics; the theory and practice of pure design.

Text: *None.*

Arch. 208. Design 1-12-5.

Prerequisite: Arch. 207. Mr. Hurst.

The first course in architectural design in the design sequence includes the working out of a solution of the problem of a small residence.

Text: *None.*

Arch. 209. Design 1-12-5.

Prerequisite: Arch. 208. Mr. Pretz.

This course includes working drawings, construction details and a construction scale model of a small house designed in Arch. 208, several students collaborating, with individual applications for mortgage insurance and description of materials.

Text: Dietz, *Dwelling House Construction.*

Arch. 212. Freehand Drawing 0-3-1.

Prerequisite: Arch. 207. Mr. Rabun or Mr. Harris.

Elementary course in freehand drawing, for non-architects and those who need further preparation for Arch. 310.

Text: *None.*

Arch. 213. Architectural Rendering 0-3-1.

Prerequisite: Arch. 207. Mr. Rabun.

An elementary course in rendering Architectural subjects in various media. Concentration on study and presentation techniques.

Text: *None.*

Arch. 301-2-3. Design 1-12-5.

Prerequisites: Arch. 209, Phys. 207—Restricted.

Mr. Godfrey, Mr. Rabun, and Mr. Shipley.

Programs in design representing comparatively simple programs, calling for individual study and solution on the part of each student.

Text: *None.*

Arch. 310-11-12. Freehand Drawing 0-3-1.

Prerequisite: Arch. 207. Mr. Harris and Mr. Rabun.

Freehand drawing from compositions by the students.

Text: *None.*

Arch. 313. Color Theory 1-3-2.

Prerequisite: Arch. 207 or Junior standing. Mr. Greene.

Lecture, laboratory experiment and group discussion on the properties of color and its possibilities in design.

Text: *None.*

Arch. 322-23-24. Construction: Building Materials 2-0-2.

Prerequisite: Arch. 208, except for transfer students and non-Architecture students. Mr. Gailey and Mr. Hurst.

This course is devoted to the study of the materials of construction, with attention given to the effect which the nature of materials has upon design, and the various ways of using materials in modern construction.

Text: Gay & Parker, *Materials and Methods of Architectural Construction.*

Arch. 326. Architectural Construction 3-0-3.

Prerequisite: Arch. 322. Mr. Godfrey.

An approach to the basic selection of the structural system to aid the designer in choosing the most appropriate structural elements such as building frame, floor, roof and wall construction for any building, as governed by types of occupancy, equipment and architectural design.

Text: Crane, *Architectural Construction; National Building Code.*

Arch. 327. Construction: Wood 3-0-3.

Prerequisites: Arch. 326, Mech. 331. Mr. Tindel.

Study in theory of timber structures with practical application of theory carried out in design of beams, columns and trusses.

Text: Scofield and O'Brien, *Modern Timber Engineering; National Building Code; NLMA Wood Structural Design Data.*

Arch. 334. History of Architecture 3-0-3.

Prerequisite: Junior standing. Mr. Shipley.

Three lectures a week are given with the aid of lantern slides; subject—the history of architecture from its origin in Egypt and Mesopotamia, through Ancient Greece and Rome. Research on the part of students supplements classroom lectures and illustrated reports and notes are called for from time to time.

Text: Banister Fletcher, *A History of Architecture.*

Arch. 337-38-39. History of Architecture 2-0-2.

Prerequisite: Arch. 201. Mr. Pretz or Mr. Shipley.

This course of history is for those in the School of Arch. or from other schools who are not candidates for an architectural degree. In non-technical language, it covers history from ancient up to the contemporary movement with lectures and lantern slides.

Text: Waterhouse, *The Story of Architecture.*

Arch. 381-2. Design and Graphic Presentation 1-12-4.

Prerequisite: Junior or senior standing and consent of instructor. Not open to architecture students except by consent of instructor.

Mr. Rabun, Mr. Saporta, or Mr. Wilson.

Primarily for non-architecture students preparing to study City Planning. Basic elements of design, as well as drafting, lettering, perspective, rendering, freehand drawing, and model making, taught through the medium of simple design problems and numerous short sketch problems.

Arch. 401-02-03. Design 1-15-6.

Prerequisites: Arch. 303 and Senior Standing.

Mr. D. J. Edwards, Mr. Saporta and Mr. Wilson.

A continuation of Arch. 303. Architectural design problems of increasing extent and complexity which may include site planning of building groups. In 403 the student is tested for his fitness to go on to fifth year.

Text: *None.*

Arch. 404. Architectural Design 1-15-6.

Prerequisite: Arch. 403 Mr. D. J. Edwards or Mr. Wilson.

A continuation of Arch. 403 for those men who are considered insufficiently prepared to qualify for Fifth Year Design.

Text: *None.*

Arch. 410. Freehand Drawing 0-6-2.

Prerequisite: Arch. 312. Mr. Wilson or Mr. Rabun

Outdoor Sketching in various media.

Text: *None.*

Arch. 411. Freehand Drawing 0-3-1.

Prerequisite: Arch. 410. Mr. Gailey

Outdoor subjects and still life.

Text: *None.*

Arch. 412. Freehand Drawing 0-6-2.

Prerequisite: Arch. 312. Mr. Gailey or Mr. Rabun

Outdoor subjects and still life.

Text: *None.*

Arch. 416. Introduction to Landscape Architecture 2-0-2.

Prerequisites: Arch. 438, Arch. 401. Mr. Wigginton

A brief history of landscape architecture is followed by a study of principles of landscape design as applied to contemporary problems.

Text: *None.*

Arch. 422. Construction: Costs and Estimates 2-3-3.

Prerequisites: Arch. 324 or equivalent. Elective for other Juniors and Seniors. Mr. Moran

Preparation of material and labor quantity surveys from actual working drawings and specifications. Computing of bids and collection of cost data.

Text: Pulver, *Construction Estimates and Costs.*

Arch. 425. Construction: Steel 3-0-3.

Prerequisites: Arch. 327, Mech. 336. Mr. Polychrone or Mr. Tindel

Theory and design of steel beams, plate girders, and columns; riveted connections.

Text: Hauf and Pfisterer, *Design of Steel Buildings; AISC, Steel Construction.*

Arch. 426. Construction: Steel 3-0-3.

Prerequisite: Arch. 425. Mr. Boguslavsky or Mr. Polychrone

A continuation of Arch. 425; roof trusses, building design; welded connections; wind stresses.

Text: Hauf and Pfisterer, *Design of Steel Buildings; AISC, Steel Construction.*

Arch. 435. History of Art. 2-0-2.

Prerequisite: Jr. or Sr. Standing. Mr. Harris

This course of lectures, with the aid of lantern slides, consists of a survey of the more important manifestations of artistic expressions from primitive man to our own day.

Text: Upjohn, Wingert and Mahler, *History of Art.*

Arch. 437, 438, 439. History of Architecture 3-0-3.

Prerequisite: Arch. 334. Mr. Bush-Brown, Mr. Pretz, & Mr. Grady

A continuation of Arch. 334 covering the architecture of the Medieval period, the Renaissance and the 19th and 20th centuries up to and including the modern movement.

Text: Banister Fletcher, *A History of Architecture*
Pretz, *Architecture of the Renaissance*
Richards, *Modern Architecture.*

Arch. 441. Professional Practice 2-0-2

Prerequisite: Senior Standing or Consent. Mr. H. G. Edwards

This course deals with professional ethics, office organization, competitions, contracts, and the customary procedure in architectural practice.

Text: A.I.A., *Handbook of Architectural Practice.*

Arch. 442. Office Practice: Specifications 3-0-3.

Prerequisites: Arch. 324 and 441 or equivalent. Mr. H. G. Edwards

Principles and practice of the writing of specifications.

Text: H. G. Edwards, *Specifications.*

Arch. 444. Housing Seminar 2-0-2.

Prerequisite: Junior or Senior Standing. Mr. Saporta

Lecture and discussion broadly covering the housing field, including the home building industry, financing housing, housing needs and markets, standards of design and construction, the Government and housing.

Arch. 501-02. Architectural Design: Advanced 1-21-8.

Prerequisite: Acceptance as a candidate for the B.Arch. degree on approval of the Department Staff.

Mr. Heffernan and Mr. Edwards, Mr. Saporta or Mr. Wilson, assisted by Mr. Polychrone

Advanced design from varied architectural programs with emphasis on site planning and complex circulation problems.

Text: *None.*

Arch. 503. Architectural Design: Thesis 2-33-13.

Prerequisite: Arch. 502 and 545. Mr. Heffernan and Staff

Solution of an advanced architectural program prepared by the student, research, and integration of structural and working drawings, serving as a thesis for men who are candidates for the degree Bachelor of Architecture.

Text: *None.*

Arch. 510. Freehand Drawing: Advanced 0-3-1.

Prerequisite: Arch. 412. Mr. Heffernan or Mr. Rabun

Freehand drawing of varied subjects and in various media.

Text: *None.*

Arch. 511-12. Freehand Drawing: Advanced 0-3-1.

Mr. Heffernan

A continuation of Arch. 510. Studies in three dimensional form.

Text: *None.*

Arch. 513-14. Freehand: Life Drawing 0-3-1, 0-6-2.

Prerequisite: Arch. 412.

Freehand drawing from live models. Given at the Atlanta Art Institute.

Text: *None.*

Arch. 520-21. Structural Design: Thesis 1-21-8, 2-15-7.

Prerequisites: Arch. 403 and 546. Mr. Boguslavsky

Structural design of buildings in wood, steel, and concrete, including analysis, selection, structural computations, and structural drawings.

Text: *A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structure.*

Arch. 522. Construction: Structural Design Integration 3-3-4.

Prerequisites: C.E. 400 and Arch. 425. Mr. Boguslavsky

This course brings together the information obtained in the previous courses in structural design and presents the subject matter as an integrated whole.

Text: CRSI, *Design Handbook. Lecture Notes.*

Arch. 530. History of Art. 2-0-2.

Prerequisites: Arch. 339, 435, or 439. Mr. Grady

A survey of 19th and 20th century art in Europe and the United States.

Text: *None.*

Arch. 533. History of Architecture 2-0-2.

Prerequisite: Arch. 339 or 438 or consent. Mr. Grady

The history of American architecture.

Text: *None.*

Arch. 537. City and Community Planning I 3-0-3.

Prerequisite: Senior standing. Mr. Saporta

This course consists of lectures and discussions dealing with the history of town and city planning in Europe and America, and includes study and reports on present day planning problems.

Text: Gallion, *The Urban Pattern.*

Arch. 539. City and Community Planning II 3-0-3.

Mr. Saporta

A continuation of 537. An elective course for Seniors, Fifth Year and Graduates only. Analysis of contemporary cities with an emphasis on conditions in Atlanta. Visits to various typical sectors and public services. Reading and group discussions on principles of regional planning, accumulation of vital statistics, resources, finances, city government, traffic, sanitation, slum clearance, public housing, recreation, green areas, civic center, public services, education, real estate policy, industrial and commercial development.

Text: ASPO, *Action for Cities.*

Arch. 540-41. Special Research 0-6-2, 0-9-3, 1-9-4.

Mr. Godfrey and Staff

A clearly stated program by the student describing in detail the nature, purpose and extent of the proposed problem must be submitted for approval. If this course is taken for credit, faculty approval must be obtained. The major portion of the work will be conducted in library, drafting room, shop or photo dark room.

Text: *None.*

Arch. 542. Office Practice: Supervision 2-0-2.

Prerequisites: Arch. 441 and Senior Standing. Mr. Pretz

This course includes information and guidance in job management and architectural supervision of construction.

Text: A.I.A., *Handbook of Architectural Practice.*

Arch. 545. Thesis Research—Option 1 2-0-2.

Prerequisite: Arch. 403. Mr. Grady

Compilation of requisite material for architectural design thesis to be executed in Arch. 503. Selection of problem and site, client, conferences, technical research, programming, written reports.

Text: *None.*

Arch. 546. Thesis Research—Option 2 2-6-4.

Prerequisites: Arch. 327, 426, and 403. Mr. Polychrone

An examination of structural systems available to the architect. The study includes Rigid Frames, Vierendeel Trusses, Arches, Plates and Diagrids, Space Frameworks, Shells and Folded Plates.

Text: *None.*

Industrial Design, Option 3

Industrial design deals with the development of those products of industry with which man, in utilizing them, has direct visual and physical relationship, such as utensils, appliances, equipment, and furnishings for the home, industry, commercial and public places. The course deals with the actual designing and execution of test models as well as with the theoretical aspect of designing for mass-production.

The specialized course in industrial design begins at the second term of the sophomore year.

INDUSTRIAL DESIGN

Sophomore Year, Option 3

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Arch.	201	Introduction to Design	1-0-1	....	....
Arch.	204-6	Graphics	1-4-2	1-4-2	....
Arch.	207	Design	1-12-5	....	....
I.D.	202-3	Design	....	1-12-5	1-12-5
I.D.	215-16	Material and Technique	....	1-3-2	1-3-2
Eng.	201-2-3	Survey of Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2	Calculus	5-0-5	5-0-5	....
Phys.	207	Mechanics	....	....	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Total	14-21-19	14-24-20	13-23-19

Junior Year, Option 3

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
I.D.	301-2-3	Design	1-12-5	1-12-5	1-15-6
I.D.	314-15-16	Material and Technique	1-3-2	1-3-2	1-3-2
Arch.	212-13	Free Hand Drawing, Rendering	0-3-1	0-3-1	....
Arch.	313	Color Theory	....	....	1-4-2
Arch.	337-38-39	History of Architecture	2-0-2	2-0-2	2-0-2
Ch.E.	325	General Metallurgy	....	3-0-3	....
Ch.E.	328	Chem. of Engineering Materials	....	....	3-0-3
Phys.	212-13	Elementary Electricity, Heat, Sound, Light	4-0-4	4-0-4	....
Mech.	301-4	Applied Mechanics	2-0-2	....	0-3-1
Elective			3-0-3	3-0-3	3-0-3
		Totals	13-18-19	14-18-20	11-25-19

Senior Year, Option 3

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
I.D.	401-2-3	Design	1-15-6	1-18-7	1-21-8
I.D.	414	Material and Technique	1-3-2	....	....
Arch.	530	History of Art	....	....	2-0-2
Psy.	301-02	Introductory and Applied Psychology	3-0-3	3-0-3	....
S.S.	313	The Problems of Public Opinion	3-0-3	....	....
I.M.	317	Industrial Marketing	....	3-0-3	....
I.E.	490	Legal and Ethical Phases of Engineering	....	....	3-0-3
S.S.	204	Economics	....	3-0-3	....
Eng.	321 or 325	Technical or Business English	3-0-3	....	....
Elective			3-0-3	3-0-3	6-0-6
		Totals	14-18-20	13-18-19	12-21-19

Courses of Instruction

All Courses Conducted by Professor Bredendieck Assisted by Mr. Worrell

Industrial Design Course Series

I.D. 202. Design. 1-12-5.

Prerequisite Arch. 207. Concurrent with I.D. 215.

Introduction to Industrial Design.

A series of abstract problems dealing with the elements of a design-process.

Text: *None.*

I.D. 203. Design. 1-12-5.

Prerequisite I.D. 202. Concurrent with I.D. 216.

Introduction to design analysis. Designing of simple objects.

Text: *None.*

I.D. 215. Material and Technique 1-3-2.

The standard joints and hand operated machines. Exercises, execution and developing of joints.

Text: *None.*

I.D. 216. Material and Technique 1-3-2.

Prerequisite I.D. 215 or consent of instructor.

Continuation of I.D. 215, hand operated machines—wood and metal turning, spinning, bending, laminating, etc. Assembly techniques.

Demonstration, exercises, field trips, and designing of object for each technique.

Text: *References.*

I.D. 301. Design. 1-12-5.

Prerequisite I.D. 203. Concurrent with I.D. 314.

Continuation of the design-analysis of I.D. 203 in regard to the different groups of objects. Designing of object of the different groups.

Text: *None.*

I.D. 302. Design. 1-12-5.

Prerequisite I.D. 301. Concurrent with I.D. 315.

Designing of objects (such as seating, simple storage, etc.) which have no engineered parts, for home, commercial and public places.

Text: *None.*

I.D. 303. Design. 1-12-6.

Prerequisite I.D. 302. Concurrent with I.D. 316.

Designing of equipment and appliances incorporating such engineered units as heating-coils, fans, motors, etc.

Text: *None.*

I.D. 314. Material and Technique 1-3-2.

Prerequisite I.D. 216.

Casting and fabricating techniques—plaster, plastic-casting, blowing, sand casting, ceramics, paper, rubber, etc.

Demonstration, exercises, field trips and designing of objects for each technique.

Text: *References.*

I.D. 315. Material and Technique 1-3-2.

Prerequisite I.D. 314.

The industrial preformed materials—extrusion, rolled and drawn profile, mouldings, etc.

Demonstration, exercises, field trips, and designing of objects for each technique.

Text: *References.*

I.D. 316. Material and Technique 1-3-2.

Prerequisite: I.D. 315.

Semi-automatic and mass-production techniques—forging, stamping, heading, screw machine, wire forming.

Demonstration, field trips, and designing of objects for each technique.

Text: *References.*

I.D. 401. Design. 1-15-6.

Prerequisite I.D. 303. Concurrent with I.D. 414.

Designing of appliances and equipment for the commercial, industrial and public fields (such as machines, store and office appliances). Designing of packaging for industrial products.

Text: *None.*

I.D. 402. Design. 1-18-7.

Prerequisite I.D. 401.

Designing of groups of objects which comprise larger functional units.

Text: *None.*

I.D. 403. Design. 1-21-8.

Prerequisite I.D. 402.

Continuation of I.D. 402 comprising more complex units such as home, public, and commercial interiors, exhibitions and displays.

Text: *None.*

I.D. 414. Material and Technique 1-3-2.

Prerequisite I.D. 316.

The mass-production techniques—die casting, impact extrusion, compression—transfer—injection—moulding, etc.

Demonstration, field trips, and designing of objects for each technique.

Text: *References.*

* * *

GRADUATE COURSES

(Complete details about graduate courses in Architecture and City Planning are contained in the Graduate Bulletin, a copy of which is available upon request.)

SCHOOL OF CERAMIC ENGINEERING

(Established in 1924)

Director—Lane Mitchell; *Professor*—Harrison W. Straley, III; *Associate Professor*—Alfred T. Navarre; *Assistant Professors*—William C. Hansard, Charles F. Wysong; *Secretary*—Mrs. Gene T. Brooks; and *Technician*—Thomas Mackrovitch.

General Information

A four-year curriculum leads to the degree of Bachelor of Ceramic Engineering. Graduate work leading to the Master of Science in Ceramic Engineering is also offered. A broad basic training is given in the fundamental and engineering courses, thus preparing the student to enter successfully any division of ceramic engineering. However, the necessary cultural courses are included. The classroom, laboratory and library work are coordinated to combine theoretical and practical knowledge. Periodic contacts with the non-metallic mineral and clay-working industries of the State enlarge the practical viewpoint of the student.

The school is vitally concerned with future development of the ceramic and mineral industries in the South. Through research, the use of Georgia minerals has been extended so that almost every ceramic industry may find the greater proportion of its raw materials within the state boundaries. Demonstration of a stable market and the many industrial advantages of Georgia are encouraging the establishment of new industries. In this program the School is using its facilities to aid proper development.

The School also offers to non-ceramic majors a survey course in Ceramics and service courses in Geology and Geography. The courses in Geology are designed to give the student a thorough grounding in the basic principles of Geology and Mineralogy and their application to the particular field of engineering the student is preparing to enter. The school has type collections for Mineralogy and Geology; a collection of building stones, ceramic clays and fossils; maps and folios; and the usual Mineralogy laboratory equipment. Those students majoring in Ceramic Engineering and Civil Engineering and the Geophysical option in Physics are required to take Geology subjects. Students in other major curricula may elect Geology courses.

Students wishing to emphasize geology and geological processes in their ceramic training or in their training in other branches of engineering might arrange for certain substitutions of courses in the program, after conference with the Director.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 mean 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Cer.E.	201	Introduction to Ceramics	2-3-3	....	....
Cer.E.	202	Products and Materials	....	2-3-3	....
Cer.E.	203	Equipment and Tests	....	....	2-3-3
Chem.	211-14-15	Analytical Chemistry	4-0-4	2-6-4	2-6-4
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC		ROTC	3-1-2	3-1-2	3-1-2
		Totals	19-11-21	17-17-21	17-17-21

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Cer.E.	303	Calculations	....	....	3-0-3
Cer.E.	311	Processing and Forming	3-3-4	....	....
Cer.E.	312	Bodies	....	3-0-3	....
Cer.E.	314	Vitreous Ceramic Coatings	....	....	3-3-4
Cer.E.	318	Pyrometry and Instruments	....	1-3-2	....
Chem.	331-32-33	Physical Chemistry	3-0-3	3-0-3	3-0-3
Chem.	334-35-36	Physical Chemistry Laboratory	0-3-1	0-3-1	0-3-1
Eng.	201-02-03	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Geol.	201	General Geology	....	3-0-3	....
Geol.	202	General Geology Laboratory	....	0-3-1	....
Geol.	414	Mineralogy	....	....	2-3-3
Mech.	301	Applied Mechanics	2-0-2	....	....
Mech.	331-32	Mechanics of Materials	3-0-3	2-0-2	....
Elective*			3-0-3	3-0-3	3-0-3
		Totals	17-6-19	18-9-21	17-9-20

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Cer.E.	406	Seminar	....	....	2-0-2
Cer.E.	409	Microscopy	3-6-5	....	....
Cer.E.	411-12	Thesis	....	1-6-3	0-6-2
Cer.E.	413	Enamels	2-3-3	....	....
Cer.E.	418	Drying and Psychrometry	2-0-2	....	....
Cer.E.	419	Firing and Combustion	....	2-3-3	....
Cer.E.	425	Physical Ceramics	....	3-3-4	....
Cer.E.	431-32-33	Design and Construction	1-3-2	0-6-2	1-6-3
Ch.E.	325	General Metallurgy	....	....	3-0-3
C.E.	204	Elementary Surveying	....	....	1-3-2
I.E.	416	Motion and Time Study	3-0-3	....	....
M.E.	320	Thermodynamics	....	4-0-4	....
M.E.	332	Elementary Heat Power Engrng.	....	....	3-0-3
Elective*			3-0-3	3-0-3	3-0-3
		Totals	14-12-18	13-18-19	13-15-18

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

RECOMMENDED ELECTIVES*

Course	*No.*	*Subject*	*Hours*
Cer.E.	421	Cements	2-3-3
Geol.	305	Historical Geology	3-0-3
Geol.	307	Historical Geology Laboratory	0-3-1
Geol.	310	Crystallography and Tests	1-3-2
Geol.	311	Economic Geography	3-0-3
Geol.	312	Economic Geology	3-0-3
Geol.	313	Economic Geology Laboratory	0-3-1
Geol.	418	Petrography	2-6-4
Geol.	421	Geological Processes	2-6-4
Geol.	422	Structural Geology	2-6-4
Geol.	423	Introduction to Geophysics	3-3-4
Geol.	424	Field Methods in Geology	0-6-2
Geol.	425	Field Methods in Geology	0-6-2
Geol.	426	Field Methods in Geology	0-6-2
Geol.	443	Advanced Engineering Geology	2-6-4
Geol.	445	Mining of Ceramic Materials	2-0-2

*Check quarterly schedule of course offerings to determine if offered. Ordinarily a request for a course by eight or more students will be honored. Also, check prerequisites required. To take many Geology electives, it is necessary to schedule Geology 201 earlier than is required.

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Cer.E. 201. Introduction to Ceramics 2-3-3.

Prerequisite: *None.* Mr. Mitchell

History of ceramics; the place of ceramics in the world, in art, in engineering, in the home, and in all industries. An elementary survey of processes and products. Laboratory same as Cer.E. 209.

Cer.E. 202. Products and Materials 2-3-3.

Prerequisite: Chem. 103, Cer.E. 201. Mr. Mitchell and Mr. Wysong

An engineering survey of ceramics; relationship between industrial service requirements and the properties of ceramic products. The common ceramic materials are classified according to mineralogical character; their influence on each other and the effects of size, physical, and pyro-physical properties of particles are stressed.

Text: McNamara, *Ceramics II and III.*

Cer.E. 203. Equipment and Tests 2-3-3.

Prerequisite: Chem. 103, Cer.E. 201. Mr. Wysong and Mr. Mitchell

Testing of ceramic raw materials and products; requirements of proper test methods and practical applications to industry.

Interpretation of results and writing of formal reports. Uses, operation, and calibration of machinery, apparatus, and equipment for ceramic manufacture or testing. Mathematical analysis of data; inherent errors.

Text: McNamara, *Ceramics II and III.*

Cer.E. 208. Ceramic Survey 2-0-2.

Prerequisite: *None.* General Elective for non-ceramic majors.

Mr. Mitchell or Mr. Hansard

A survey is made of the classification and physical properties of ceramic products. The physical properties of raw materials are studied briefly with emphasis on qualities and limitations which relate to design.

Text: *Course Notes* by Mr. Mitchell.

Cer.E. 209. Ceramic Survey Laboratory 0-3-1.

Prerequisite or Corequisite: Cer.E. 208. Mr. Hansard

Plant trips to local ceramic plants. Production of molds and pottery.

Text: *None.*

Cer.E. 303. Calculations 3-0-3.

Prerequisites: Cer.E. 312; Chem. 332. Mr. Wysong

Solutions of engineering and practical mathematical problems involved in the manufacture of ceramic wares. Statistical methods. Phase equilibria calculations.

Text: Andrews, *Ceramic Calculations; A.Cer.S. Phase Rule Compilations.*

Cer.E. 311. Processing and Forming 3-3-4.

Prerequisite: Cer.E. 203. Mr. Wysong

Winning, refining and preparation of ceramic raw materials, methods and mechanism of processing and forming ceramic products; their effect on the control of the properties of the products and adaptation to service requirements.

The relation of laboratory technique to plant practice including properties of materials, machines, processing and products. Commercial raw materials and products are provided and analyzed and, where practical, the corresponding plants are visited.

Text: McNamara, *Ceramics II and III.*

Cer.E. 312. Bodies 3-0-3.

Prerequisite: Cer.E. 311. Mr. Hansard or Mr. Mitchell

The physical and chemical properties of earthy materials throughout common processes used in the production of ceramic wares. Control of phases of manufacture to introduce in the product those properties service conditions require. Principally concerned with whitewares, but terra cotta, heavy clay products and glass are included. Body, mold, and sagger composition and processing are studied.

Text: Courses Notes; Newcomb, *Ceramic Whitewares.*

Cer.E. 314. Vitreous Ceramic Coatings 3-3-4.

Corequisite: Cer.E. 303. Mr. Hansard

Phase relations of the important oxides and the properties of these oxides in siliceous melts are studied. The fundamental underlying methods of calculating, compounding, manufacturing and using silicate coatings on ceramic bodies are covered as well as the methods commonly employed to correct faults.

Text: Parmelee, *Ceramic Glazes.*

Cer.E. 318. Pyrometry and Instruments 1-3-2.

Prerequisite: Physics 209. Mr. Wysong

The principles of heat measurement by shrinkage rings, melting points, color, pyrometric cones, expanding metals, thermocouples and resistance bridges. The factors governing choice of thermocouples. The principles behind construction of couples, pyrometers, differential couples, CO_2 meters, temperature controls, and other control instruments.

Text: Foote, Fairchild and Harrison, *Pyrometric Practice*; Dike, *Thermoelectric Thermonetry.*

Cer.E. 406-7-8. Seminar 2-0-2.

Prerequisite: Senior standing in Cer.E. Mr. Wysong, Mr. Mitchell

Discussion of current ceramic and scientific literature and reports of investigation. Additional seminar work may be elected as Cer.E. 407, or Cer.E. 408.

Text: *Journal of American Ceramic Society.*

Cer.E. 409. Microscopy 3-6-5.

Prerequisites: Physics 209, Geology 414. Mr. Wysong

Involves the use of the microscope in the study and control of composition and structure of ceramic bodies and raw materials. Nature of light and crystallography are briefly studied.

Text: Rogers and Kerr, *Optical Mineralogy.*

Cer.E. 411. Thesis 1-6-3.

Prerequisite: Senior Standing in Ceramic Engineering.

Each senior conducts an original investigation on an approved ceramic subject under the supervision of the instructor in charge. The object of this course is to place the student upon his own initiative and to coordinate the knowledge that he has previously received.

Text: *None.*

Cer.E. 412. Thesis 0-6-2.
Prerequisites: Senior Standing in Cer.E.; Cer.E. 411.
Extension of Cer.E. 411.
Text: *None.*

Cer.E. 413. Enamels 2-3-3.
Prerequisite: Cer.E. 312. Mr. Hansard
Covers enamel compositions and foundation materials and the processing of the metal and enamels for sheet iron and cast iron enamel ware. Past and current theory and practice are included.
Text: Andrews, *Enamels.*

Cer.E. 418. Drying and Psychrometry 2-0-2.
Prerequisites: Cer.E. 312; Physics 209. Mr. Mitchell
Fundamental consideration of water removal from unfired ceramic products by heat and air. Control of humidity, temperatures, air velocity and volume; economy and efficiency of drying and driers; problems to be met in safe drying.
Text: Madison, *Fan Engineering.*

Cer.E. 419. Firing and Combustion 2-3-3.
Prerequisites: Physics 209, M.E. 320 or equivalent. Mr. Wysong
Objectives of firing; combustion behavior of gaseous, liquid and solid fuels; the mechanics of heat transfer, physical and chemical properties of clay and other raw materials under heat treatment; design, operation and heat accounts of periodic and continuous kilns. The utilization of refractories in industry; the control of properties of refractories through raw materials and all phases of manufacture to best meet industrial requirements; fundamentals of aggregate packing and photo-elastic study of expansion and contraction.
Text: Haslam and Russell, *Fuels and Their Combustion; ASTM Refractories Specifications;* Norton, *Refractories.*

Cer.E. 421. Cements 2-3-3.
Prerequisites: Chem. 332; Cer.E. 303. Mr. Mitchell
Includes the required properties of raw materials, processing and the hydraulic properties of cements. Portland, magnesia, high alumnia, dental, and gypsiferous cements are included. This is an elective course for seniors and graduates. This course is offered periodically upon demand of six or more students.

Cer.E. 425. Physical Ceramics 3-0-3.
Prerequisites: Cer.E. 312, Chem. 331, and Phys. 209. Mr. Mitchell
Application of Physical Chemistry, Crystal Chemistry, Colloid Chemistry, and Solid States Physics to Ceramics. Dispersion, viscosity, plasticity grain size, crystal structure as related to properties, densification with additives to fill holes in structure, and theory of clay as a colloidal electrolyte are studied. Differential thermal analysis, thermal shock, thermal expansion, electrodrolysis, viscosity measurement, x-ray analysis, and other techniques of analysis are studied in the laboratory.
Text: *Course notes.*

Cer.E. 431-32-33. Design and Construction 1-3-2, 0-6-2, 1-6-3.
Corequisite: Cer.E. 416.
Prerequisite: Drawing 103. Mr. Hansard, Mr. Wysong
Design and working drawings of ceramic manufacturing equipment and plant layouts for specified products. The student makes his own selection under the supervision and with the approval of the instructor.
Text: Marks, *Mechanical Engineers' Handbook.*

Geol. 101. Introduction to Earth Science 3-0-3.
Prerequisite: *None.* Mr. Navarre or Mr. Straley
A survey of both celestial and earthly environment surrounding humanity; utilizing nature's storehouse of raw materials.
Text: Navarre and Straley, *Earth and Men.*

Geol. 201. General Geology 3-0-3.
Prerequisite: *None.* Mr. Navarre or Mr. Straley
An introduction to geological processes, including lectures on historical and economic geology, with special emphasis upon the needs of the engineer.
Text: Landes and Hussey, *Geology and Man.*

Geol. 202. General Geology Laboratory 0-3-1.
Prerequisite or Corequisite: Geol. 201. Mr. Navarre or Mr. Straley
An introduction to the study of minerals, rocks, topographic and geological maps, with special emphasis upon the needs of the engineer.
Text: Navarre and Straley, *Laboratory Outline for Elementary Geology.*

Geol. 305. Historical Geology 3-0-3.
Prerequisites: Chem. 103; Phys. 207, Geol. 201, 202. Mr. Navarre
A course of recitations and lectures in Historical Geology.
Text: Moore, *Introduction to Historical Geology.*

Geol. 307. Historical Geology Laboratory 0-3-1.
Prerequisite or Corequisite: Geol. 305. Mr. Navarre
Recognition and classification of fossils.
Text: *Laboratory Notes.*

Geol. 310. Crystallography and Tests 1-3-2.
Prerequisites: Math. 103; Geol. 201-2. Mr. Navarre or Mr. Wysong
A study of crystal systems, Miller indices and other systems of notation; blowpipe analysis procedures; other tests for classifying crystals.
Text: Phillips, *An Introduction to Crystallography.*

Geol. 311. Economic Geography 3-0-3.
Prerequisite: *None.* Mr. Navarre
The effects of climate, location, power, soil types, mineral deposits, agriculture and manufacture upon nations, peoples, civilization, and trade routes.
Text: Bengtson and Van Royen, *The Fundamentals of Economic Geography.*

Geol. 312. Economic Geology 3-0-3.
Prerequisites: Geol. 201-2. Mr. Navarre
A geographical and economic study of all commercially valuable minerals and rocks.
Text: Emmons, *Economic Geology*.

Geol. 313. Economic Geology Laboratory 0-3-1.
Corequisite or Prerequisite: Geol. 312. Mr. Navarre
The laboratory study of metallic and non-metallic minerals useful to man; it is intended to supplement and accompany Geology 312. Special emphasis is placed upon minerals with important engineering uses. The course will cover the most important ore and non-metallic minerals, especially those used by and for engineers with particular emphasis upon ceramic raw materials, as well as other industrial raw materials.
Text: Dana, *Manual of Mineralogy;* Laboratory notes.

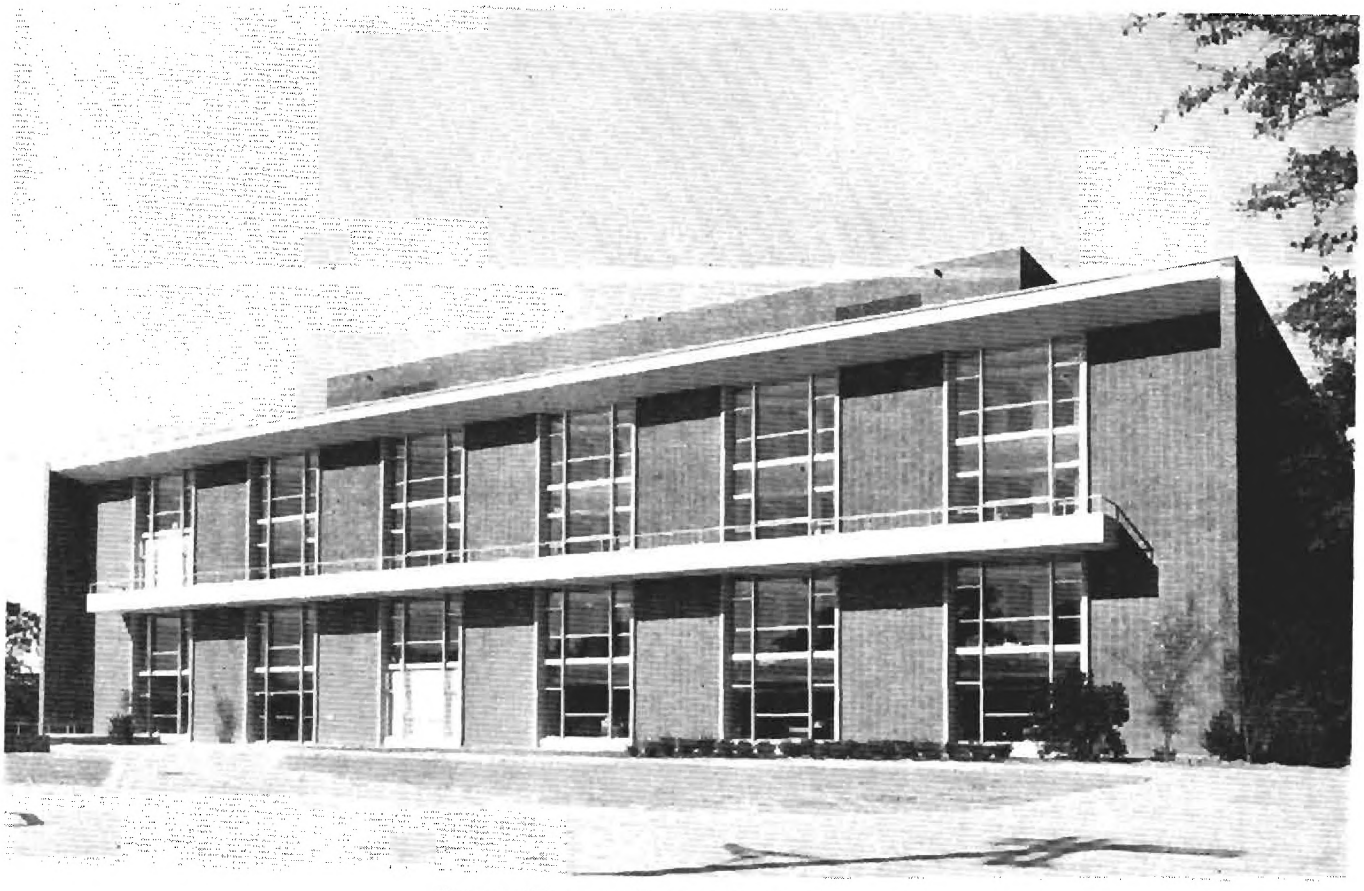
Geol. 414. Mineralogy 2-3-3.
Prerequisites: Geol. 201, 202. Mr. Navarre
A course in descriptive and determinative mineralogy which includes the determination of important minerals and rocks by their chemical and physical properties.
Text: Dana and Ford, *Textbook of Mineralogy*.

Geol. 418. Petrography 2-6-4.
Prerequisite: Geol. 414, Senior Standing. Mr. Navarre
A general survey of the origin, descent, and recognition of rocks, with special emphasis upon engineering considerations and applications. This course will cover the composition, texture, origin, and relationships of rocks. Stress will be laid upon utility in engineering structures and as a raw material for engineering products.
Text: Grout, *Kemp's Handbook of Rocks.*

Geol. 421. Geological Processes 2-6-4.
Prerequisites: Geol. 201-2, Senior Standing. Mr. Straley
An advanced treatment of geological processes, with emphasis upon applications to engineering. The course will cover the more detailed phases of geological processes, gradation, volcanism, and diastrophism, with special emphasis upon those phases which have the greatest bearing in the various fields of engineering.

Geol. 422. Structural Geology 2-6-4.
Prerequisites: Geol. 201-2, Senior Standing. Mr. Straley
A general survey of diastrophism and tectonic phases of volcanism and metamorphism, with emphasis upon application to engineering.
Text: Lahee, *Field Geology;* Lecture and Laboratory Notes.

Geol. 423. Introduction to Geophysics 3-3-4.
Prerequisites: Physics 207-8-9, Geology 201, 202, Senior Standing.
Mr. Straley
A general survey of terrestrial physics, with emphasis upon applications to engineering.



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Geol. 424-25-26. Field Methods in Geology 0-6-2, 0-6-2, 0-6-2.

Prerequisites: Geol. 201-2, Senior Standing. Mr. Navarre

Methods and procedures of areal and subsurface geological mapping, with special emphasis upon structures and problems that arise in connection with engineering work. The development of the techniques of geological surveying as applied to field study and map work in which various aspects of processes are interpreted and mapped in terms of engineering utility. Lithological unity and petrographic types are likewise studied, calculated, and mapped.

Text: Lahee, *Field Geology;* Laboratory and Lecture Notes.

Geol. 443. Advanced Engineering Geology 2-6-4.

Prerequisites: Geol. 201-202. Mr. Straley

Applications of geological science to problems of civil and other engineering. The course will cover mechanical properties of rocks their failure under stress, their behavior under the action of fluids, and suitability for foundations. Bending, breaking and abrasion of rock plates, the movement of igneous bodies and fluids, and applications to problems in Civil, Ceramic, and other engineering will form an integral part of the course.

Geol. 445. Mining of Ceramic Materials 2-0-2.

Prerequisites: Geol. 312, Senior Standing. Mr. Straley

Methods of developing and producing fuel and mineral deposits, with emphasis upon applications to Ceramic engineering and tunneling. Development and production of mineral properties together with the methods used to extract the minerals and transport them to the surface. Some attention will be devoted to safety. Stress will be laid upon the extraction of those materials used in the ceramic industries and to methods of tunneling as used by the civil engineer.

* * *

GRADUATE COURSES

(Complete details about graduate courses in Ceramic Engineering and Geology are contained in the **Graduate Bulletin,** a copy of which is available upon request.)

SCHOOL OF CHEMICAL ENGINEERING

(Established in 1901)

Director—Paul Weber; *Professors*—J. M. DallaValle, H. C. Lewis, Wm. N. Newton, Nathan Sugarman, Waldemar T. Ziegler; *Associate Professors*—Homer V. Grubb, Robert N. Miller, Henderson C. Ward; *Graduate Assistants*—John L. Ergle, Duane L. Franklet, Herschel Godbee, Robert G. Wooten; *Secretary*—Eva K. Browning; *Machinist*—Clarence A. Mayes.

General Information

The degree, Bachelor of Chemical Engineering, may be obtained upon the completion of the following curriculum. The number of students who will be permitted to register for the Junior and Senior work in Chemical Engineering will be strictly limited. The selection will be made on the basis of the student's ability as demonstrated in two years of previous work.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	107-8-9*	General Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-3	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	101-2-3	German	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	**	ROTC	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	214-5	Analytical Chemistry	2-6-4	2-6-4	....
Ch.E.	201	Chem. Engineering Calculations	....	....	3-0-3
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	**	ROTC	3-1-2	3-1-2	3-1-2
		Totals	18-14-21	18-14-21	19-8-20

*Chem. 101, 102, 103 may be scheduled. A minimum grade of C is required for Chem. 101 and 102. The prerequisite for Chem. 214 is Chem. 109 or Chem. 103 with a grade of B or better.

**For course numbers, see the course descriptions under the ROTC sections of this Bulletin.

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Ch.E.	301	Fuels	3-3-4	....	....
Ch.E.	314-5	Unit Operations	....	3-3-4	3-3-4
Ch.E.	339	Chemical Eng. Literature	....	....	1-0-1
Chem.	310-1-2	Organic Chemistry	3-6-5	3-6-5	3-6-5
Chem.	331-2-3	Physical Chemistry	3-0-3	3-0-3	3-0-3
Chem.	334-5-6	Physical Chemistry Laboratory	0-3-1	0-3-1	0-3-1
Mech.	301	Applied Mechanics	2-0-2	....	....
Mech.	331-2	Mechanics of Materials	....	3-0-3	2-0-2
Electives*			3-0-3	3-0-3	3-0-3
		Totals	14-12-18	15-12-19	15-12-19

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Ch.E.	419-20-1	Chem. Engineering Calculations	3-0-3	3-0-3	3-0-3
Ch.E.	425-6	Materials	3-0-3	3-3-4	....
Ch.E.	407-8-9	Chemical Technology	3-0-3	3-0-3	3-0-3
Ch.E.	413	Unit Operations	3-3-4	....	....
Ch.E.	431	Chemical Engineering Economics	....	3-0-3	....
Ch.E.	434	Chemical Engineering Design	....	....	1-6-3
Ch.E.	443-4	Special Problems	0-3-1	0-3-1	....
E.E.	316-7	Applied Electricity	3-0-3	2-3-3	....
M.E.	332	Heat Power Engineering	....	....	3-0-3
Phys.	318	Introduction to Modern Physics	....	....	4-3-5
Electives*			3-0-3	3-0-3	3-0-3
		Totals	18-6-20	17-9-20	17-9-20

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Ch.E. 201. Chemical Engineering Calculations 3-0-3.

Prerequisite: Chem. 215. Staff

Elementary industrial stoichiometry.

Text: Hougen and Watson, *Chemical Process Principles Part I.*

Ch.E. 301. Gas and Fuels, Industrial Stoichiometry 3-3-4.

Prerequisite: Ch.E. 201. Mr. Grubb and Mr. DallaValle

Energy balances are applied to the combustion of fuels and to other processes with emphasis on fluid flow in the latter part of the course.

Text: Brown, *Unit Operations;* Perry, *Chemical Engineer's Handbook;* Staff, *Laboratory Notes.*

Ch.E. 314. Unit Operations 3-3-4.

Prerequisites: Mech. 301, Ch.E. 301. Mr. DallaValle and Mr. Grubb

Flow through porous media, elementary heat transfer, and evaporation.

Text: Brown, *Unit Operations;* Perry, *Chemical Engineer's Handbook;* Staff, *Laboratory Notes.*

Ch.E. 315. Unit Operations 3-3-4.

Prerequisite: Ch.E. 314. Mr. DallaValle and Mr. Lewis

Continuation of Ch.E. 314. Stagewise operations.

Text: Brown, *Unit Operations;* Perry, *Chemical Engineer's Handbook;* Robinson and Gilliland, *Elements of Fractional Distillation;* Staff, *Laboratory Notes.*

***Ch.E. 325. General Metallurgy** 3-0-3.

Prerequisites: Chem. 103 and Physics 207. Mr. Miller

An introductory survey of basic physical metallurgical concepts followed by a study of the characteristics and engineering applications of carbon steels, gray and malleable cast irons. Consideration is given to the engineering significance of static and dynamic properties of metals and alloys.

Text: Keyser, *Basic Engineering Metallurgy.*

Ch.E. 327. General Metallurgy 3-0-3.

Prerequisite: Ch.E. 325. Staff

A study of the characteristics and engineering applications of the more widely used nonferrous alloys. Consideration is given to powder metallurgy as a tool in the fabrication of metallic materials and also to some of the new alloys for ultra high temperature service.

Text: Raudebaugh, *Nonferrous Physical Metallurgy.*

Ch.E. 328. Chemistry of Engineering Materials 3-0-3.

Prerequisite: Chem. 103. Mr. Miller

A survey of materials of construction with emphasis on nonmetallics. The fundamental properties of plastics, and all types of surface coatings are studied.

Text: Schmidt & Marlies, *Principles of High Polymer Theory and Practice.*

Ch.E. 339. Chemical Engineering Literature 1-0-1.

Prerequisites: Ch.E. 301, Chem. 310, 331. Mr. Weber

This course has as its objective the training of students in the use of the sources of information and an introduction to the finding of information in the library.

Text: Mellon, *Chemical Publications.*

Ch.E. 341. Process Instrumentation 2-3-3.

Prerequisite: Ch.E. 314. Mr. DallaValle

Principles of industrial instrumentation and the operation of instruments used for the measurement and control of industrial operations. Includes methods for measuring and controlling temperature, humidity, pressure, flow of fluids, gas and liquid concentrations, suspended materials and servo mechanisms. The laboratory work follows the class work in actual performance of measurements and controls experiments.

Text: Eckman, *Industrial Instrumentation.*

*This course is not to be scheduled by chemical engineering students, since they are required to schedule Ch.E. 425.

Ch.E. 407-8-9. Chemical Technology 3-0-3.

Prerequisites: Ch.E. 315 and Chem. 312.

Mr. Weber and Mr. Sugarman

The chemical and chemical engineering principles which underlie the process industries are studied. Economic factors which have a bearing are included.

Text: Kobe, *Inorganic Process Industries;* Groggins, *Unit Processes in Organic Synthesis.*

Ch.E. 413. Unit Operations 3-3-4.

Prerequisite: Ch.E. 315. Mr. Grubb and Mr. Newton

Continuation of Ch.E. 314-315. Diffusional processes: combined mass and heat transfer.

Text: Brown, *Unit Operations;* Perry, *Chemical Engineer's Handbook.*

Ch.E. 419-20-21. Chemical Engineering Calculations 3-0-3.

Prerequisites: Chem. 333, Ch.E. 315. Mr. Lewis and Mr. Newton

The application of chemical principles and thermodynamic methods to the problems of industry.

Text: Hougen and Watson, *Chemical Process Principles, Part II;* Weber, *Thermodynamics for Chemical Engineres.*

Ch.E. 425. Engineering Materials 3-0-3.

Prerequisite: Chem. 333. Mr. Miller

Principles of physical metallurgy including binary phase diagrams and mechanical testing methods as applied to metallic materials. Production of iron, steel, and nonferrous metals is surveyed.

Text: Samans, *Engineering Metals and Their Alloys.*

Ch.E. 426. Engineering Materials 3-3-4.

Prerequisite: Ch.E. 425. Mr. Grubb

A study of the properties and application of carbon and alloy steels, cast irons, and nonferrous alloys. Some time is devoted to corrosion as an engineering problem and methods utilized in minimizing its effects. Laboratory work consists of metallographic observation of common ferrous and nonferrous alloys in various conditions.

Text: Samans, *Engineering Metals and Their Alloys; and Staff Notes.*

Ch.E. 427. Theoretical Physical Metallurgy 3-0-3.

Prerequisite: Ch.E. 327, or equivalent.

A study of the physical and mechanical properties of metals and alloys in the light of their structure.

Text: Doan, *Principles of Physical Metallurgy.*

Ch.E. 428. Metallography 2-3-3.

Prerequisite: Ch.E. 427 or 426, or equivalent.

The use of the microscope to study the influence of processing variables on the structure and properties of metals and alloys. Pyrometric instru-

mentation as applied to heat treating operations and thermal analysis of metals and alloys is also covered.

Text: Kehl, *Metallographic Laboratory Practice.*

Ch.E. 429. Corrosion and Protective Measures 3-0-3.

Prerequisites: Chem. 333 and Ch.E. 325 or 425.

The electrochemical theory of corrosion; recommended materials and protective measures for chemical processing equipment and for atmospheric, underground, underwater, and elevated temperature exposures.

Text: Speller, *Corrosion: Causes and Prevention.*

Ch.E. 431. Chemical Engineering Economics 3-0-3.

Prerequisite: Ch.E. 315. Mr. DallaValle

The student becomes familiar with the sources of economic data, and obtains experience in analyzing and presenting such data in order to determine the optimum economic plant location or equipment design. Materials of construction, maintenance, instrumentation, safety, cost estimation, labor, and overhead costs are discussed.

Text: Tyler, *Chemical Engineering Economics;* Trade literature.

Ch.E. 434. Chemical Plant Design 1-6-3.

Prerequisites: Ch.E. 413, 431, Mech. 332. Mr. Newton

The student becomes familiar with the selection of process equipment, design of special equipment, plant layouts and preparation of equipment, utilities, and production cost summaries. Current design methods are discussed, evaluated, and utilized.

Text: Perry, *Chemical Engineers Handbook.*

Ch.E. 443-444-445. Special Problems 0-3-1.

Prerequisite: Ch.E. 314.

The student is given an opportunity to develop initiative and to apply fundamental principles by doing semi-original laboratory investigation of a chemical engineering research nature.

Text: *None.*

Ch.E. 446. Comprehensive Problems 3-0-3.

Prerequisites: Chem. 333, Ch.E. 315, Mech. 332. Mr. DallaValle

The integration of the professional work of the first three years by means of a series of comprehensive problems.

Text: Arkin and Colton, *An Outline of Statistical Methods,* and Worthing and Gaffner, *Treatment of Experimental Data.*

Ch.E. 447. Comprehensive Problems 3-0-3.

Prerequisites: Ch.E. 446, 425, 413, 407, 419. Mr. DallaValle

Continuation of Ch.E. 446. Emphasis on Unit Operations.

Text: Perry, *Chemical Engineers Handbook.*

Ch.E. 448. Comprehensive Problems 3-0-3.

Prerequisites: Ch.E. 447, 426, 408, 420. Mr. Newton

A continuation of Ch.E. 447 with emphasis on thermodynamics.

Text: Perry, *Chemical Engineer's Handbook.*

GRADUATE COURSES OFFERED

Ch.E.	607-8-9	Chemistry and Technology of Cellulose	3-0-3
Ch.E.	613	Technology of Fine Particles	3-3-4
Ch.E.	619	Chemical Engineering Calculations	3-0-3
Ch.E.	622	Applied Chemical Kinetics	3-0-3
Ch.E	625-6	Physical Metallurgy	3-0-3
Ch.E.	627	Applied Physical Metallurgy	2-3-3
Ch.E.	646	Economic Analysis of Chemical Engineering Processes	3-0-3
Ch.E.	701-2-3	Seminar	1-0-0
Ch.E.	707-8-9	Organic Chemistry and Industry	3-0-3
Ch.E.	713	Fluid Flow	3-0-3
Ch.E.	714-15	Heat Transmission	3-0-3
Ch.E.	716-17-18	Advanced Unit Operations	3-0-3
Ch.E.	719-20-21	Chemical Engineering Thermodynamics	3-0-3
Ch.E.	724	Properties of Matter at Low Temperatures	3-0-3
Ch.E.	725	Special Topics in Thermodynamics	3-0-3
Ch.E.	732	Chemical Plant Design	1-6-3

(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)

SCHOOL OF CHEMISTRY

(Established in 1906)

Director*—Paul K. Calaway; *Acting Director*—Benjamin B. Wroth; *Professors*—Henry L. Edwards, Jack Hine, William M. Spicer, William S. Taylor, Wyatt C. Whitley; *Associate Professors*—William H. Eberhardt, Loyd D. Frashier, James K. Gladden, Erling Grovenstein, James A. Knight, Jr., R. Fred Sessions, James A. Stanfield, Allan C. Topp; *Assistant Professors*—Walter H. Burrows, Ervin Colton, Norman H. Horton, James T. W. Ross, A. Theodore Trimble, Jr.; *Graduate Assistants*—Robert E. Brooks, Harris Burns, Jr., Norbert W. Burske, Richard Butterworth, Marvin H. Cooper, James H. Diamond, James E. Feltham, William E. Gardner, Louis J. Grimm, Gordon P. Kane, John C. Lamb, Silas D. Lewis, Laurence W. Ross, Donald P. Schlueter, Gilbert L. Steiner, Fennell R. Thomasson, Edwin G. Vassian; *Secretary*—Mary Mell Fleming; *Chemical Technician*—Mrs. W. C. Thibadeau; *Machinist*—Harry K. Grant.

General Information

Included in the School are:

1. The courses in chemistry required in the various engineering curricula.
2. A curriculum leading to the degree of Bachelor of Science in Chemistry.
3. Graduate courses and research leading to the degree of Master of Science in Chemistry.
4. Graduate courses and research leading to the degree of Doctor of Philosophy in Chemistry.

The degree of Bachelor of Science in Chemistry will be awarded upon the completion of the following prescribed courses and 41 quarter hours of elective work. No objective course will be given for less than six applicants. A student must have had the prerequisites for any course he elects.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	107-8-9	General Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-3	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*A student majoring in Chemistry will be required to take M.L. 101-2-3 during the Junior year and therefore will be required to schedule S.S. 105-6-7 or another language during the Freshman year.

*Acting Director, Engineering Experiment Station.
**On leave

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	214-5	Analytical Chemistry	2-6-4	2-6-4	....
Chem.	331	Physical Chemistry	....	....	3-0-3
Chem.	334	Physical Chemistry Laboratory	....	....	0-3-1
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
		Totals	18-14-21	18-14-21	19-11-21

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	310-1-2	Organic Chemistry	3-6-5	3-6-5	3-6-5
Chem.	332-3	Physical Chemistry	3-0-3	3-0-3	....
Chem.	335-6-7	Physical Chemistry Laboratory	0-3-1	0-3-1	0-3-1
Chem.	400	Physical Chemistry	....	....	3-0-3
M.L.	101-2-3	Elementary German	3-0-3	3-0-3	3-0-3
Electives			- - 7	- - 7	- - 6
		Totals	9-9-19	9-9-19	9-9-18

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	403	Physical Chemistry	....	3-0-3	....
Chem.	405-6	Instrumental Analysis	....	1-6-3	1-6-3
Chem.	408	Organic Analysis	1-12-5	....	....
Chem.	434-5-6	Advanced Inorganic Chemistry	3-0-3	3-0-3	3-0-3
Chem.	442	Industrial Chemistry	....	....	3-0-3
Chem.	443-4	Organic Reactions	....	3-0-3	3-0-3
Chem.	450	Chemical Bibliography	2-0-2	....	....
Electives			- - 9	0-0-6	- - 6
		Totals	6-12-19	10-6-18	10-6-18

Electives

Not less than 15 hours must be selected from nonspecialized courses other than the physical sciences and mathematics.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Chem. 101, 102, 103. General Chemistry 3-3-4.

Prerequisite: Entrance Requirements. Mr. Taylor, Mr. Topp and Staff

A lecture and laboratory study of the fundamental laws and theories of Chemistry with abundant descriptive matter included to illustrate them. This course includes an introduction to qualitative analysis.

Texts: *To be selected.*

Chem. 107, 108, and 109. General Chemistry 3-3-4.

Mr. Spicer

Prerequisites: Chem. 107, Satisfactory Placement Examination; Chem. 108, Chem. 107 or C or better in Chem. 101; Chem. 109, Chem. 108 or B or better in Chem. 102.

This series of courses is designed for those students planning to pursue advanced courses in chemistry. The approach is more quantitative and less descriptive than in Chem. 101, 102, and 103.

Texts: Pauling, *College Chemistry;* Malm and Frantz, *College Chemistry in the Laboratory;* Spicer, Taylor, and Clary, *General Chemistry Problems*

Chem 211. Introduction to Analytical Chemistry 4-0-4.

Mr. Topp and Mr. Whitley

Prerequisites: Chem. 103 with a minimum grade of C, and Math. 102.

A classroom study of the laws, theories and reactions of analytical chemistry.

Texts: Curtman, *Introductions to Semi-Micro Qualitative Analysis;* Hamilton and Simpson, *Calculations of Analytical Chemistry.*

Chem. 212, 213. Analytical Chemistry 1-9-4.

Prerequisites: Chem. 211. Mr. Whitley and Mr. Edwards

A classroom and laboratory study of the laws, theories and reactions of analytical chemistry. Practice work in inorganic reactions and the identification of positive and negative ions. The quantitative determinations will be selected to illustrate typical analytical procedures.

Texts: Kolthoff and Sandell, *Textbook of Quantitative Inorganic Analysis;* Hamilton and Simpson, *Calculations of Analytical Chemistry.*

Chem. 214, 215. Analytical Chemistry 2-6-4.

Prerequisites: Chem. 109, or Chem. 103 with a grade of B or better.

Mr. Whitley and Mr. Edwards

A classroom and laboratory study of the laws, theories, and techniques of analytical chemistry. Problem work is stressed.

Texts: Kolthoff and Sandell, *Textbook of Quantitative Inorganic Analysis;* Hamilton and Simpson, *Calculations of Analytical Chemistry.*

Chem. 307, 308, 309. Organic Chemistry 3-3-4.

Prerequisite: Chem. 103. Mr. Stanfield and Mr. Horton

A study of the various classes of organic compounds. The laboratory work is similar to Chem. 310, Chem. 311, Chem. 312 but not as extended.

Texts: Wertheim, *Textbook of Organic Chemistry;* Adams and Johnson, *Laboratory Experiments in Organic Chemistry.*

Chem. 310, 311, 312. Organic Chemistry 3-6-5.

Prerequisite: Chem: 103 or Chem. 109. Mr. Wroth and Mr. Hine

The principal classes of organic compounds, aliphatic and aromatic, are studied. The laboratory work includes the preparation of typical compounds and the study of their properties.

Texts: Fieser and Fieser, *Textbook of Organic Chemistry;* Adams and Johnson, *Laboratory Experiments in Organic Chemistry.*

Chem. 331, 332, 333. Physical Chemistry 3-0-3.

Prerequisites: Chem. 215, Phys. 208, Math. 202.

Mr. Spicer, Mr. Sessions and Mr. Frashier

Physico-chemical properties of matter in the gaseous, liquid and solid states; solutions; equilibrium, kinetics and thermodynamics of chemical reactions, electrochemistry.

Text: Daniels, *Outlines of Physical Chemistry.*

Chem. 334, 335, 336. Physical Chemistry Laboratory 0-3-1.

Prerequisites: To be taken concurrently with or following Chem. 331, 332, 333. Mr. Eberhardt and Staff

Text: Eberhardt, *Physical Chemistry Laboratory Notes.*

Chem. 337. Physical Chemistry Laboratory Problems 0-3-1.

Prerequisites: Chem. 332. Mr. Eberhardt and Staff

Advanced experiments in physical chemistry.

Text: Eberhardt, *Physical Chemistry Laboratory Notes.*

Chem. 400. Physical Chemistry 3-0-3.

Prerequisite: Chem. 333. Mr. Spicer and Staff

Conductance, ionic equilibria, physical properties and structure.

Text: Daniels, *Outline of Physical Chemistry.*

Chem. 403. Physical Chemistry 3-0-3.

Prerequisite: Chem. 434. Mr. Eberhardt and Mr. Frashier

A study of the relation and atomic and molecular structure to the physical properties of matter and the nature of chemical bonding.

Text: Pauling, *Nature of the Chemical Bond.*

Chem. 405-6. Instrumental Analysis 1-6-3.

Prerequisite: Chem. 333. Mr. Edwards, Mr. Spicer and Mr. Whitley

This is an introductory course in both the theory and practice of modern instrumental methods; spectroscopy, polarography, colorimetry, microscopy, polarimetry, measurement of hydrogen ion concentration.

Texts: Chamot & Mason, *Handbook of Chemical Microscopy, Volume I;* Harley and Wiberley, *Instrumental Analysis.*

Chem. 408. Characterization of Organic Compounds 1-12-5.

Prerequisites: Chem. 216, Chem. 312. Mr. Calaway and Mr. Horton

The methods of identification of compounds and characteristic groups are studied.

Text: Shriner and Fuson, *Systematic Identification of Organic Compounds.*

Chem. 420. Colloid Chemistry 3-3-4.

Prerequisite: Chem. 333. Mr. Topp

Lectures, recitation, and laboratory work on the preparation, properties, and practical application of colloidal substances.

Text: B. Jirgensons and Straumanis, *A Short Textbook of Colloid Chemistry.*

Chem. 431. Inorganic Preparations 0-12-4.

Prerequisite: Chem. 333. Mr. Edwards

This course is designed to acquaint the student with the apparatus and techniques used in the preparation of pure inorganic compounds.

Text: Walton, *Inorganic Preparations.*

Chem. 434, 435, 436. Advanced Inorganic Chemistry 3-0-3.

Prerequisite: Chem. 333. Mr. Frashier and Mr. Gladden

A classroom study of selected topics with emphasis on laws, principles and generalization; the periodic classifications, atomic structure, natural and artificial radioactivity, valence, complex compounds, and other topics.

Text: Moeller, *Inorganic Chemistry.*

Chem. 437, 438, 439. Special Problems 0-6-2.

Prerequisites: Chem. 216, Chem. 312. Staff

The instruction will be individual and will include library, conference, and laboratory work. The time will vary with the problem studied.

Text: *None.*

Chem. 442. Industrial Chemistry 3-0-3.

Prerequisite: Chem. 312. Mr. Horton

The Chemistry of the Process Industries is studied, as well as the orientation of the chemist in industry.

Text: Shreve, *Chemical Process Industries.*

Chem. 443, 444. Organic Reactions 3-0-3.

Prerequisite: Chem. 312. Mr. Grovenstein and Mr. Hine

A study of the scope and usefulness of several important synthetic reactions in organic chemistry.

Text: References.

Chem. 450. Chemical Bibliography 2-0-2.

Prerequisites: Chem. 216, Chem. 312 or their equivalent. Mr. Stanfield

A study of the chemical library with instruction in the use of chemical journals, reference books, and other sources of information.

Text: *Notes.*

GRADUATE COURSES OFFERED

Chem.	631-2	Organic Chemistry	3-0-3
Chem.	633-4-5	Reactivity, Mechanism, and Structure in Organic Chemistry	3-0-3
Chem.	637-8	Organic Preparations	0-6-2
Chem.	639	Organic Chemistry	3-0-3
Chem.	644-5	Molecular Structure and Chemical Principles	3-0-3
Chem.	651-2	Introduction to Electro-Chemistry	3-0-3
Chem.	655	Surface Equilibria	3-0-3
Chem.	661-2-3	Chemical Thermodynamics	3-0-3
Chem.	664-5-6	Advanced Inorganic Chemistry	3-0-3
Chem.	700	Master's Thesis	
Chem.	701-2-3	Seminar	1-0-0
Chem.	724	Applied Spectroscopy	1-6-3
Chem.	733-4	Organic Chemistry	3-0-3
Chem.	735-6	Special Topics in Organic Chemistry	3-0-3
Chem.	747-8-9	Organic Chemistry	3-0-3
Chem.	757	Chemical Kinetics	3-0-3
Chem.	761	Special Topics in Physical Chemistry	3-0-3
Chem.	762	Chemical Principles	3-0-3
Chem.	764	Statistical Thermodynamics	3-0-3
Chem.	767-8	Principles of Quantum Mechanics	3-0-3
Chem.	780-1-2	Molecular Spectra	3-0-3
Chem.	800	Doctor's Thesis	

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

SCHOOL OF CIVIL ENGINEERING

(Established in 1896)

Director—Robert E. Stiemke; *Professors*—Carl E. Kindsvater, Richard King, Radnor J. Paquette, George F. Sowers; *Associate Professors*—Marion R. Carstens, Werner N. Grune, James H. Lucas, Harry C. Saxe, Frederick W. Schutz, Jr.; *Assistant Professors*—Ray K. Chalfant, Jr., Don B. Jones, Richard B. Pool, Arthur R. White; *Instructor*—George M. Jacobs; *Secretary*—Eleanor R. Kluge; *Laboratory Technician*—Homer J. Bates.

General

The civil engineer conceives, designs and builds projects coordinating and utilizing natural and human resources for urban and regional development. He works in the following broad fields of specialization within the profession: structural and construction engineering, hydraulic engineering, sanitary engineering, transportation, soils engineering, municipal and regional engineering and management, surveying and mapping.

The functional phases of civil engineering are research and development, planning and design, construction, and operation and maintenance. In addition to specific civil engineering courses, the curriculum provides a broad training in the physical and social sciences and selected subjects from the other engineering professions.

Of the specialized fields in civil engineering, sanitary engineering is unique in its background and training requirements. For this reason the sanitary engineering option is offered as described below.

It is not the purpose of the four-year curriculum to cover in detail all that is known or considered in the profession or in any one of its branches. Rather, emphasis is placed on fundamental laws and concepts to enable the student to attack any problem in a logical manner and to draw conclusions from principles and facts. Better students are urged to do graduate work.

Satisfactory completion of the four-year curriculum leads to the degree of Bachelor of Civil Engineering.

Plant and Equipment

The Civil Engineering Building contains modern classrooms, laboratories and drafting rooms. The hydraulics and fluid mechanics laboratory is well-equipped for undergraduate and graduate teaching and for research. It is one of the outstanding laboratories in the country.

Other laboratories are completely equipped for undergraduate and graduate teaching and research in the following: highway materials, masonry building materials, sanitary engineering, soil mechanics, stress analysis, and surveying and mapping.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
C.E.	201-2	Surveying	2-6-4	2-6-4	....
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Mech.	301	Applied Mechanics	....	....	2-0-2
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
		Totals	18-14-21	18-14-21	18-8-19

C.E. 203. Surveying Camp, 4 weeks during summer. For 6 hours credit. (See course description)

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
C.E.	301	Civil Engineering Practices	1-6-3	....	....
C.E.	308	Materials of Construction	....	2-6-4	....
C.E.	321	Fluid Mechanics I	....	3-3-4	....
C.E.	323	Fluid Mechanics II	....	....	3-0-3
C.E.	320	Fluid Mechanics Laboratory	....	....	0-3-1
C.E.	305-6	Structural Analysis I, II	....	3-0-3	3-0-3
C.E.	415	Sanitary Engineering I	....	....	3-3-4
C.E.	431	Hydrology	....	....	3-0-3
Geol.	201	General Geology	3-0-3	....	....
Geol.	202	General Geology Laboratory	0-3-1	....	....
Mech.	302-3	Applied Mechanics	2-0-2	3-0-3	....
Mech.	304	Applied Mechanics (Graphic Statics)	0-3-1	....	....
Mech.	331-2	Mechanics of Materials	3-0-3	2-0-2	....
M.E.	340	Elements of Heat Power	4-3-5	....	....
M.E.	353	Materials Laboratory	....	0-3-1	....
Electives*			3-0-3	3-0-3	3-0-3
		Totals	16-15-21	16-12-20	15-9-18

*If Advanced Air or Military is one of the electives, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
C.E.	406	Reinforced Concrete Design.....	2-3-3	....	....
C.E.	407	Metal Structural Design.....	2-3-3	....	....
C.E.	408	Structural Design	....	4-6-6	....
C.E.	409	Soil Mechanics and Foundations	4-3-5	....	....
C.E.	416	Sanitary Engineering II.....	3-3-4	....	....
C.E.	424	Transportation Engineering	....	4-6-6	....
C.E.	434	Civil Engineering Seminar.....	....	....	1-0-1
E.E.	330	Choice and Use of Electrical Devices	....	3-3-4	....
Ec.	329	Survey in Business Law.....	....	....	3-0-3
I.E.	425	Engineering Economy	....	....	3-0-3
Eng.	315	Public Speaking	....	....	3-0-3
Electives*		.....	3-0-3	3-0-3	3-0-3
		Totals 14-12-18		14-15-19	13-0-13**

*If Advanced Air or Military is one of the electives, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

**Students who are exempt from C.E. 203, surveying camp, take C.E. 303 plus 2 credits of electives. See course description for C.E. 203.

Sanitary Option

Men electing the Sanitary Option will substitute other courses for certain courses required in the regular civil engineering curriculum as follows:

Required Courses in Sanitary Option

JUNIOR YEAR

P.H.	201	Animal Biology	3-4-4
P.H.	307	General Bacteriology	3-4-4

SENIOR YEAR

P.H.	320	Water and Sewage Chemistry.....	2-6-4
P.H.	321	Water and Sewage Chemistry.....	2-6-4
P.H.	411	Sanitation	3-0-3
C.E.	419	Water Treatment	3-3-4
C.E.	423	Sewage and Industrial Waste Treatment.....	3-3-4
		Elective	2

Civil Engineering Courses Omitted in Sanitary Option

JUNIOR YEAR

M.E.	340	Elements of Heat Power.....	4-3-5
Mech.	303	Applied Mechanics	3-0-3

SENIOR YEAR

C.E.	424	Transportation Engineering	4-6-6
C.E.	409	Soil Mechanics and Foundations.....	4-3-5
C.E.	203	Surveying Camp	2-6-6
E.E.	330	Choice and Use of Electrical Devices.....	3-3-4

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

C.E. 201. Plane Surveying 2-6-4.

Prerequisites: Math. 101, 102. Mr. Lucas and Staff

The theory and practice of plane surveying as applied to topographic, land, and construction surveys; the care and use of surveying instruments.

Text: Davis and Kelly, *Short Course in Surveying.*

C.E. 202. Route Surveying 2-6-4.

Prerequisite: C.E. 201. Mr. Lucas

Reconnaissance, preliminary, location and construction surveys for routes; computations of curves and earthwork; introduction to photogrammetry.

Text: Rubey, *Route Surveying.*

C.E. 203. Surveying Camp, 4 weeks camp during summer*. 6 hours credit.

Prerequisites: C.E. 201, 202. Staff

Topographic, geodetic, route and construction surveys, including the use of photogrammetry; astronomical observations for co-ordinates.

*This course will normally be scheduled between the Sophomore and Junior years. However, it can be scheduled later. It is required of all Civil Engineering students except as follows:

(a) Students in the Sanitary Option.

(b) Students who graduate under the Cooperative Plan and students who graduate under the Regular Navy R.O.T.C. program. These students may substitute C.E. 303 plus 2 credits of electives in place of C.E. 203.

C.E. 204. Elementary Surveying 1-3-2.

Prerequisites: Math. 101, 102. For non-C.E. students. Staff

The use and maintenance of the level, transit and chain; surveying principles as applied to construction surveys and mechanical layout.

Text: Davis and Kelly, *Short Course in Surveying.*

C.E. 205. Elementary Surveying 0-3-1.

Prerequisites: Math. 101, 102. For non-C.E. students. Staff

Because of similarity of content this course should not be scheduled for credit, if credit in C.E. 204 has been earned.

Simple field exercises in the use of the level, transit and chain.

Text: Davis and Kelly, *Short Course in Surveying.*

C.E. 301. Civil Engineering Practices 1-6-3.

Prerequisites: Drawing 102, Eng. 103, Math. 103, Junior standing or instructor's permission. Mr. Stiemke and Staff

Civil engineering drawing and lettering; graphical representation; com-

putations; reports and correspondence. The laboratory periods are for supervised computation and drafting.

Texts: French and Turnbull, *Lessons in Lettering, Book II;* Gieseke, Mitchell, Spencer, *Technical Drawing* or French, *Engineering Drawing;* notes.

C.E. 303. Advanced Surveying 2-6-4. Not offered in Winter Quarter.
Prerequisites: C.E. 201, 202. Mr. Lucas
For C.E. students exempt from C.E. 203, Surveying Camp.
Topographic, geodetic and construction surveys; municipal surveys and mapping; astronomical observations for co-ordinates; principles of photogrammetry.
Text: Rayner, *Advanced Surveying.*

C.E. 305. Structural Analysis I 3-0-3.
Prerequisites: Mech. 301, 304, 331. Corequisite: Mech. 332.
Mr. Chalfant and Staff
Determination of forces and moments resulting from fixed and moving load systems on statically determinate structures; emphasis placed on influence lines.
Text: Shedd and Vawter, *Theory of Simple Structures.*

C.E. 306. Structural Analysis II 3-3-4.
Prerequisites: C.E. 305, Mech. 332. Mr. Saxe and Staff
Introduction to the analysis of statically indeterminate structures. The moment area theorems; virtual work; slope deflection equations and moment distribution. Applications to beams, frames and trusses. The laboratory period is for supervised computation.
Text: Williams, *Analysis of Statically Indeterminate Structures.*

C.E. 308. Materials of Construction 2-6-4.
Prerequisite: Junior Standing. Mr. Paquette and Mr. Saxe
Physical properties, manufacture, fabrication, specifications and use of engineering materials. The laboratory periods are for making tests and reports on construction materials such as cement, aggregates, concrete, bituminous materials and building products.
Text: Bateman, *Materials of Construction.*

C.E. 320. Fluid Mechanics Laboratory 0-3-1.
Prerequisite or corequisite: C.E. 323. Restricted to C.E. students.
Mr. Carstens
Experiment, demonstration and analysis of basic fluid phenomena and exercise in laboratory techniques.
Text: *Laboratory Manual.*

C.E. 321. Fluid Mechanics I 3-3-4.
Prerequisite: Mech. 302. Mr. Kindsvater and Staff
Elementary mechanics of fluids with emphasis on analysis. Fluid statics; fluid kinematics, including use of flow nets; equations of motion; energy equation; momentum principle; principles of dynamic similitude. The laboratory period is for supervised computation.
Text: Rouse and Howe, *Basic Mechanics of Fluids.*

C.E. 323. Fluid Mechanics II 3-0-3.
Prerequisite: C.E. 321. Mr. Carstens
Continuation of C.E. 321. Fluid measurements; uniform and non-uniform flow in open channels; principles of selection and performance of pumps and turbines.
Text: Streeter, *Fluid Mechanics.*

C.E. 324. Elements of Fluid Mechanics 3-3-4.
Prerequisites: Mech. 302, M.E. 320 or equivalent. For non-C.E. students. Required of I.E. and Power option E.E. seniors. Mr. Jones and Staff
Elementary mechanics of compressible and incompressible fluids in a single comprehensive course. Fluid statics; flow of ideal and real fluids; impulse-momentum principle; flow of incompressible fluids in pipes and open channels; fluid measurements. The laboratory period is for lecture, laboratory demonstration and supervised computation.
Text: Vennard, *Elementary Fluid Mechanics.*

C.E. 400. Reinforced Concrete Design 3-0-3.
Prerequisite: C.E. 406. For students in Architecture, Options I and II. Mr. Schutz and Staff
Foundations; two-way slab; flat slab; two-cycle moment distribution applied to building frames.
Text: Large, *Basic Reinforced Concrete Design.*

C.E. 406. Reinforced Concrete Design 2-3-3.
Prerequisite: C.E. 305 or Mech. 336. Corequisite: C.E. 306.
Mr. Pool and Staff
The application of transformed sections, bending, bond and shear stresses and web-reinforcement to the design of simple and continuous beams, floor slabs and columns; direct stress and bending in columns; applications to engineering structures. The laboratory period is for supervised design problems.
Text: Large, *Basic Reinforced Concrete Design.*

C.E. 407. Metal Structural Design 2-3-3.
Prerequisite: C.E. 305. Mr. Chalfant and Staff
Principles of design of tension and compression members, beams, riveted and welded connections; use of modern timber connectors; application of principles to the design of simple trusses and other structures. The laboratory period is for supervised design problems.
Texts: Williams and Harris, *Structural Design in Metals;* American Institute of Steel Construction, *Steel Construction Manual;* National Lumber Manufacturers Association, *National Design Specifications.*

C.E. 408 Structural Design 4-6-6.
Prerequisites: C.E. 406, 407. Mr. Saxe and Staff
Continuation of C.E. 406 and 407. Integrated design of structures in metals, concrete and timber; bridges, foundations, abutments, floor systems, building frames, eccentrically loaded members and connections. The laboratory periods are for supervised design problems.
Texts: Same as for C.E. 406 and 407, plus A.C.I. *Manual of Standard Practice for Detailing Reinforced Concrete Structures.*

C.E. 409. Soil Mechanics and Foundations 4-3-5.
Prerequisite: Mech. 331, C.E. 301 or equivalent, C.E. 308 or Arch. 322-23-24. Mr. Sowers and Mr. Pool
An introduction to soils engineering. Origin and composition of soils; physical properties of soils as affecting engineering design and construction; soil sampling. Mechanics of soil masses and applications to design of footings, foundations, retaining walls and similar structures; construction of fills, subgrades and other soil structures. The laboratory period is for making soil tests.
Texts: Sowers, *Introductory Soil Mechanics and Foundations; Laboratory Manual.*

C.E. 412. Applied Soil Mechanics 1-3-2. Spring Quarter.
Prerequisite: C.E. 409. Mr. Sowers
The application of soil mechanics principles to problems in design. Planning of soil investigations, foundation capacity by field and laboratory tests, design of retaining structures. The laboratory period is for problems in design.
Text: Terzaghi and Peck, *Soil Mechanics in Engineering Practice.*

C.E. 413. Structural Analysis III 2-3-3.
Prerequisite: C.E. 306. Mr. Chalfant
Qualitative and quantitative influence lines and their relationship to design; curves of maximum stress; further consideration of indeterminate structures, including Maxwell's reciprocal relationships, moment distribution, column analogy and work methods. The laboratory period is for supervised computation.
Text: Shedd and Vawter, *Theory of Simple Structures.*

C.E. 414. Advanced Structural Design 2-3-3.
Prerequisite: C.E. 408. Mr. Pool
Study of beams having variable cross sections; limit design and plastic theory; semi-rigid connections; prestressed concrete; tall building analysis and design; introduction to experimental stress analysis.

C.E. 415. Sanitary Engineering I 3-3-4.
Prerequisite: Chem. 103. Corequisite: C.E. 321.
Mr. King and Mr. Stiemke
Introduction to sanitary engineering and sanitation; the engineering theory and the public health, legal and economic factors involved in the quantity, quality and principles of treatment works for water, sewage and industrial wastes. The laboratory period is for demonstration of laboratory examinations and inspection trips.
Text: Steel, *Water Supply and Sewerage.*

C.E. 416. Sanitary Engineering II 3-3-4.
Prerequisite: C.E. 431. Corequisite: C.E. 323.
Mr. King and Mr. Grune
Sources of public water supplies; the design and construction of works for the collection and distribution of water and for the collection of sanitary and storm sewage. The laboratory period is for supervised design problems and inspection trips.
Text: Same as for C.E. 415.

C.E. 419. Water Treatment 3-3-4.

Prerequisite: C.E. 415. Mr. King and Mr. Grune

Quality and conditioning of municipal and industrial water supplies; clarification, softening, filtration, disinfection, corrosion control, and miscellaneous treatment. The laboratory periods are for design, supervised problems and inspection trips.

Text: Fair and Geyer, *Water Supply and Waste-Water Disposal.*

C.E. 423. Sewage and Industrial Waste Treatment 3-3-4.

Prerequisite: C.E. 415. Mr. King and Mr. Grune

The theory and principles of sewage and industrial waste treatment; units and operation of treatment plants. The laboratory periods are for design, supervised problems and inspection trips.

Text: Same as C.E. 419.

C.E. 424. Transportation Engineering 4-6-6.

Prerequisites: C.E. 202, C.E. 308. Mr. Paquette

The history, economics, design and construction of roads and highways; urban and rural traffic problems; the fundamentals of rail and water transportation. The laboratory periods are for making tests and reports on bituminous and other highway materials and for supervised design problems.

Text: Ritter and Paquette, *Highway Engineering* and notes.

C.E. 426. Highway Economics 3-0-3.

Prerequisite: C.E. 424. Mr. Paquette

The economics of highway construction, operation and maintenance; methods of financing.

C.E. 428. Construction Methods 3-0-3.

Prerequisite: Senior standing. Staff

Construction methods and equipment; use of construction materials; inspection; building codes.

Text: Huntington, *Building Construction;* trade literature and notes.

C.E. 429. Construction Planning 2-3-3.

Prerequisite: C.E. 428 or instructor's permission. Staff

Job organization and management; estimating; cost accounting; preparation of bids. The laboratory is for supervised problems.

C.E. 431. Hydrology 3-0-3.

Prerequisite: Junior standing. Mr. Jones and Staff

The occurrence and movement of water on and below the surface of the earth, emphasizing engineering applications to the control and utilization of surface and underground waters; elementary meteorology; precipitation, evaporation and runoff; infiltration and groundwater; hydrograph analysis; data collection.

Text: Wisler and Brater, *Hydrology.*

C.E. 433. Applied Hydraulics 3-0-3.

Prerequisites: C.E. 323, C.E. 431. Mr. Kindsvater and Mr. Carstens

Practice in the analysis and solution of hydraulics problems associated with the design of civil engineering structures. Typical exercises: stability of hydraulic structures; forces determined by flow net analysis; design of flood-control outlets, stilling basins, spillways, canals, culverts, pipe systems, etc.

C.E. 434. Civil Engineering Seminar 1-0-1.

Prerequisite: Senior standing. Mr. Stiemke

Oral and written student reports and discussions on current civil engineering projects and problems.

Text: ICS Staff, *Agreements and Specifications.*

C.E. 444. Special Problems. 1 Credit.

C.E. 445, 446. Special Problems. 2 Credits.

Prerequisite: Senior standing. Staff

Minor research or special problems involving analytical or experimental investigations to develop student initiative and technique under general supervision.

Text: *None.*

GRADUATE COURSES OFFERED

C.E.	605	Dock, Harbor and Shore Structures	3-0-3
C.E.	609	Advanced Soil Mechanics of Foundations	3-3-4
C.E.	611	Advanced Soil Mechanics	3-3-4
C.E.	612	Theory and Practice of Soil Construction	3-3-4
C.E.	613	Reinforced Concrete Structures I	3-3-4
C.E.	614	Structural Planning	3-0-3
C.E.	615	Structural Research Techniques	2-6-4
C.E.	621	Indeterminate Structural Theory I	3-3-4
C.E.	622	Indeterminate Structural Theory II	3-0-3
C.E.	625-6	Steady Flow in Open Channels I and II	2-3-3
C.E.	627	Steady Flow in Enclosed Conduits	3-0-3
C.E.	630	Engineering Hydrodynamics	3-0-3
C.E.	632	Water Power Engineering	3-0-3
C.E.	633-4	Intermediate Fluid Mechanics I and II	3-0-3
C.E.	635	Design and Construction of Airports	2-3-3
C.E.	636-7-8	Highway Transportation, I, II and III	2-3-3
C.E.	639-40	Sanitary Engineering Design I and II	3-3-4
C.E.	641	Concrete Mix Design	2-3-3
C.E.	642	Asphalt Mix Design	1-3-2
C.E.	644	Industrial Waste Treatment and Disposal	3-3-4
C.E.	700	Thesis	
C.E.	701-2-3	Seminar	1-0-0
C.E.	704-5-6	Special Problems	Arranged
C.E.	711-12	Designs of Steel and Timber Structures	2-6-4
C.E.	714	Reinforced Concrete Structures II	2-6-4
C.E.	715	Prestressed Concrete Structures	3-0-3
C.E.	716	Structural Dynamics	3-0-3
C.E.	725	Theoretical and Applied Soil Mechanics	3-6-5
C.E.	726	Physical Properties of Soils	3-6-5

(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)

SCHOOL OF ELECTRICAL ENGINEERING

(Established in 1896)

Director—Benjamin J. Dasher; *Professors*—*Martial A. Honnell, Frank O. Nottingham, Jr., **Domenico P. Savant, Edward R. Weston; *Associate Professors*—David L. Finn, F. Kenneth Hurd, Howard L. McKinley, William J. McKune, Edward E. Perkins, Ashford W. Stalnaker; *Assistant Professors*—Daniel C. Fielder, Donald W. Fraser, Paul T. Hutchison, Kendall L. Su, Thomas M. White; *Instructors*—John M. Bailey, Jr., John C. Cole, Jr., Arthur Hagedorn, John M. Wallace, Jr., Jack C. Wilson; *Secretaries*—Mrs. Elmira M. Martin, Mrs. Marjory M. Street; *Mechanic*—Raleigh M. Ford.

General

The curriculum is planned to give comprehensive training in the fundamental sciences of chemistry, physics, mathematics, and applied mechanics, in addition to courses in electrical engineering. It includes courses that give a working knowledge and appreciation of other important branches of engineering, as well as subjects of a non-technical and cultural nature.

Basic courses in the elements of electrical engineering are given in the sophomore year and courses in electronics, circuits and direct current machinery are given by the end of the junior year. Two options are offered in the senior year, one in electrical power engineering and the other in communications and electronics. Both options require the same courses in alternating current machinery, industrial electronics and electrical transients. The specialized subjects in each option are described below. In nearly all courses laboratory work supplements theory. Both options lead to the degree of Bachelor of Electrical Engineering.

Electrical Power Engineering Option

Students desiring to specialize in the generation, distribution and utilization of electric power should select this option. The specialized courses offered for this option deal with the theoretical principles and practical aspects of such subjects as electrical machine design, illumination, fluid mechanics, heat power engineering, and semi-automatic and automatic control of electrical machinery.

Communications and Electronics Option

Students desiring to specialize in radio, electronics, telephony, television, etc., should select this option. The specialized courses offered for this option deal with the theoretical principles and practical aspects of such subjects as wave filters, antennas and radiation, telephony and telegraphy, amplitude and frequency modulation, high frequency equipment and television.

*On leave
**Professor Emeritus

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
E.E.	205-6	Elements of Elec. Engineering	....	2-3-3	2-3-3
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
S.S.	204	Economics	3-0-3	....	....
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Totals	19-8-20	18-11-20	18-11-20

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
E.E.	301-2-3	A-C Circuits	3-3-4	3-3-4	3-3-4
E.E.	310	D-C Machinery	3-6-5	....	....
E.E.	318-324	Engineering Electronics	....	3-3-4	3-3-4
E.E.	342	Electrical Measurements	....	....	3-3-4
Eng.	315	Public Speaking	3-0-3	....	....
Math.	305-6	Differential Equations	3-0-3	3-0-3	....
M.E.	320	Thermodynamics	....	....	4-0-4
Mech.	301-2	Applied Mechanics	2-0-2	2-0-2	....
Mech.	331-2	Mechanics of Materials	....	3-0-3	2-0-2
Elective*			3-0-3	3-0-3	3-0-3
		Totals	17-9-20	17-6-19	18-9-21

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Electrical Power Engineering Option

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
C.E.	321	Fluid Mechanics	....	3-3-4	....
E.E.	401-2-7	A-C Machinery	3-6-5	3-6-5	3-3-4
E.E.	408	Electrical Control Systems	....	....	3-3-4
E.E.	422	Industrial Electronics	3-3-4	....	....
E.E.	441	Illumination	....	3-3-4	....
E.E.	442	Electrical Design	....	....	3-3-4
E.E.	445	Electrical Transients	3-0-3	....	....
E.E.	448	Electrical Power Trans.	....	....	3-3-4
Eng.	321	Technical English	....	3-0-3	....
M.E.	332	Elementary Heat Power Engr.	3-0-3	....	....
M.E.	354	Heat Power Laboratory	....	0-3-1	....
Elective*			3-0-3	3-0-3	3-0-3
		Totals	15-9-18	15-15-20	15-12-19

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

Communications and Electronics Option

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
E.E.	401-2-7	A-C Machinery	3-6-5	3-6-5	3-3-4
E.E.	422	Industrial Electronics	...	3-3-4	...
E.E.	428-29-30	Communication Engineering	3-3-4	3-3-4	3-3-4
E.E.	432	Communication Circuits	3-3-4	...	...
E.E.	433	Electric Fields	3-0-3	...	...
E.E.	436	U-H-F Techniques	...	...	3-3-4
E.E.	445	Electrical Transients	...	...	3-0-3
Eng.	321	Technical English	...	3-0-3	...
Elective*			3-0-3	3-0-3	3-0-3
		Totals	15-12-19	15-12-19	15-9-18

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

E.E. 205. Elements of Electrical Engineering 2-3-3.

Prerequisite: Physics 207. Mr. White

An introduction to the theory of circuit analysis. Definitions of voltage, current, charge and lumped circuit elements. Equilibrium equations for resistance circuits and methods for their solution. Lectures, recitations, computing and laboratory periods.

Text: Timbie and Bush, *Principles of Electrical Engineering.*

E.E. 206. Elements of Electrical Engineering 2-3-3

Prerequisite: Physics 208. Mr. White

An introduction to the theory of electric and magnetic fields.

Text: Timbie and Bush, *Principles of Electrical Engineering.*

E.E. 301. Alternating-Current Circuits 3-3-4.

Prerequisites: E.E. 205, Math. 305 or parallel. Mr. Su

Single-phase circuits. Lectures, recitations, computing and laboratory periods.

Text: Guillemin, *Introductory Circuit Theory*

E.E. 302. Alternating-Current Circuits 3-3-4.

Prerequisite: E.E. 301. Mr. Su

Coupled circuits, polyphase circuits, balanced and unbalanced. Lectures, recitations, computing and laboratory periods.

Text: Kerchner and Corcoran, *A-C Circuits.*

E.E. 303. Alternating-Current Circuits 3-3-4.

Prerequisite: E.E. 302. Mr. Weston

Wave analysis, non-sinusoidal waves and symmetrical components. Lectures, recitations, computing and laboratory periods.

Text: Kerchner and Corcoran, *A-C Circuits.*

E.E. 310. Direct-Current Machinery 3-6-5.

Prerequisite: E.E. 206. Mr. Stalnaker

The construction, operation, characteristics and application of direct-current generators and motors. Lectures, recitations, computing and laboratory periods.

Text: Siskind, *Direct Current Machinery. Laboratory Notes.*

E.E. 315. Mechanical Plant of Buildings 3-0-3.

Prerequisite; Senior Arch. Standing. Not to be scheduled for credit if credit for E.E. 330 has been earned. Mr. McKinley

This course deals with the wiring and the selection of lighting equipment for buildings.

Text: Gay and Fawcett, *Mechanical and Electrical Equipment for Buildings.*

E.E. 316. Applied Electricity 3-0-3.

Prerequisite: Physics 208. Non-electrical Engineering Students. Not to be scheduled for credit if credit for E.E. 310, E.E. 320, or E.E. 330 has been earned. Mr. Hagedorn and Staff

A study of the elementary principles of direct-current machinery and alternating-current circuits.

Text: Gray and Wallace, *Principles and Practice of Electrical Engineering.*

E.E. 317. Applied Electricity 2-3-3.

Prerequisite: E.E. 316. Non-electrical Engineering Students. Not to be scheduled for credit if credit for E.E. 321 or E.E. 330 has been earned. Mr. Wallace and Staff

The study of the elementary principles of alternating-current machinery. Lectures, recitations, computing and laboratory periods.

Text: Gray and Wallace, *Principles and Practice of Electrical Engineering. Laboratory Notes.*

E.E. 318. Engineering Electronics 3-3-4.

Prerequisite: E.E. 301. Mr. Hurd and Staff

A basic study of the control of free electrons, electron emission, electron currents in gases and electron tubes. Lectures, recitations, computing and laboratory periods.

Text: Corcoran and Price, *Electronics.*

E.E. 320. Applied Electricity 3-3-4.

Prerequisite: Physics 208. Non-electrical Engineering Students. Not to be scheduled for credit if credit for E.E. 310, E.E. 316 or E.E. 330 has been earned. Mr. Perkins and Staff

The study of the principles of electric and magnetic circuits and the principles of operation of direct-current machinery. Lectures, recitations, computing and laboratory periods.

Text: Schilling, *Theory and Application of Electrical Engineering.*

E.E. 321. Applied Electricity 4-3-5.

Prerequisite: E.E. 320 Non-electrical Engineering Students. Not to be scheduled for credit if credit for E.E. 317 or E.E. 330 has been earned. Mr. Hagedorn and Staff

This course comprises a study of the elementary principles of single and polyphase circuits and the principles of alternating-current machinery. Lectures, recitations, computing and laboratory periods.

Text: Schilling, *Theory and Application of Electrical Engineering.*

E.E. 322. Industrial Electronic Control 3-3-4.

Prerequisites: E.E. 317 or E.E. 321. Non-electrical Engineering Students. Mr. Nottingham

A study of electronic and control devices applied to electrical machinery. Lectures, recitations, computing and laboratory periods.

Text: Benedict, *Introduction to Industrial Electronics.*

E.E. 324. Engineering Electronics 3-3-4.

Prerequisite: E.E. 318. Mr. Finn and Staff

An analytical study of rectifier systems, the equivalent plate circuit, simple amplifiers, oscillators, thyratron control and phototube circuits. Lectures, recitations, computing and laboratory periods.

Text: Corcoran and Price, *Electronics.*

E.E. 330. Choice and Use of Electrical Devices 3-3-4.

Prerequisite: Physics 208. Non-electrical Engineering Students. Not to be scheduled for credit if credit for E.E. 310, E.E. 315, E.E. 316, E.E. 317 or E.E. 320 has been earned. Mr. White and Staff

A study of fundamental alternating-current circuit theory, wiring practices, and principles, applications, and control of alternating-current machines. Lectures, recitations, computing and laboratory periods.

Text: Pumphrey, *Electrical Engineering.*

E.E. 342. Electrical Measurements 3-3-4.

Prerequisite: E.E. 302. Mr. Nottingham and Staff

This course includes the modern methods of measuring resistance, current, capacity, inductance and iron losses, and the calibration of electrical instruments. Lectures, recitations, computing and laboratory periods.

Text: Marshall, *Measurements in Electrical Engineering, Vols. I and II.*

E.E. 401. Alternating-Current Machinery 3-6-5.

Prerequisites: E.E. 303 and E.E. 310. Mr. Stalnaker and Staff

The construction, operation, characteristics and application of alternators and transformers. Lectures, recitations, computing and laboratory periods.

Text: Puchstein and Lloyd, *A-C Machines; Laboratory Notes.*

E.E. 402. Alternating-Current Machinery 3-6-5.

Prerequisite: E.E. 401. Mr. Stalnaker and Staff

The construction, operation, characteristics and application of induction motors and synchronous motors. Lectures, recitations, computing and laboratory periods.

Text: Puchstein and Lloyd, *A-C Machines; Laboratory Notes.*

E.E. 407. Alternating Current Machinery 3-3-4.

Prerequisite: E.E. 402. Mr. Weston

The construction, operation, characteristics and application of sychronous converters, single phase motors and special motors. Lectures, recitations, computing and laboratory periods.

Text: Puchstein and Lloyd, *A-C Machines; Laboratory Notes.*

E.E. 408. Electrical Control Systems 3-3-4.

Prerequisite: E.E. 407 or parallel. Mr. Weston

This course deals with systems of electromagnetic and electronic control of electrical machinery, including such special machines as the amplidyne, rototrol, amplistat, selsyn, and electronic drive. Lectures, recitations, computing and laboratory periods.

Text: R. W. Jones, *Electric Control Systems. Laboratory Notes.*

E.E. 422. Industrial Electronics 3-3-4.

Prerequisites: E.E. 303 and E.E. 324. Mr. Nottingham

Theory and operating characteristics of electronic power conversion and industrial electronic control devices. Laboratory and problem work are included.

Text: Lecture Notes.

E.E. 428. Communication Engineering 3-3-4.

Prerequisites: E.E. 324 and Math. 306. Mr. McKinley

An analytical study of radio circuit components and of audio-and radio-frequency amplifiers. Lectures, recitations, computing and laboratory periods.

Texts: Arguimbau, *Vacuum Tube Circuits.* Terman, *Radio Engineers' Handbook.*

E.E. 429. Communication Engineering 3-3-4.

Prerequisite: E.E. 428. Mr. McKinley

An analytical study of oscillators, power radio-frequency amplifiers, modulators and detectors. Lectures, recitations, computing and laboratory periods.

Texts: Arguimbau, *Vacuum Tube Circuits.* Terman, *Radio Engineers' Handbook.*

E.E. 430. Communication Engineering 3-3-4.

Prerequisite: E.E. 429. Mr. McKinley

A study of transmitting and receiving systems including antennas. Lectures, recitations, computing and laboratory periods.

Texts: Arguimbau, *Vacuum Tube Circuits.* Terman, *Radio Engineers' Handbook.*

E.E. 431. Telephony 3-0-3.

Prerequisite: E.E. 303. Mr. Hagedorn

The principles of telephone apparatus and circuits, carrier currents, etc.

Text: To be selected.

E.E. 432. Communication Circuits 3-3-4.

Prerequisite: E.E. 303. Mr. Finn

A mathematical study of transmission lines and electric filters for use at low and high frequencies. Lectures, recitations, computing and laboratory periods.

Text: Ware and Reed, *Communication Circuits.*

E.E. 433. Electric Fields 3-0-3.

Prerequisite: E.E. 303. Mr. Fielder

A study of static and dynamic electric fields including an introduction to vector analysis.

Text: Skilling, *Fund. of Electric Waves.*

E.E. 434. High-Frequency Measurements 3-0-3.

Prerequisites: E.E. 428 or parallel. Mr. Hutchison

A study of the techniques employed in the measurement of voltage, current, power, inductance, resistance and capacitance at audio and radio frequencies.

Text: Terman, *Measurements in Radio Engineering.*

E.E. 436. Ultra-High-Frequency Techniques 3-3-4.

Prerequisites: E.E. 433 and E.E. 430 or parallel. Mr. Fraser

A study of the techniques employed in ultra-high-frequency radio systems. Lectures, recitations, computing and laboratory periods.

Text: Reich, *Microwave Theory and Techniques.*

E.E. 441. Illumination 3-3-4.

Prerequisite: E.E. 303. Mr. McKinley

A course dealing with the principles of illuminating engineering and photometers. Lectures, recitations, computing and laboratory periods.

Text: Boast, *Illumination Engineering.*

E.E. 442. Electrical Design 3-3-4.

Prerequisites: E.E. 407 or parallel. Mr. Perkins

Design problems of various types of apparatus involving the electric and magnetic circuits. Lectures and computing periods.

Text: Kuhlmann, *Design of Electrical Apparatus.*

E.E. 445. Electrical Transients 3-0-3.

Prerequisites: E.E. 303 and Math. 306. Mr. Cole

An analytical study of the transient state in d-c and a-c circuits.

Text: Ware and Town, *Electrical Transients.*

E.E. 448. Electrical Power Transmission 3-3-4.

Prerequisite: E.E. 401. Mr. McKune

The electrical characteristics of transmission-line circuits. Lectures, recitation, computing and laboratory periods.

Text: Stevenson, *Power System Analysis*

E.E. 451. Applications of Electrical Apparatus in Industry 3-0-3.

Prerequisite: E.E. 407 or parallel. Mr. Weston

Considerations governing the selection of electrical equipment for industrial purposes.

Text: *None.*

E.E. 452-453-454. Special Problems 0-3-1.

Prerequisite: Senior E.E. Standing. Staff

Special engineering problems will be assigned to the student according to his needs and capabilities.

Text: *None.*

GRADUATE COURSES OFFERED

E.E.	605	Symmetrical Components	3-3-4
E.E.	606	Advanced Alternating-Current Machinery	3-0-3
E.E.	607	Advanced Alternating-Current Machinery	3-3-4
E.E.	608	Power System Relaying	3-3-4
E.E.	609	Digital Control Circuits	3-0-3
E.E.	619	Automatic Control Instrumentation	3-3-4
E.E.	620	Electromechanical Control Devices	3-3-4
E.E.	621	Automatic Control Systems	3-3-4
E.E.	622-3	Advanced Electrical Transients	3-0-3
E.E.	624	Advanced Electrical Measurements	3-3-4
E.E.	628	Transmission Lines	3-3-4
E.E.	629	Communication Circuits	3-3-4
E.E.	630	Communication Circuits	3-0-3
E.E.	631	Communication Circuits	3-3-4
E.E.	634	Antenna Systems	4-3-5
E.E.	639	Electromagnetic Theory	3-0-3

E.E.	640	Wave Guides and Cavity Resonators	3-0-3
E.E.	650	Power System Stability	3-0-3
E.E.	662-3-4	Advanced Network Theory	3-3-4
E.E.	700	Master's Thesis	
E.E.	701-2-3	Seminar	1-0-0
E.E.	704-5-6	Special Problems ..... Credit to be arranged	
E.E.	716	Traveling-Wave Voltages Due to Lightning	3-0-3
E.E.	729	Advanced Electronics	5-0-5
E.E.	734-5-6	Oscillators	3-0-3
E.E.	742-3-4	Network Analysis and Feedback Amplifier Design	3-3-4
E.E.	745-6-7	Advanced Electromagnetic Theory	3-3-4
E.E.	750	Advanced Analysis of Automatic Control Systems	4-3-5
E.E.	753-4-5	Advanced Communication Theory	3-0-3
E.E.	800	Doctor's Thesis	

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

DIVISION OF ENGINEERING DRAWING AND MECHANICS

Director—William B. Johns, Jr.; *Professor in Charge of Drawing*—Bryan L. Brown; *Professors*—Francis M. Hill, Roy K. Jacobs; *Associate Professors*—Frank Bogle (Retired), Francis C. Bragg, Joseph C. Durden, Jr., Knowles H. Henley, Jakob Mandelker; *Assistant Professors*—*James H. Armstrong, Luther A. Beale, Ishmael L. Ellis, Frank M. Rowan (Retired), Harry C. Savage, Jr.; *Instructors*—William G. Bullock, James R. Gray, Ira E. Wilks; *Lecturers*—William C. Bliss, J. P. Edgerly, Everard M. Heim, Fremont B. Hodson, William J. Larson, Leroy P. Sterling; *Secretary*—Rebecca Joyce Stewart.

Engineering Drawing

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Students are expected not to purchase or use drawing instruments except as approved by the Division of Engineering Drawing and Mechanics.

Draw. 101. Engineering Drawing 0-6-2.

Prerequisite: None. Mr. Savage and Staff

Topics of study include lettering; the use of instruments; orthographic projection; auxiliary views; conventions; and pictorial drawings.

Text: French and Vierck, *Engineering Drawing; and Departmental Work Sheets.*

Draw. 102. Engineering Drawing 0-6-2.

Prerequisite: Draw. 101. Mr. Bragg and Staff

Topics of study include sections; drawing conventions; dimensions; pictorial representation; shop processes; technical sketching; working drawings; pencil drawing on vellum; ink tracing on cloth; reproduction processes.

Text: French and Vierck, *Engineering Drawing; and Departmental Work Sheets.*

Draw. 103. Engineering Drawing 0-6-2.

Prerequisite: Draw. 102. Staff

Topics of study include technical sketching; threads and fastenings; working drawings; working drawings from assemblies; assemblies from working drawings.

Text: French and Vierck, *Engineering Drawings; and Departmental Work Sheets.*

Draw. 106. Industrial Management Drawing 0-6-2.

Prerequisite: Draw. 102. Mr. Bragg and Staff

Topics of study include working drawings and specifications; theory and construction of charts and graphs used to present technical data and trends in business.

Text: Schmid, *Handbook of Graphic Presentation.*

*Leave of Absence.

Draw. 109. Applied Descriptive Geometry 0-6-2.

Prerequisite: Drawing 102. Mr. Durden and Staff

Topics of study include the solution of problems involving points, lines, and planes by use of auxiliary views and by revolution methods; simple intersections; development of surfaces; an introduction to warped surfaces. Practical applications are emphasized.

Text: Warner, *Applied Descriptive Geometry; and Departmental Work Sheets.*

Draw. 203. Applied Descriptive Geometry 0-3-1.

Prerequisite: Draw. 109. Mr. Durden and Staff

Topics of study include the intersection of surfaces; warped surfaces. Practical applications are emphasized.

Text: Warner, *Applied Descriptive Geometry; and Departmental Work Sheets.*

Engineering Mechanics

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Mech. 301. Applied Mechanics 2-0-2.

Prerequisites: Physics 207 and Math. 201. Staff

Topics of study include elements of statics; laws of equilibrium applied to machines and structures; laws of friction applied to simple machines. Problems solved analytically and graphically.

Text: To be selected.

Mech. 302. Applied Mechanics 2-0-2.

Prerequisites: Mech. 301; Mech. 331, or concurrently; Math. 202. Staff

Topics of study include elements of rectilinear and curvilinear kinematics, kinetics of particles, and kinetics of translation of bodies with applications.

Text: To be selected.

Mech. 303. Applied Mechanics 3-0-3.

Prerequisites: Mech. 302, Math. 203. Staff

Topics of study include kinematics and kinetics of rotating bodies; kinematics and kinetics of plane motion; work, power, energy, and relationships.

Text: To be selected.

Mech. 304. Applied Mechanics 0-3-1.

Prerequisite: Mech. 301. Staff

Topics of study include composition and resolution of forces and couples; equilibrium criteria; analysis of simple structures, trusses and cranes; friction; string polygon through three points; emphasis on graphical solutions but computations may be required.

Text: *Notes of Instructor and Departmental Work Sheets.*

Mech. 331. Mechanics of Materials 3-0-3.

Prerequisites: Math. 202; Mech. 301, or concurrently with consent of Director. Staff

Topics of study include simple stresses and strains; shear and bending moment diagrams; flexure stresses in beams; shafts; columns.

Text: Timoshenko and MacCullough, *Elements of Strength of Materials, 3rd Edition.* Staff

Mech. 332. Mechanics of Materials 2-0-2.

Prerequisites: Mech. 301, 331. Staff

Topics of study include deflection of beams; longitudinal shear; combined stresses.

Text: Timoshenko and MacCullough, *Elements of Strength of Materials, 3rd Edition.* Staff

Mech. 333. Mechanics of Materials 3-0-3.

Prerequisites: Mech. 332, Math. 203. Staff

Topics of study include statically indeterminate cases of beams, including continuous beams, by moment area methods, by theorem of three moments, and by moment distribution methods; unsymmetrical bending; introduction to analysis by energy methods.

Text: Timoshenko and MacCullough, *Elements of Strength of Materials,* 3rd edition.

Mech. 336. Mechanics of Materials 3-0-3.

Prerequisites: Mech. 301, Mech. 331. Mr. Mandelker and Staff

Topics of study include longitudinal shearing stresses in beams due to change in bending moment; deflection of beams by double integration and moment area methods; solution of statically indeterminate beams by the moment-area method, theorem of three moments, and moment-distribution method.

Text: Timoshenko and MacCullough, *Elements of Strength of Materials,* 3rd edition.

Mech. 421. Mechanical Vibrations 3-0-3.

Prerequisites: Mech. 303, 333 or equivalent, and Math. 305.
Mr. Hill and Staff

Topics of study include kinematics of vibration; the single degree of freedom system, without and with damping; two degrees of freedom; several degrees of freedom; vibration of beams and shafts; critical speeds.

Text: Thompson, *Mechanical Vibrations.*

Mech. 430. Advanced Statics 3-0-3.

Prerequisite: Mech. 303. Mr. Brown

General case of forces in the plane and in space with applications to frameworks and space structures; theorems of graphic statics; cables; virtual work.

Text: *Lectures and references.*

GRADUATE COURSES OFFERED

Mech.	603	Applied Vibration	3-0-3
Mech.	604	Dynamics	3-0-3
Mech.	610	Theory of Small Oscillations	3-0-3
Mech.	615	Gyroscopic Motion and Devices	3-0-3
Mech.	620	Theory of Experimental Stress Analysis	2-3-3
Mech.	621	Elastic Energy Theory	3-0-3
Mech.	633	Advanced Mechanics of Materials	3-0-3
Mech.	635	Advanced Strength of Materials	3-0-3
Mech.	639	Introductory Elasticity	3-0-3
Mech.	640	Introductory Photoelasticity	1-6-3
Mech.	643	Photoelasticity	1-6-3
Mech.	652	Theory of Flat Plates	3-0-3
Mech.	653	Theory of Elastic Stability	3-0-3
Mech.	660	Elasticity	3-0-3
Mech.	670	Relaxation Methods in Engineering	1-6-3
Mech.	700	Master's Thesis	
Mech.	701-2-3	Seminar	1-0-0
Mech.	704-5-6	Special Problems in Engineering Mechanics	....

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

DEPARTMENT OF ENGLISH

Department Head—Andrew J. Walker; *Professors*—Edwin H. Folk, Glenn W. Rainey, Hal C. Brown; *Associate Professors*—Henry W. Adams, David B. Comer, III, Edward Foster, W. Richard Metcalfe, James B. Haman; *Assistant Professors*—Tom F. Almon, Ralph Bergamo, Milton Chaikin, B. Bernard Cohen, A. Frank Hamrick, Alton A. Hobgood, Samuel C. Ketchin, William B. Mullen, Karl M. Murphy, Ralph R. Spillman, Richard Wiegand; *Instructors*—Roy E. Aycock, Robert L. Banks, J. L. Dillard, David A. Nelson, John P. O'Neill, John W. Platt, Jr., James E. Sisson; *Drama Director*—Mrs. Mary Nell Ivey; *Secretary*—Helen Auclair.

Comment on Freshmen and Other English Courses

Since ability to use correct and clear English prose is fundamental for all successful study, the English courses of the freshman year are directed mainly toward this end. At the beginning of the term all incoming freshmen are required to take a placement test in English. Students found to be deficient in the fundamentals of English composition will be assigned to a non-credit course.

Every student is required to have credit for three quarters of Freshman English. Students in more advanced classes whose work in composition is unsatisfactory may be required to take any composition courses, in part or as a whole, even though they have credit for the course.

In addition to the composition course for freshmen, the department offers courses in communication, written and oral, to students in the junior and senior classes.

Such courses are highly utilitarian. The department, however, requires of all sophomores, and offers to juniors and seniors, courses of a more general nature, in several fields of literature, which seek for the student a broadening of the intellect and a deepening of the emotions.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Eng. 10. Remedial English 3-0-0.

Prerequisite: None. Mr. Walker and Staff; under direction of Mr. Haman.

Review of essentials of grammar, punctuation, and composition. Recitation, written exercises, quizzes, short themes.

Text: Emery and Wight, *Practice in Writing.* A dictionary acceptable to the department.

Eng. 50. Reading for Speed and Comprehension 2-0-0.

Prerequisite: None. Mr. Walker and Staff

Mechanics of reading, exercises in increasing speed and improving comprehension. Recitation, tests, and individual practice.

Text: Cosper and Griffin, *Toward Better Reading Skill.*

Eng. 101. Composition and Rhetoric 3-0-3.

Prerequisite: None

Mr. Walker and Staff; under direction of Mr. Haman

Reading and writing short units of composition efficiently and effectively, with emphasis on the discovery and practice of purposive organization.

Texts: Wykoff and Shaw, *The Harper Handbook;* Davis and Hummel, *Readings For Opinion.* A dictionary acceptable to the department.

Eng. 102. Composition and Rhetoric 3-0-3.

Prerequisite: Eng. 101.

Mr. Walker and Staff; under direction of Mr. Haman

Reading and writing longer units of composition efficiently and effectively, with emphasis on relationship of ideas, paragraphs, logical structure and conclusions.

Texts: Wykoff and Shaw, *The Harper Handbook;* Davis and Hummel, *Readings For Opinion.* A dictionary acceptable to the department.

Eng. 103. Composition and Rhetoric 3-0-3.

Prerequisite: Eng. 102.

Mr. Walker and Staff; under direction of Mr. Haman

Reading and writing fully expanded purposive units of composition efficiently and effectively, with emphasis on effective sentences, vocabulary, straight thinking.

Texts: Wykoff and Shaw, *The Harper Handbook;* Hummel & Huntress, *Analysis of Propaganda.* A dictionary acceptable to the department.

Eng. 110. Vocabulary Building 3-0-3.

Prerequisite: None. Mr. Mullen

Development of a useful vocabulary required in technical and scientific courses and general reading. Recitation, written exercises, individual practice and research, quizzes.

Text: *None.*

Eng. 131-2-3. English for International Students 5-0-5.

Freshman year, consecutive quarters. Mr. Spillman, Mr. O'Neill

Admission by consent of the department.

A one-year course designed as an introduction to written and spoken English, stressing American pronunciation, idiomatic phrases, and language appropriate to basic social situations and customs of the American people.

Texts: Selected texts as announced.

Eng. 201. Survey of the Humanities 3-0-3.

Prerequisites: Eng. 101, 102, 103.

Mr. Walker and Staff; under direction of Mr. Folk

The contributions of several ancient writers to European culture. Lecture, quizzes, reports, collateral reading.

Text: Anderson and Warnock, *The World in Literature, Book 1, The Ancient Foundations.*

Eng. 202. Survey of the Humanities 3-0-3.
Prerequisite: Eng. 201.
Mr. Walker and Staff; under direction of Mr. Folk
The influences of the literature of the Middle Ages and of the Renaissance upon modern thought.
Text: Anderson and Warnock, *The World in Literature, Book 2, Centuries of Transition.*

Eng. 203. Survey of the Humanities 3-0-3.
Prerequisite: Eng. 202.
Mr. Walker and Staff; under direction of Mr. Folk
Introduction to contemporary literature through the study of modern poetry, drama, short stories, and novels.
Text: Hatcher, *Modern Drama;* Individual authors as announced.

Eng. 204. Creative Writing 3-0-3.
Prerequisite: English 103. Mr. Haman
Study and practice in several forms and methods of composition, with emphasis on effective writing. Recitation, quizzes, compositions.
Text: *The Atlantic Monthly.*

Eng. 221, 222, 223. Acting and Producing the Play 0-3-1.
Prerequisite: Admission by consent of instructor. Mrs. Ivey
Participation in the production of various kinds of plays, including the presentation of one play before an audience.

Eng. 231-2-3. Literature for International Students 5-0-5.
Sophomore year, consecutive quarters. Mr. Walker and Staff
Prerequisite: Eng. 131 or 103 and consent of department.
An introduction to American ideas as expressed in American literature, with continued training in writing and speaking the American language.
Texts: Selected texts as announced.

Eng. 301*. Modern Drama 3-0-3.
Prerequisite: Eng. 202. Mr. Walker
Dramatic theory and technique as illustrated by a number of modern playwrights. Lectures, reports, collateral reading, quizzes.
Text: Gassner, *A Treasury of the Theatre.*

Eng. 302. Shakespeare** 3-0-3.
Prerequisite: Eng. 202. Mr. Adams
A brief statement of the life and times of Shakespeare and a careful study of certain of his principal works. Lectures, reports, collateral reading, quizzes.
Text: Neilson, *The Complete Plays and Poems of Shakespeare.*

Eng. 303*. American Literature 3-0-3.
Prerequisite: Eng. 202. Mr. Foster and Mr. Cohen
Reading a few of our good writers for form and ideas.
Text: To be selected.

*May be substituted for Eng. 203.
**May be substituted for Eng. 202.

Eng. 304*. Contemporary Literature 3-0-3.
Prerequisite: Eng. 202. Mr. Haman
A careful study of major figures and movements in modern fiction.
Text: Neider, *Short Novels of the Masters.*

Eng. 305. The English Language 2-0-2.
Prerequisite: English 103. Mr. Walker
Study of the origin of the English language, its relation to other languages, and its differentiation and development into modern English and American. Lectures, quizzes, term paper.
Text: Robertson, *Development of Modern English.*

Eng. 315. Public Speaking 3-0-3.
Prerequisite: Eng. 203.
Mr. Walker and Staff; under direction of Mr. Rainey
Instruction in the basic principles of effective public speaking, with emphasis on practice and criticism. The course is conducted as a laboratory.
Text: Monroe, *Principles of Speech,* Brief Edition.

Eng. 321. Technical English 3-0-3.
Prerequisites: Eng. 103, 203. Mr. Walker and Staff
Study and practice of effective English in business letters, technical papers, engineering reports. Letters, reports, quizzes.
A student will not receive credit for both Eng. 321 and Eng. 325.
Texts: Gaum, Graves, and Hoffman, *Report Writing,* Third Edition; Murphy, *Modern Business Letters.*

Eng. 325. Business English 3-0-3.
Prerequisite: Eng. 203.
Mr. Walker and Staff, under direction of Mr. Metcalfe
Correctness and effectiveness in business English with emphasis on correspondence. Lectures, letters, business articles.
A student will not receive credit for both Eng. 321 and Eng. 325.
Text: Aurner, *Effective Communications in Business,* Third Edition.

*May be substituted for Eng. 203.

SCHOOL OF INDUSTRIAL ENGINEERING

(Established in 1945)

(Including a Program in Safety Engineering)

Director—Frank F. Groseclose; *Professors*—William N. Cox, Jr. and Robert N. Lehrer; *Associate Professors*—Robert M. Eastman, W. Dale Jones, Joseph J. Moder, Rocker T. Staton, Jr., and Raymond N. Trowbridge; *Assistant Professors*—*Harwell L. Boyd, Jr., and Winfield A. Brooks; *Lecturer*—John B. Day and Paul T. Eaton; *Secretary*—Mrs. Bernice Fowler.

General

The study of Industrial Engineering prepares a student for a successful career in the manufacturing, research and service industries. Based as it is on a broad engineering background, the professional courses taken in the last two years offer a perspective which enables the graduate to cope with complex problem situations encountered in modern industry and business.

The industrial or management engineer deals primarily with production in a manufacturing establishment. He is concerned with methods, organization, planning, coordination, equipment and personnel—all of the factors which play a role in the cost, quality and quantity of output. He deals with the top management, the engineering staff and the production force in achieving these goals.

New problems have arisen and new techniques have been developed during recent years which are peculiar to and characteristic of industrial engineering. These include the analysis of a proposed product with regard to the possible steps and sequences of operations involved in its manufacture, a selection of the most efficient machines to perform those operations, the layout of the plant and shops to provide for the flow of the product from one machine to another, organization of the material supply, avoidance or elimination of bottlenecks, together with the related problems of quality and cost control, testing, inspection and personnel relations.

Industrial engineering coordinates men, materials, machines, and methods, so as to solve problems met in the conversion, transformation and fabrication of raw materials into the products of industry.

The successful industrial engineer must possess special interests and abilities in the analysis of the human, technical, and cost problems of modern manufacturing. In addition, he must possess the essential personality and attributes of character which will enable him to work with and direct others in the planning and operation of manufacturing enterprises.

Industrial engineering is a loosely defined occupational area. In its restricted usage it is usually limited to production organization, planning and methods. It may include the training and direction of personnel, specifications and purchasing of materials, cost and sales control, health and safety programs, accounting systems and traffic management. In some instances

*On leave

this occupation embraces the management of construction of new industrial enterprises and large scale public works. It may also include consultation in the area of finance and economics as these relate to mergers, reorganization, large scale modernization or retooling, etc.

Since this occupational area is concerned with the management aspect of professional engineering, it bears a reasonably close relationship with the activities of those men performing administrative functions in any of the other branches of engineering. There is a similar relationship with the work of consulting engineers and in many cases with works managers or plant superintendents in large enterprises. The work of the industrial engineer is likewise related to that of executives, directors, owners or managers of large manufacturing enterprises, particularly in those areas in which engineering problems and methods are important, and in which the executive has an engineering background, through education and/or experience.

The successful completion of the curriculum leads to the degree of Bachelor of Industrial Engineering.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 mean 3 hours class, 3 hours laboratory, 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Draw.	103	Engineering Drawing	0-6-2	....	....
Ec.	201	Principles of Economics	....	....	3-0-3
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
M.E.	205	Welding Laboratory	....	0-3-1	....
M.E.	206	Pattern and Foundry Laboratory	....	0-3-1	....
M.E.	201	Machine Laboratory	....	....	0-3-1
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
ROTC	201-2-3	ROTC Training	3-1-2	3-1-2	3-1-2
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
		Totals	16-14-19	16-14-19	19-11-21

JUNIOR YEAR

NOTE: Under Quarters, 2-6-4 means 2 hours class, 6 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Ec.	202	Economic Principles and Problems	3-0-3	....	....
I.M.	336-7	Accounting & Cost Accounting	3-0-3	4-0-4	....
Ch.E.	325	Metallurgy	....	3-0-3	....
Eng.	321	Technical English	....	....	3-0-3
I.E.	304	Organization for Production	3-0-3	....	....
I.E.	306	Production Control	....	3-0-3	....
I.E.	339	Evaluations of Engrg. Data	3-0-3	....	....
I.E.	417	Motion and Time Study	....	....	3-6-5
Mech.	301-2	Applied Mechanics	2-0-2	2-0-2	....
Mech.	331-2	Mechanics of Materials	3-0-3	2-0-2	....
M.E.	320	Thermodynamics	....	4-0-4	....
M.E.	332	Heat Power Engineering	....	....	3-0-3
M.E.	367	Machine Design	....	....	4-3-5
Electives*			3-0-3	3-0-3	3-0-3
		Totals	20-0-20	21-0-21	16-9-19

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	315	Public Speaking	3-0-3	....	....
C.E.	324	Fluid Mechanics	3-3-4	....	....
E.E.	316-7	Applied Electricity	....	3-0-3	2-3-3
M.E.	354	Heat Power Laboratory	0-3-1	....	....
Psy.	401	Industrial Psychology	....	3-0-3	....
S.E.	401	Industrial Accident Control	....	....	3-0-3
I.E.	410	Industrial Surveys and Reports	1-3-2	....	....
I.E.	411-2	Seminar	1-0-1	....	1-0-1
I.E.	420	Cost & Production Estimating	....	3-0-3	....
I.E.	407	Factory Planning	....	....	2-3-3
I.E.	422	Job Evaluation & Wage Incentives	....	3-0-3	....
I.E.	424	Materials Handling	....	2-3-3	....
I.E.	425	Engineering Economy	3-0-3	....	....
I.E.	490	Legal & Ethical Phases of Engineering	....	....	3-0-3
Electives*			3-0-3	3-0-3	3-0-3
		Totals	14-9-17	17-3-18	14-6-16

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

I.E. 304. Organization for Production 3-0-3.

Prerequisite: Junior Standing, Ec. 201, or S.S. 204. Staff

The principles of organization and administration which are applicable to various engineering and industrial enterprises. An elective course for all engineering students.

Text: Bethel, Atwater, Stackman, and Smith, *Essentials of Industrial Management.*

I.E. 306. Production Control 3-0-3.

Prerequisite: I.E. 304 or concurrent. Mr. Cox and Mr. Eaton

A practical lecture course covering production control systems, work routing, dispatching, timekeeping, inventory control, stores, etc.

Texts: Alford, *Production Handbook;* O'Donnell, *Production Control.*

I.E. 311. Manufacturing Processes 3-0-3.

Prerequisite: Two quarters of shop laboratory. Staff

A survey of modern manufacturing processes and production methods.

Text: To be selected, visual aids and lecture notes.

I.E. 339. Evaluation of Engineering Data 3-0-3.

Prerequisite: Junior Standing. Mr. Moder and Staff

A study of the application of modern statistical techniques in the presentation and analysis of numerical engineering data including descriptive statistics covering graphic and numerical presentation of data, probability and sampling, confidence intervals, significance tests, and the basic concepts of statistical quality control.

Text: To be selected.

I.E. 402. Production Problems 3-0-3.

Prerequisite: Senior standing, I.E. 304 and instructor permission.
Mr. Brooks and Staff

A case method study of modern production plant problems. A wide variety of problems are used but stress is laid on the consideration of original and unusual cases.

Text: Cruickshank and Davis, *Cases in Management.*

I.E. 407. Factory Planning 2-3-3.

Prerequisite: I.E. 420 and 424 or instructor permission.
Mr. Brooks and Staff

The location, design, selection and layout of factory buildings and equipment.

Texts: Alford, *Production Handbook;* and Apple, *Plant Layout.*

I.E. 410. Industrial Surveys and Reports 1-3-2.

Prerequisites: Eng. 321, I.E. 304. Mr. Staton and Staff

A study of some of the problems which engineers encounter in investigating and reporting on various industrial operations.

Text: Staton and Groseclose, *Industrial Reports.*

I.E. 411-12. Seminar 1-0-1.

Prerequisite: Senior standing. Staff

To provide an hour for the Industrial Engineering students and faculty to join in discussions on current problems, professional responsibilities and opportunities.

Text: *None.*

I.E. 416. Motion and Time Study 2-3-3.

Prerequisites: Junior Standing; Non-Industrial Engineering Students.
Mr. Eaton

Principal aims and applications of time and motion study, job analysis, standardization, job and wage evaluation. Laboratory application and practice of the subject matter.

Text: Mundel, *Motion and Time Study Principles and Practices.*

I.E. 417. Motion and Time Study 3-6-5.

Prerequisite: Junior Standing and C or better average.
Mr. Jones and Mr. Lehrer

Principal aims and application of time and motion study, job analysis, standardization, job and wage evaluation. Laboratory application and practice of the subject matter given to a degree which enables a student to function as a junior time and motion study man in industry.

Text: Barnes, *Motion and Time Study.*

I.E. 420. Cost and Production Estimating 3-0-3.

Prerequisites: I.E. 416 or I.E. 417 and I.M. 337.
Mr. Brooks and Staff

A course in the development of estimating technique for tool and equipment costs, production rates, costs ratios, establishment of basic time charts, etc.

Text: Begeman, *Manufacturing Processes,* and Nordhoff, *Machine Shop Estimating.*

I.E. 422. Job Evaluation and Wage Incentives 3-0-3.

Prerequisite: I.E. 416 or I.E. 417. Staff

A course designed to give the student the principles used in establishing wage rates and salaries. The characteristics and objectives of different wage incentive plans and the design and analysis of incentive formulas and curves are considered.

Texts: Patton & Smith, *Job Evaluation,* and Louden, *Wage Incentives.*

I.E. 424. Materials Handling Equipment and Methods 2-3-3.

Prerequisites: I.E. 425, I.E. 416 or 417, Senior Standing.
Mr. Day and Staff

A combined lecture and laboratory course on modern material handling methods, systems, equipment, and control. Laboratory work covers layout of material handling systems for specific problems.

Text: Immers, *Materials Handling* and Lecturer's Notes.

I.E. 425. Engineering Economy 3-0-3.

Prerequisite: Senior Standing. Mr. Groseclose and Staff

Mathematics of investment; methods of financing; output and life of equipment; depreciation methods; elements of manufacturing costs; machine rates; economic selection of equipment, determination of the economic manufacturing lot.

Text: To be selected.

I.E. 439. Quality Control 3-0-3.
Prerequisite: I.E. 339 or Math. 417. Mr. Moder and Staff
This course covers the many problems associated with the specification of product quality and assembly tolerances and their control through the use of statistical charts. Also covered is the design and application of acceptance sampling plans for go, no-go, and continuous variable type of measurements.
Text: Grant, *Statistical Quality Control.*

I.E. 441. Sales Engineering 3-0-3.
Prerequisite: Senior standing Mr. Cox
A study of the problems involved in selling technical goods and services requiring engineering skill and knowledge in their application. Particular attention is given to the engineering application and service aspects of this work.
Text: Lester, *Sales Engineering.*

I.E. 451, 452, 453. Special Problems 0-3-1.
Senior Year, First, Second and Third Quarters.
Prerequisites: Senior Standing and Special Permission. Staff
The student is given an opportunity to develop initiative and to apply fundamental principles by doing semi-original laboratory or research work of an industrial engineering nature.
Text: None.

I.E. 490. Legal and Ethical Phases of Engineering 3-0-3.
Prerequisite: Senior standing. Mr. Cox and Staff
This course covers the subject of contracts, patents, copyrights and trademarks, agency, sales agreements, and engineering specifications. The engineer and his relations to the law, to the public and the ethics of his profession.
Text: Canfield and Bowman, *Business, Legal and Ethical Phases of Engineering.*

GRADUATE COURSES OFFERED

I.E.	601	Modern Industrial Organizations	3-0-3
I.E.	603	Methods of Industrial Engineering Research	3-0-3
I.E.	606	Materials Control	3-0-3
I.E.	611	Industrial Engineering	3-0-3
I.E.	613	The Design of Manufacturing Enterprises	3-0-3
I.E.	615	Transportation Cost Analysis	3-0-3
I.E.	616	Methods Analysis	3-0-3
I.E.	617	Advanced Motion and Time Study	3-0-3
I.E.	618	Wages, Salaries, and Incentives	3-0-3
I.E.	619	Quality Control	3-0-3
I.E.	620	Advanced Production Problems	3-0-3
I.E.	621	Collective Bargaining	3-0-3
I.E.	622	Job Evaluation	3-0-3
I.E.	624	Advanced Materials Handling	1-6-3
I.E.	625	Advanced Engineering Economy	3-0-3
I.E.	627	Sales Engineering	3-0-3
I.E.	700	Master's Thesis	
I.E.	701-2-3	Seminar	1-0-0
I.E.	704-5-6	Special Problems in Industrial Engineering	
I.E.	707	Product Design for Economical Production	3-0-3

Program in Safety Engineering

The development of new industrial processes and materials is rapidly increasing the requirements of industry, business and government for engineers with an understanding of accident-prevention and fire-control fundamentals, as well as highly-trained specialists in safety engineering.

To accomplish an awareness of the accident problems in the chosen field of each engineering student, the following courses are offered to supplement the information gained through the inclusion of appropriate safety materials in the content of other courses. The engineer is thus equipped to weigh safety considerations with those of strength, efficiency and economy in problems of design, construction and operation.

The development of the safety engineering specialist must necessarily be assigned to the graduate level, available only upon completion of a comprehensive undergraduate study program.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

S.E. 401. Industrial Accident Control 3-0-3.
Mr. Cox and Mr. Trowbridge

The evaluation of accident-control problems in industry; the elements of the industrial safety program and typical control measures.

Text: Blake, *Industrial Safety,* 2nd edition.

S.E. 402. Industrial Fire Prevention 3-0-3. Mr. Trowbridge

The consideration of industrial fire prevention and protection through design, construction, and layout of facilities, and the control of industrial operations and processes.

Text: Crosby, Fiske & Forster, *Handbook of Fire Protection.*

GRADUATE COURSES OFFERED

S.E.	612-13	Industrial Safety Engineering	3-0-3
S.E.	614	The Design of the Industrial Safety Program	3-0-3
S.E.	615	Industrial Fire Control	3-0-3
S.E.	616	Safety Standards in Industry	2-0-2
S.E.	618	Engineering Control of Industrial Health Hazards	3-0-3
S.E.	619-20	Method Analysis for Safety	1-6-3
S.E.	601-2	Design of Machinery Safeguards	1-6-3
S.E.	700	Master's Thesis	
S.E.	701-2-3	Seminar	
S.E.	704-5-6	Problems in Safety Engineering	

SCHOOL OF INDUSTRIAL MANAGEMENT

(Established in 1935)

Director—Hubert E. Dennison; *Professors*—Maurice R. Brewster, Alpheus R. Marshall, William J. Proctor, Noah Warren, Fred B. Wenn; *Associate Professors*— Ernest W. Aldredge, Walter S. Buckingham, J. Carlton Brown, Glenn W. Gilman, Roy A. James, Samuel Thompson; *Assistant Professors*—Everett R. Bollinger, John T. Etheridge, William A. Flinn, James W. Griffin, *George E. Maddox, William M. McCullough, Warren E. Moeller, James W. Sweeney; *Instructors*—Andrew J. Cooper, William T. Frames; *Part-time Assistant Professor*—LeRoy W. Barnes; *Part-time Instructors*—Robert C. Cauthorn, Howell E. Graham; *Graduate Assistants*—Harlan Carroll, Sidney Gold.

General Information

Industrial Management involves a knowledge of the policies and problems of business and industry. In order to acquaint the student with this subject, the courses in the school are logically divided into four main categories: Accounting and Financial Management, Marketing Management, Personnel Management and Production Management and Industrial and Production Economics.

Accounting and Financial Management requires a knowledge of keeping accounts, preparing statements and analyzing costs. It includes the problem of estimating capital requirements, means by which capital can best be raised, and the supervision of such funds. The courses in accounting, financing and income tax furnish the basis for this study.

Marketing Management involves a knowledge of how and where to distribute the finished product or service. It requires training of sales personnel and the creation of sales literature, analysis of the market with a view of determining the greatest potential sources of demand and the proper channels for distribution.

Personnel Management requires a knowledge of systems of selection, employment, promotion and effective plans of directing men at work.

Industrial Management students have the opportunity to take courses in psychology, English, mathematics, social sciences, as well as in most of the other schools and departments at the Georgia Institute of Technology. This opportunity enables students to broaden and intensify their studies.

The course leads to the degree of Bachelor of Science in Industrial Management.

Major Concentration Groups

1. Students taking the general course should select their electives mainly from courses in economics, marketing, personnel, finance, accounting and psychology.
2. Students planning to seek jobs in personnel management should take

*On leave

public health courses and select as part of their electives motion and time study psychology.

3. Those students who desire to prepare for positions in insurance should take such courses as insurance, psychology, M.E. 329 and 330, Ch.E. 325 and 328, C.E. 307, Arch. 322, 323 and 324.
4. Students who take the following courses will be prepared for positions as hospital managers: P.H. 201, 202, 307, 316, 411, and I.M. 460, 461, 462.
5. Students desiring to major in industrial and production economics should elect courses in economics and in those fields of engineering and science most closely related to the type of industry or business they intend to enter.
6. Industrial Management graduates who take the following courses will be prepared for positions as Sanitarians with the health services: P.H. 201, 202, P.H. 307, 316, P.H. 411.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-6	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Ec.	201-2-3	Economic Prin. and Problems	3-0-3	3-0-3	3-0-3
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
I.M.	245-6-7	Introductory Accounting	4-0-4	4-0-4	4-0-4
Phys.	211-2-3	Elem. Mechanics and Heat	4-0-4	4-0-4	4-0-4
*P.H.	201-2	General Zoology	3-4-4	3-4-4	....
Math.	210	Mathematics of Finance	....	....	3-0-3
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
		Totals	20-9-21	20-9-21	20-5-20

*15 hours of physical or chemical science and technology or 15 hours of calculus may be substituted for the Public Health requirements with the approval of the Director.

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Ec.	325-26-27	Business Law	3-0-3	3-0-3	3-0-3
I.M.	310-11	Marketing	3-0-3	3-0-3	....
I.M.	312	Sales Management	....	....	3-0-3
I.M.	313-14-15	Finance	3-0-3	3-0-3	3-0-3
I.M.	341-42	Cost Accounting	3-0-3	3-0-3	....
I.M.	343	Taxation	....	....	3-0-3
Eng.	315	Public Speaking	3-0-3	....	....
P.H.	307	General Bacteriology	....	3-4-4	....
P.H.	316	Industrial Hygiene	....	....	3-0-3
**Electives			6-0-6	3-0-3	6-0-6
		Totals	21-0-21	18-4-19	21-0-21

**At least 9 hours of the Junior and Senior electives must be selected from courses having an engineering designation, and a maximum of 18 hours may be selected from Military or Naval Science. If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
M.E.	206	Foundry Laboratory	0-3-1	....	....
M.E.	205	Welding Laboratory	....	0-3-1	....
I.M.	453-4	Labor Problems	3-0-3	3-0-3	....
I.M.	407-8	Personnel Management	....	3-0-3	3-0-3
I.M.	411-12-13	Management, Prin. and Prob.	3-0-3	3-0-3	3-0-3
I.M.	443	Investments	3-0-3	....	....
I.M.	447-48	Statistics	3-0-3	3-0-3	....
Eng.	325	Business English	....	....	3-0-3
**Electives			6-0-6	6-0-6	6-0-6
		Totals	18-3-19	18-3-19	15-0-15

**At least 9 hours of the Junior and Senior electives must be selected from courses having an engineering designation, and a maximum of 18 hours may be selected from Military or Naval Science. If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Ec. 201, 202, 203. Economic Principles and Problems 3-0-3.

Prerequisite: Eng. 102. Mr. Buckingham, Mr. Cooper, Mr. Etheridge, Mr. Flinn, Mr. Maddox, Mr. Gilman, Mr. Thompson.

This course opens with a study of the fundamental theory of economics and continues with a survey of our present economic system. It includes during the third quarter the application of economic principles to contemporary business and industrial problems.

Text: C. Lowell Harriss, *The American Economy.*

I.M. 245, 246, 247. Introductory Accounting 4-0-4.

Prerequisite: Sophomore standing. Mr. Bollinger, Mr. Cooper, Mr. Frames, Mr. Griffin, Mr. James, Mr. McCullough, Mr. Warren

This course runs throughout three quarters. The first part deals with

the theory of debits and credits, the construction of the trial balance, the profit and loss statement, and the balance sheet. During the course, accounting for a proprietorship, a copartnership, and a corporation are covered in detail in class and laboratory.

Text: Finney and Miller, *Principles of Accounting—Introductory.*

I.M. 307. Salesmanship 3-0-3.

Prerequisite: Junior standing. Mr. Aldredge, Mr. Dennison

This is a study of the means by which producers select, organize and train their personnel for purposes of distributing the manufactured product.

Text: Pederson & Wright, *Salesmanship—Principles and Practices.*

I.M. 310, 311. Marketing Management 3-0-3.

Prerequisite: Ec. 201 or equivalent.

Mr. Brewster, Mr. Flinn, Mr. James, Mr. Maddox

This course covers material that is descriptive of the marketing machinery used in distribution of manufactured products and deals specifically with the location and the assembling of raw materials for processing and the distribution of the finished product.

Text: Maynard and Beckman, *Principles of Marketing.*

I.M. 312. Distribution Management 3-0-3.

Prerequisite: 3 Hours in Marketing. Mr. Brewster, Mr. Flinn

In this course a study is made of the management of sales. It is a problem course covering all those aspects of distribution met with by distributing and manufacturing organizations.

Text: Maynard and Nolen, *Sales Management.*

I.M. 313, 314, 315. Corporation Finance 3-0-3.

Prerequisites: Ec. 203, I.M. 245. Mr. Buckingham, Mr. Cooper, Mr. Etheridge, Mr. Maddox, Mr. Wenn

A brief study of the suitability of the sole proprietorship, partnership, and corporation as business organizations, followed by an intensive study of the corporation. This study involves promotional investigation and organization, raising capital through sale of stock and bonds, working capital, surplus and dividend policies, combinations, receiverships and reorganizations.

Text: Guthman and Dougall, *Corporate Financial Policy.*

I.M. 316. Finance Survey for Engineers 3-0-3.

Prerequisite: Junior standing. Mr. Wenn, Mr. Buckingham

Designed to acquaint the student with the more popular types of business organizations, with special emphasis on the corporation, its organization, management and types of securities issued.

Text: Bonneville and Dewey, *Organizing and Financing Business.*

I.M. 317. Industrial Marketing 3-0-3.

Prerequisite: Junior standing. Mr. Brewster, Mr. Flinn

This course describes the methods used in distributing industrial goods. It is an elective for junior and senior engineering students.

Text: Maynard and Beckman, *Principles of Marketing.*

Ec. 325, 326, 327. Business Law 3-0-3.
Prerequisite: Junior standing. Mr. Dennison, Mr. Aldredge, Mr. Proctor, Mr. Thompson

This course covers during the first quarter the law of contracts, agency and negotiable instruments; during the second quarter a study is made of partnership and corporation law; during the third quarter, sales, property and bankruptcy law are studied.

Text: Dillavou and Howard, *Principles of Business Law.*

Ec. 329. Survey in Business Law 3-0-3.
Prerequisite: Junior or Senior Engineering standing. Mr. Proctor

In this course a study is made of those law cases which pertain strictly to legal questions arising out of engineering operations. It is designed for students who are not able to take a more extended course in business law.

Text: Dillavou and Simpson, *Law for Engineers and Architects.*

I.M. 336. Accounting Survey 3-0-3.
Prerequisite: Junior or Senior Engineering standing.
Mr. Warren, Mr. James

This is a brief survey of the analysis and the recording of business transactions, the preparation of financial statements and their interpretations.

Text: Noble and Niswonger, *Accounting Principles.*

I.M. 337. Cost Accounting 4-0-4.
Prerequisite: I.M. 336. Mr. Warren, Mr. James, Mr. Bollinger

A survey of the essentials of cost accounting. Emphasis is placed on the utilization of cost data and reports by management indicating management's control over industrial operations.

Text: Specthrie, *Basic Cost Accounting.*

I.M. 341, 342. Industrial Cost Accounting 3-0-3.
Prerequisite: I.M. 247. Mr. Bollinger, Mr. Griffin, Mr. Warren

This course deals with the application of cost analysis to manufacturing and distributing problems. Exercises are used to illustrate methods of compiling and analyzing materials, labor and manufacturing costs. Considerable time is given to the preparation of and interpretation of financial statements of industrial organizations as a means of exercising control.

Text: Neuner, *Cost Accounting.*

I.M. 343. Taxation 3-0-3.
Prerequisite: I.M. 247. Mr. Warren

This course covers federal and state tax accounting.

Text: Prentice-Hall, *Federal Tax Course.*

I.M. 347. Technique of Industrial Communication 3-0-3.
Prerequisite: Junior or Senior standing. Mr. Gilman

In this course, a study will be made of the basic techniques of communication as employed in industry by management, by employees and by the public. Internal and external functions of public relations are covered with emphasis on the application of practical media in achieving definite results.

Text: To be selected.

I.M. 349. Economics of Industrial Demand 3-0-3.
Prerequisite: Junior or Senior standing. Mr. Flinn
The objective of this course is to discover and point the way to wiser consumptive practice in industry. In it, utilization of fundamental economic principles will be made as a guide to action in industrial purchasing. Students having no extensive specialized training in economics may take the course. More advanced students in economics may pursue their study from the angle of demand. The purpose of the course is to give students in the School of Industrial Management and in the schools of engineering an opportunity to study the relations existing between sound purchasing and profitable production in an industrial enterprise.
Text: Stuart F. Heinritz, *Purchasing.*

I.M. 352. Industrial Economics Analysis 3-0-3.
Prerequisite: Junior or Senior standing. Mr. Buckingham
This is an intensive course in the economics of production cost, price determination, and income distribution as these are related to business fluctuations. The aim of the course is to give students of Industrial Management and engineering a comprehensive picture of the relationships which exist in a variety of types of industrial enterprises.
Text: To be selected.

I.M. 406. World Industries and Resources 3-0-3.
Prerequisite: Junior standing. Mr. Aldredge
This course represents the history, location, present standing and process technology of different types of American industry. It deals with economic trends in industry and the vocational opportunities which many of them offer to the student. Special emphasis will be placed upon new industries.
Text: Glover and Cornell, *The Development of American Industry.*

I.M. 407. Personnel Management Principles 3-0-3.
Prerequisite: Senior standing.
Mr. Marshall, Mr. Gilman, Mr. Sweeney
This is an introductory course dealing with the scope and development of personnel management, the instruments of personnel control, and principles of sound employee relations.
Text: Jucius, *Personnel Management.*

I.M. 408. Personnel Management Problems 3-0-3.
Prerequisite: I.M. 407. Mr. Marshall, Mr. Gilman, Mr. Sweeney
This course will concentrate on typical problems encountered by the personnel department, such as selection, training, and placement of workers, merit-rating and promotion, and development of good personnel techniques. Plant inspections, interviews, and contacts in the plant will be made. The course will be supplemented by the use of industrial films.
Text: Pigors & Myers, *Personnel Administration.*

I.M. 411, 412, 413. Industrial Management Principles and Problems 3-0-3.
Prerequisite: Senior standing.
Mr. Brown, Mr. Sweeney, Mr. Thompson
This is a three-quarter continuous course. The first part will deal with

the introduction to industrial management. The second part will deal with problems in industrial management. It will cover such subjects as plant organization and managing an industrial enterprise. The student will be required to make plant inspections singly and in groups to observe first-hand industrial organizations at work. Industrial films will be used to supplement the work.

Text: Knowles and Thompson, *Industrial Management,* Franklyn G. Moore, *Production Control,* and Folts, *Introduction to Industrial Management.*

I.M. 414. Public Finance 3-0-3.

Prerequisite: Junior standing. Staff

This course covers such subjects as public revenue, public expenditures, borrowing, the different forms of taxation, Federal and state.

Text: Shultz, *Public Finance.*

I.M. 439, 440. Principles and Problems of Accounting 3-3-4.

Prerequisite: Elective senior advanced accounting students.

Mr. Griffin, Mr. James, Mr. Warren

This course is a continuation of I.M. 237 and covers corporation accounting in detail. Much of the subject matter is composed of examination given by Certified Public Accounting Boards in the different states. A study is made of single entry bookkeeping.

Text: Finney, *Principles of Accounting.*

I.M. 443. Principles of Investment 3-0-3.

Prerequisites: I.M. 313, 314, or permission of instructor.

Mr. Wenn, Mr. Griffin

A study of the sources of financial information and its interpretation, the operation of stock exchanges, over-the-counter markets, and methods of underwriting. A study is also made of the various types of securities available for investment and tests to determine their investment quality.

Text: Jordan, *Investments.*

I.M. 445. Investment Analysis 3-0-3.

Prerequisite: I.M. 443. Mr. Wenn

This is a detailed study of various industries with a view to determining the probability of their future growth. Companies in each industry are studied; their management, financial condition and earning powers together with a current analysis of their stocks and bonds. Students may take either or both courses.

Text: Jordan, *Investments.*

I.M. 447, 448. Statistics 3-0-3.

Prerequisite: Senior standing. I.M. 447 (or equivalent) is a prerequisite to I.M. 448. Mr. Dennison, Mr. Gilman, Mr. Moeller

The first part of the course deals with the development and use of simple mathematical statistical formulae and their use and application. The second part of the course covers the principles of gathering, summarizing, and and interpreting quantitative data in the fields of economics, business and industry.

Text: Spurr, Kellogg and Smith, *Business and Economic Statistics.*

I.M. 449, 450. Insurance 3-0-3.
Prerequisite: Junior or Senior Elective. Mr. Dennison, Mr. Thompson
During the first part of the course a study is made of life insurance, while during the second part casualty and fire insurance are studied.
Text: Riegel and Miller, *Principles of Insurance.*

I.M. 453. Labor Problems 3-0-3.
Prerequisite: Junior or Senior standing.
Mr. Gilman, Mr. Marshall, Mr. Sweeney
The purpose of the course is to acquaint the student with the history, background, and present status of labor organizations and the methods used by labor organizations to achieve their objective together with a study of possible solutions for the labor-management problems.
Text: Reynolds, *Labor Economics and Labor Relations.*

I.M. 454. Labor Legislation and Its Application 3-0-3.
Prerequisite: I.M. 453. Mr. Gilman, Mr. Marshall, Mr. Sweeney
This course will cover the background of labor legislation and the constitutional background for such legislation. The legal status of labor organizations prior to 1935 will be considered. Study and analysis of National Labor Relations Act, Labor Management Relations Act, Fair Labor Standards Act, and other labor legislation. Present trends in labor legislation.
Text: Prentice-Hall, *Labor Course.*

I.M. 455, 456. Marketing Management Problems 3-0-3.
Prerequisite: I.M. 311. I.M. 455 prerequisite to I.M. 456.
Mr. Brewster, Mr. James, Mr. Maddox
This is a problem course in the field of marketing manufactured goods.
Text: McNair & Hansen, *Problems in Marketing.*

I.M. 458. Contemporary Unionism and Collective Bargaining 3-0-3.
Prerequisites: I.M. 453, I.M. 454. Mr. Marshall
This is a study of the organization and structure of unions in the United States and includes such subjects as union policies and aims, the theory of collective bargaining, collective bargaining procedures and techniques, an analysis of union-management contracts with attention given to typical clauses such as provisions for grievance machinery, technological changes, lay-offs, and union security
Text: To be selected.

I.M. 459. Industrial Relations in the Piedmont Region 3-0-3.
Prerequisite: Senior standing. Mr. Gilman
Special attention is given to industrial relations in the Southeast, and its study will serve as an introduction to a method of regional industrial relations analysis.
Text: To be selected.

I.M. 460, 461, 462. Hospital Management 3-0-3.
Prerequisites: Senior standing, I.M.; P.H. 201, 202, 307. Mr. Bollinger
This is an applied course in hospital management. During the first

quarter such subjects as present need for hospitals; promoting and building a new hospital; organizing and equipping and staffing a hospital are stressed, and in addition a survey is made of the admitting clinical, and medical departments.

During the second quarter other departments such as diagnostic, therapeutic, nursing, dietary, out patient, social service, and records department will be covered.

During the third quarter a study will be made of such problems as hospital library, business department, service department, management of personnel, ethics, education of the public, hospitalization of special cases, and the overall control of the hospital as a unit.

Text: Malcolm T. MacEachern, *Hospital Organization and Management.*

I.M. 471. Special Problems in Personnel Management 2-0-2.

Prerequisite: Senior standing. Mr. Marshall

This course will be conducted on a panel discussion basis with several sessions devoted to actual personnel problems and policies as presented by representative personnel directors in the Atlanta area. Both oral and written reports on actual personnel case problems will be required.

Text: To be selected.

I.M. 480. Economics of National Defense 3-0-3.

Prerequisite: Senior standing. Staff

A study of the economic causes of war, resources, governmental procurement and commandeering, methods of finance, price controls, rationing and priorities, and demobilization.

Text: To be selected.

I.M. 482. Governmental Procurement 2-0-2.

Prerequisite: Senior standing. Staff

The organization, regulations and procedural techniques for contracting for equipment and supplies for the Armed forces will be studied. The problem will be approached from the standpoints of both the government as purchaser in the industrial markets and of industry as the seller of materials.

Text: To be selected.

I.M. 484. Price Stabilization 1-0-1.

Prerequisite: Senior standing. Mr. Sweeney

A brief analysis of the practices and problems of governmental price and production controls as realized through such factors as subsidies, taxation and limitations of credits.

Text: To be selected.

I.M. 486. National Income and Fiscal Policy 3-0-3.

Prerequisite: Senior standing. Mr. Sweeney

This course will investigate the national income accounting methods of

governmental and private agencies. The fiscal policy mechanics of the nation's banking system will be studied in order to understand the possible uses of the banking structure in fiscal policy decisions. The history of national fiscal policy economics will be reviewed and contemporary economic theories evaluated with reference to their application to national fiscal policy decision making.

Text: To be selected.

I.M. 488. Economics of Industrial Competition 3-0-3.

Prerequisite: Senior standing. Mr. Buckingham, Mr. Sweeney

An investigation of production economics will be undertaken as preliminary to the study of the competitive and monopolistic characteristics of the contemporary industrial structure. A review of the anti-trust laws and cases will be followed by a study of the present day pricing systems of industry. The design of the course is such that it will lead towards the basis for a definition of what is "Workable Competition" relative to our present industrial structure.

Text: To be selected.

I.M. 489. Business Torts 3-0-3.

Prerequisite: Senior Standing. Mr. Dennison, Mr. Proctor

One of the most important phases of management is that of the legal risks involved in the conduct of the affairs of an industry. The purpose of this course is to give the student an opportunity to study these risks and the legal liabilities accruing from various types of breaches of legal duty. Such subjects as negligence, assault and battery, libel and slander, unfair trade practices, acts in violation of health and food laws, and laws of such general statutes as anti-trust laws will be studied in detail.

Text: To be selected.

I.M. 490. Contemporary Economic Theory 3-0-3.

Prerequisite: Ec. 203 or equivalent.

Mr. Buckingham, Mr. Dallas, Mr. Sweeney

This course is designed as a second, or advanced, course in economics. An analysis and evaluation will be made of the various current theoretical proposals for solving the economic problems of production, distribution, employment and income.

Text: To be selected.

I.M. 494. Economic Control of Industry 3-0-3.

Prerequisite: Senior Standing.

Mr. Buckingham, Mr. Dallas, Mr. Sweeney

This course will consider, first, the bases for governmental regulation of industry as provided by economic theory. An analysis and evaluation of existing and proposed industrial controls will then be made. The purpose of this course will be the determination of the proper role of government economic controls in modern industrial society.

Text: To be selected.

GRADUATE COURSES OFFERED

I.M.	605	Comparative Economic Systems	4-0-4
I.M.	607	Industrial Marketing Practice	3-0-3
I.M.	621	Statistics for City Planners	3-0-3
I.M.	625	Economics of Production	4-0-4
I.M.	626	Development of Economic Thought	3-0-3
I.M.	627	Social Security and Industrial Pensions	3-0-3
I.M.	631	Accounting Control	4-0-4
I.M.	633	Advanced Personnel Management	3-0-3
I.M.	634	Advanced Personnel Management	2-3-3
I.M.	637	Law of Contracts	4-0-4
I.M.	638	The Law of the Market	4-0-4
I.M.	639	Corporation Law	4-0-4
I.M.	640	Problems in Industrial Marketing	3-0-3
I.M.	642	Sales Analysis and Management	3-0-3
I.M.	644-5	Business Cycles	4-0-4
I.M.	646	Investment Analysis	3-0-3
I.M.	652-3	Industry and Government	3-0-3
I.M.	661	Public Relations	3-0-3
I.M.	662	Regional Analysis of Industrial Relations	3-0-3
I.M.	663	Advanced Industrial Accounting	3-3-4
I.M.	664	Advanced Industrial Accounting	3-3-4
I.M.	667	Advanced Labor Problems	3-0-3
I.M.	668	Advanced Labor Problems	3-0-3
I.M.	700	Master's Thesis	
I.M.	701-2-3	Seminar	1-0-0
I.M.	704	Special Management Problems	Credit to be arranged
I.M.	741	Market Research and Analysis	3-6-5
I.M.	753	Organizing and Managing an Industrial Enterprise	2-6-4
I.M.	754	Advanced Industrial Management Problems	3-3-4
I.M.	756	Advanced Economic Analysis	3-0-3
I.M.	757	Advanced Economic Analysis	3-0-3
I.M.	761	Economic Theories of Wages	3-0-3

(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)

SCHOOL OF MATHEMATICS

Acting Director—Herman K. Fulmer; *Professors*—Alson H. Bailey, Irwin E. Perlin, Walter Reynolds, David M. Smith*; *Associate Professors*—John C. Currie, W. Buell Evans, James R. Garrett, Chandler H. Holton, Marvin B. Sledd, Austin L. Starrett, James H. Wahab, Ralph A. Willoughby; *Assistant Professors*—James C. Brooks, Bertram M. Drucker, Martinus H. M. Esser, Arthur E. Fulton, Robert H. Kasriel, William A. Martin, John A. Nohel, Gordon K. Overholtzer, William M. Perel, Colbert T. Purvis, Henry Sharp, Jr., C. Robert Swenson, John R. Vail, Guy A. York; *Instructors*—Walter R. Carnes, Robert L. Herring; *Secretary*—Loretta Alexander.

General Information

The School of Mathematics has two functions: (1) to train students in basic mathematics and in its use as an effective tool in engineering and the natural sciences; (2) to furnish a sound and adequate foundation for more advanced study in applied mathematics and applied science.

In addition to its regular undergraduate service courses, the School of Mathematics offers programs of study leading to the degrees of

Bachelor of Science in Applied Mathematics
and
Master of Science in Applied Mathematics.

It also offers a varied selection of advanced undergraduate and graduate courses which may be used as electives by students in the schools of engineering and the natural sciences. The requirements for the B.S. in Applied Mathematics are listed on the following pages; the requirements for the M.S. in Applied Mathematics may be found in the Graduate Bulletin.

Entering freshmen who do exceptionally well on the placement tests in algebra and trigonometry may, if they wish, receive advanced standing credit in Math. 101 and 102 and start in Math. 103.

*Emeritus

FRESHMAN YEAR

NOTE: Under Quarters 3-3-4 mean 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2	Engineering Drawing	0-6-2	0-6-2	....
Draw.	109	Applied Descriptive Geometry	....	....	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytic Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	ROTC	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Either M.L. 101-2-3 (German), M.L. 107-8-9 (French), M.L. 119-20-21 (Russian), or S.S. 105-6-7 are acceptable.

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	201-2-3	Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Mech., Elec., Heat, Sound, Light	5-3-6	5-3-6	5-3-6
Math.	309	Introd. to Higher Algebra	....	....	3-0-3
M.E.	201	Machine Lab.	0-3-1	....	....
C.E.	204	Elementary Surveying	....	1-3-2	....
ROTC	201-2-3	Military	3-1-2	3-1-2	3-1-2
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
		Credit hours	16-11-18	17-11-19	19-8-20

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	315	Public Speaking	....	....	3-0-3
Math.	305-6	Differential Equations	3-0-3	3-0-3	....
Math.	401-2-3	Introduction to Analysis	3-0-3	3-0-3	3-0-3
Phys.	307-8	Mech., Elec.	3-0-3	3-0-3	....
Phys.	313	Nuclear Physics	....	....	5-0-5
		Approved electives (Note 1)	0-0-9	0-0-9	0-0-9
		Credit hours	9-0-18	9-0-18	11-0-20

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	321	Technical English	3-0-3	....	....
Math.		(Any six Math. courses at the 400 level or higher)	6-0-6	6-0-6	6-0-6
Phys.	320	Mechanics	....	5-0-5	....
		Approved electives (Note 1)	0-0-9	0-0-9	0-0-12
		Credit hours	9-0-18	11-0-20	6-0-18

NOTE 1: Of the 57 hours of approved electives in the junior and senior years, at least 27 must be chosen from courses in mathematics, chemistry, engineering, mechanics, and physics. Of these 27 hours, those in chemistry, engineering, mechanics, and physics must be at the 300 level or higher.

COURSES FOR UNDERGRADUATES

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Math. 3. Entrance Algebra 5-0-0.
Prerequisite: None. Staff
A non-credit course for students not prepared to take Math. 101.
Text: To be selected.

Math. 101. College Algebra 5-0-5.
Prerequisite: Entrance Algebra. Staff
A review of exponents, simplifications and quadratics, followed by the binominal theorem, complex numbers and elementary theory of equations.
Text: Fulmer and Reynolds, *College Algebra.*

Math. 102 Trigonometry 5-0-5.

Prerequisite: Math. 101. Staff

A standard college course in plane trigonometry. Instruction in slide rule is given in this course.

Text: To be selected.

Math. 103. Plane Analytic Geometry 5-0-5.

Prerequisite: Math. 102. Staff

Analytic geometry of point, line and circle; elementary conic sections; polar coordinates; transcendental curves useful in engineering.

Text: To be selected.

Math. 201. Calculus I 5-0-5.

Prerequisite: Math. 103. Staff

A course in the fundamental principles of the calculus, including the differentiation and integration of polynomials with applications to rectilinear motion, problems in maxima and minima, approximations by differentials, areas, volumes.

Text: Smail, *Calculus.*

Math. 202. Calculus II 5-0-5.

Prerequisite: Math. 201. Staff

A continuation of Calculus I. This course completes discussion of differentiation with application to rates, velocity and acceleration, curvature, Newton's method. It also covers formulas and methods of integration.

Text: Smail, *Calculus.*

Math. 203. Calculus III 5-0-5.

Prerequisite: Math. 202 Staff

A continuation of Calculus II. This course reviews integration and applications. It also includes Simpson's rule, indeterminate forms, series, partial derivatives, multiple integrals.

Text: Smail, *Calculus.*

Math. 205. Elementary Statistical Analysis 3-0-3.

Prerequisite: Math. 201 or consent of instructor. Staff

An introduction to mathematical statistics including probability, confidence limits, and tests of significance and randomness.

Text: To be selected.

Math. 206. Elementary Statistical Analysis 3-0-3.

Prerequisite: Math. 205. Staff

A continuation of Math. 205, correlation, least squares, design of experiments, and the theory of testing statistical hypotheses.

Text: To be selected.

Math. 210 Mathematics of Finance 3-0-3.

Prerequisite: Freshman Mathematics. Staff

Short methods of computation; interest and discount; annuities; amortization, depreciation; valuation and yield of bonds.

Text: Simpson, Pirenian and Crenshaw, *Mathematics of Finance,* Part II.

Math. 305. Differential Equations 3-0-3.

Prerequisite: Math. 203. Staff

A course centered around the linear equation. Many applications are given in physics, chemistry, and mechanics.

Text: Nelson, Folley, Coral—*Differential Equations.*

Math. 306. Differential Equations 3-0-3.

Prerequisite: Math. 305. Staff

Various special types of differential equations. Methods of approximate solution, solution in series.

Text: Nelson, Folley, Coral—*Differential Equations.*

Math. 309. Introduction to Higher Algebra 3-0-3.

Prerequisite: Math. 202. Staff

Exact and approximate solutions of higher degree equations. DeMoivre's theorem and roots of unity. Systems of linear equations, determinants, elimination theory. Introduction to matrix theory with applications to simple translations and rotations. Solutions of indeterminate equations of first degree.

FOR GRADUATES AND ADVANCED UNDERGRADUATES

Math. 400. Special Topics 3-0-3.

Staff

For example Math. 400(a) could be Introduction to Matrices and Determinants.

The purpose here is to enable the School of Mathematics to comply with requests from the Engineering Schools for courses in selected topics. Given on demand.

Text: To be selected.

Math. 401. Introduction to Analysis 3-0-3.

Prerequisite: Math. 305 or concurrently Staff

The first of a sequence of three courses intended to provide the grasp of fundamental concepts necessary for profitable study of mathematics and its applications at the first-year graduate level. Sequence, limit, continuity, continuous functions, definite integral, derivative, mean-value theorem, indefinite integral, fundamental theorem of the calculus, estimation of integrals, order of magnitude of functions, non-integrable functions, improper integrals.

Text: Courant, *Differential and Integral Calculus, Vol. I.*

Math. 402. Introduction to Analysis 3-0-3.
Prerequisite: Math. 401. Staff
A continuation of Math. 401. Taylor's theorem, approximation of functions by polynomials, infinite series, functions of several variables, integrals as functions of a parameter.
Text: Courant, *Differential and Integral Calculus, Vol. I and II.*

Math. 403. Introduction to Analysis 3-0-3.
Prerequisite: Math. 402. Staff
The third course of the sequence on fundamental concepts. Multiple integrals; integral estimates, mean-value theorem, change of order of integration, differentiation under the integral sign, transformations of integrals. Line and surface integrals; definitions, independence of path, Gauss' theorem, Stokes' theorem, Green's theorem.
Text: Courant, *Differential and Integral Calculus, Vol. I and II.*

Math. 409. Fundamental Concepts in Mathematics 3-0-3.
Prerequisite: Differential Equations or consent of instructor. Staff
A course designed for mathematics majors and beginning graduate students. Unifies and extends certain basic notions of college mathematics.
Text: To be selected.

Math. 411. Advanced Engineering Mathematics 3-0-3.
Prerequisite: Math. 306 or consent of instructor. Staff
Simultaneous linear differential equations, Fourier series, Bessel functions.
Text: Wylie, *Advanced Engineering Mathematics.*

Math. 412. Advanced Engineering Mathematics 3-0-3.
Prerequisite: Math. 306 or consent of instructor. Staff
Laplace transformation, partial differential equations of mathematical physics.
Text: Wylie, *Advanced Engineering Mathematics.*

Math. 413. Advanced Engineering Mathematics 3-0-3.
Prerequisite: Math. 306 or consent of instructor. Staff
Topics from complex function theory including conformal mapping and contour integration.
Text: Wylie, *Advanced Engineering Mathematics.*

Math. 417. Mathematical Statistics 3-0-3.
Prerequisite: Math. 203. Staff
The basic principles of modern statistical methods valuable to the engineer: frequency distributions; quality control; sampling; estimation; confidence intervals; tests of hypotheses.
Text: To be selected.

Math. 418. Probability with Applications 3-0-3.
Prerequisite: Consent of instructor.
Presents the modern theory of probability with applications to physical situations. The terminology and notation used in the course will be consistent with that used in present-day engineering journals.
Text: To be selected.

Math. 420. Vector Analysis 3-0-3.

Prerequisite: Math. 306 or consent of instructor. Staff

Vector algebra and applications to force diagrams; vector calculus, divergence, curl, and their role in potential theory. Line integrals, Gauss' theorem, Stokes' theorem, Green's theorem.

Text: Phillips, *Vector Analysis.*

Math. 422. Graphical Methods 3-0-3.

Prerequisite: Math. 203. Staff

Empirical equations, alignment charts, graphical differentiation and integration.

Text: To be selected.

Math. 423. Numerical Analysis I 3-0-3

Prerequisite: Math. 203. Staff

Finite differences; interpolation; numerical differentiation and integration; least squares, Fourier anaylsis.

Text: To be selected.

Math. 424. Numerical Analysis II 3-0-3.

Prerequisite: Math. 306; Math. 423 or consent of the instructor. Staff

Numerical solutions of systems of algebraic and transcendental equations; numerical approximation of solutions of ordinary differential equations.

Text: To be selected.

Math. 425. Principles of Digital Computers 3-0-3.

Prequisite: Math. 203. Staff

Organization and characteristics of digital computers, number systems; Boolean algebra; programming and coding of elementary problems.

Text: To be selected.

GRADUATE COURSES OFFERED

Math.	600	Special Topics
Math.	601-2-3	Methods of Applied Mathematics
Math.	611	Introduction to Partial Differential Equations
Math.	614	Laplace Transforms
Math.	617	Matrix Analysis
Math.	623	Advanced Numerical Analysis
Math.	625-26	Advanced Programming and Coding
Math.	631-2-3	Functions of a Real Variable
Math.	634-5-6	Functions of a Complex Variable
Math.	700	Master's Thesis
Math.	701-2-3	Methods of Mathematical Physics
Math.	707	Special Topics

Requirements for M.S. Degree in Applied Mathematics
(Consult Graduate Bulletin)

SCHOOL OF MECHANICAL ENGINEERING

(Established in 1888)

Director—Homer S. Weber; *Professors*—Robert L. Allen, Mario J. Goglia, Archibald D. Holland, Joseph P. Vidosic; *Associate Professors*—Horace O. Foster, Ottis M. Harrelson, William B. Harrison, III, William A. Hinton, Joe L. Morris, Richard A. Trotter, Hayden Zimmerman; *Assistant Professors*—*Kenneth G. Picha, Frank A. Thomas, Jr., A. O. White, Jr. (Part-time); *Instructors*—J. W. Keck, Jr. (Part-time), R. P. Ramirez; *Part-time Lecturers*—S. C. Barnett, A. L. Holliman, J. H. Murphy; *Assistants in Shops*—George Z. Bonner, John W. Davis, J. L. Dorris, J. G. Doyal, M. C. Ingram; *Graduate Teaching Assistants*—B. F. Bobo, E. W. Farr, J. R. Fowler, T. B. Lane, Alvin Lowi, Jr., H. E. Wingo; *Laboratory Personnel*—Clifford Bannister, H. H. Phillips, Thomas D. Sangster, Mrs. Mary E. Robinson; *Secretary*—Mrs. Mary Ellen Chapman.

General

Mechanical Engineering embraces the science and art of the generation, transmission, and utilization of heat and mechanical energy and the design as well as the production of tools and machines and their products. Research, design, production, operation, administration, and economics are functional aspects of this branch of professional engineering.

The course of study is not designed to cover the entire field of technical thought and achievement in Mechanical Engineering but to impress basic principles upon the student and to assist him to assimilate new ideas and to draw correct conclusions from given facts.

Emphasis, in the freshman and sophomore years, is placed on mathematics, chemistry, and physics and, in the junior and senior years, on the strength and the metallurgy of materials, applied mechanics, thermodynamics, and fluid mechanics and the application of those fundamental subjects to the diverse problems of mechanical engineering.

Satisfactory completion of the curriculum leads to the degree Bachelor of Mechanical Engineering.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-9	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

*On leave

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
C.E.	205	Elementary Surveying	0-3-1	....	....
Draw.	203	Applied Descriptive Geometry	0-3-1	....	....
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
M.E.	201-10	Machine Laboratory	0-3-1	0-6-2	....
M.E.	205	Welding Laboratory	....	....	0-3-1
M.E.	206	Pattern and Foundry Laboratory	....	0-3-1	....
Mech.	301	Applied Mechanics	....	....	2-0-2
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
**ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Totals	16-17-20	16-17-20	18-11-20

**If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
E.E.	320-1	Applied Electricity	3-3-4	4-3-5	....
E.E.	322	Industrial Electronic Control	....	....	3-3-4
Math.	305	Differential Equations	3-0-3	....	....
M.E.	308	Metallurgy and Heat Treating	....	3-3-4	....
M.E.	322-3-5	Thermodynamics	3-0-3	3-0-3	5-0-5
M.E.	350	Instruments Laboratory	0-3-1	....	....
M.E.	351	Fuels Laboratory	....	0-3-1	....
M.E.	352	Power Plant Aux. Laboratory	....	....	0-3-1
M.E.	434	Fluid Mechanics	....	....	5-0-5
Mech.	302-3	Applied Mechanics	2-0-2	3-0-3	....
Mech.	304	Applied Mechanics	0-3-1	....	....
Mech.	331-2-3	Mechanics of Materials	3-0-3	2-0-2	3-0-3
Electives*			3-0-3	3-0-3	3-0-3
		Totals	17-9-20	18-9-21	19-6-21

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	315	Public Speaking	....	3-0-3	....
Eng.	321	Technical English	3-0-3	....	....
M.E.	430	Heat, Vent., and Air Cond.	....	3-0-3	....
M.E.	433	Power Plant Design	....	....	3-0-3
M.E.	435	Heat Transfer	3-0-3	....	....
M.E.	442	Internal Combustion Engines	3-0-3	....	....
M.E.	451-2-0	Heat Power Laboratory	0-3-1	0-3-1	0-3-1
M.E.	467-8-479	Machine Design	3-3-4	4-3-5	3-6-5
M.E.	491-2-3	Seminar	1-0-1	1-0-1	1-0-1
Group Electives		See outline	3-0-3	3-0-3	3-0-3
Electives*			3-0-3	3-0-3	3-0-3
		Totals	19-6-21	17-6-19	13-9-16

*If Advanced Air or Military is the elective, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

Group Electives

Three Group Elective Courses, nine quarter hours total credit, designed to cover some special phase of the mechanical engineering field, are required in the senior year of the Mechanical Engineering curriculum as follows:

Group 1 Electives

This group is designed for those students having an interest in machine design.

1st Quarter—Mech. 421—Mechanical Vibrations	3-0-3
2nd Quarter—M.E. 480—Dynamics of Machinery	2-3-3
3rd Quarter—M.E. 401—Inspection and Gaging	2-3-3

Group 2 Electives

This group provides for those students interested in the heating, ventilating, air conditioning, and refrigeration field.

1st Quarter—M.E. 431—Refrigeration	3-0-3
2nd Quarter—M.E. 445—Principles of Automatic Control	3-0-3
3rd Quarter—M.E. 443—Heat, Vent., and Air Cond. Design	3-0-3

Group 3 Electives

This group provides for those students interested in the steam and gas power field.

1st Quarter—*M.E. 432—Steam Turbines	3-0-3
2nd Quarter—*M.E. 437—Diesel Engines	2-3-3
3rd Quarter—*M.E. 439—Gas Turbines	3-0-3

*M.E. 447—Elements of Nuclear Power—3-0-3 may be substituted.

Group 4 Electives

This group provides for those students desiring the basic Mechanical Engineering degree but who, due to some special interest, would like a sequence of courses in some other field of engineering or science. The student must submit a letter to the School of Mechanical Engineering, when preregistering for his first quarter senior year, outlining his program and listing three electives which he wishes to take. These courses should lead to some goal, selected by the student, and must be approved by the departmental schedule advisor, subject to final approval by the Director of the School of Mechanical Engineering.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

M.E. 201. Machine Laboratory 0-3-1.

Prerequisite: Math 103. Mr. Morris and Staff

A combined lecture, demonstration, and laboratory course covering the fundamentals of machine tool work. The practical work consists of a project selected for its training value.

Text: Doyle, *Metal Machining.*

M.E. 202. Machine Laboratory 0-3-1.

Prerequisite: M.E. 201. Mr. Morris and Staff

A combined lecture, demonstration, and laboratory course, stressing machineability of materials, machine tool time, and production economy. The practical work is a continuation of M.E. 201, with another project.

Text: Doyle, *Metal Machining.*

M.E. 205. Welding Laboratory 0-3-1.

Prerequisite: Math. 103 and Chem. 103. Mr. Harrelson and Staff

A brief survey of metallurgical theory, classification of metals, and the practical application of all methods of pressure and non-pressure welding of ferrous and non-ferrous metals.

Text: Lincoln Electric Co., *Procedure Handbook of Arc Welding Design and Practice.*

M.E. 206. Pattern and Foundry Laboratory 0-3-1.

Prerequisite: Sophomore Standing. Not open to students with credit for M.E. 203 or 204. Mr. Foster and Staff

Instruction is given in pattern making and foundry practice. The properties and uses of ferrous and non-ferrous castings are studied.

Text: Benedict, *Manual of Foundry and Pattern Shop Practice.*

M.E. 210. Machine Laboratory 0-6-2.

Prerequisite: M.E. 201. Not open to students with credit for M.E. 202 or 301. Mr. Morris and Staff

A combined lecture, demonstration, and laboratory course, stressing machineability of materials, machine tool time, production economy, semi-automatic tool methods, the use of abrasives, and the calculations necessary for the production of gears. The practical work consists of projects correlating with the theory.

Text: Doyle, *Metal Machining.*

M.E. 267. Kinematics of Mechanisms 3-0-3.

Prerequisites: Draw. 103 or 109, Phys. 213. Staff

A study of mechanisms. Cams, gears, belts, velocities, accelerations, and relative motion are included.

Text: Keown and Faires, *Mechanism.*

M.E. 308. Metallurgy and Heat Treating 3-3-4.

Prerequisites: Chem. 103, and Phys. 207. Mr. Harrelson and Staff

Metallurgical theory, metallography, and heat treating, with practical applications to ferrous and non-ferrous metals.

Text: Teichert, *Metallography and Heat Treatment of Steel.*

M.E. 320. Thermodynamics 4-0-4.
Prerequisites: Phys. 209 or parallel, Math. 203 or parallel.
Mr. Goglia and Staff
The fundamentals of engineering thermodynamics. The properties of fluids, energy equations, and practical applications are included.
Texts: Sweigert and Goglia, *Thermodynamics;* Keenan-Keyes, *Thermodynamic Properties of Steam.*

M.E. 322. Thermodynamics 3-0-3.
Prerequisites: Phys. 209 or parallel; Math. 203 or parallel.
Mr. Goglia and Staff
A study of the fundamental laws of engineering thermodynamics and the properties of systems.
Texts: Sweigert and Goglia, *Thermodynamics;* Keenan-Keyes, *Thermodynamic Properties of Steam.*

M.E. 323. Thermodynamics 3-0-3.
Prerequisite: M.E. 322. Mr. Goglia and Staff
The development of fundamentals is continued and attention is given to processes involving vapors, internal combustion engine cycles, air compression, flow of gases, gas mixtures, and variable specific heats.
Text: Sweigert and Goglia, *Thermodynamics;* Keenan-Keyes, *Thermodynamic Properties of Steam.*

M.E. 325. Thermodynamics 5-0-5.
Prerequisite: M.E. 323. Mr. Goglia and Staff
The study of combustion calculations, vapor cycles, steam engines, steam flow in nozzles, steam turbines, refrigeration, and psychrometrics.
Text: Sweigert and Goglia, *Thermodynamics;* Keenan-Keyes, *Thermodynamic Properties of Steam.*

M.E. 329. Mechanical Equipment of Buildings 2-0-2.
Prerequisite: Phys. 209 or 203. Staff
Principles of water supply, and plumbing and heating, with the application of these principles to problems encountered in buildings are studied.
Text: Gay and Fawcett, *Mechanical and Electrical Equipment of Buildings.*

M.E. 330. Air Conditioning and Refrigeration 2-0-2.
Prerequisite: M.E. 329. Staff
Principles and equipment used in the heating, ventilating, and air conditioning of buildings are studied.
Text: Gay and Fawcett, *Mechanical and Electrical Equipment of Buildings.*

M.E. 331. Design of Mechanical Equipment for Buildings 1-3-2.
Prerequisites: M.E. 329, 330. Mr. Hinton
The principles studied in M.E. 329 and 330 are applied to design of plumbing, heating, and air conditioning systems for buildings.
Text: Gay and Fawcett, *Mechanical and Electrical Equipment of Buildings.*

M.E. 332. Elementary Heat Power Engineering 3-0-3.
Prerequisite: M.E. 320 or Ch.E. 420. Staff
A study of fuels and combustion, steam boilers, furnaces, stokers, superheaters, coal and ash handling machinery, mechanical draft, steam engines, internal combustion engines, and steam turbines.
Texts: Butterfield, Jennings and Luce, *Steam and Gas Engineering;* Keenan-Keyes, *Thermodynamic Properties of Steam.*

M.E. 340. Elements of Heat Power 4-3-5.
Prerequisites: Physics 209, Math. 203 or parallel. Not open to students with credit for M.E. 320, 332, or 354. Staff
A study of basic thermodynamics, fuels and their combustion, refrigeration, internal combustion engines, steam generation, steam power, and air compressors. The laboratory work consists of short experiments on equipment used in the heat-power field.
Text: F. T. Morse, *Elements of Applied Energy.*

M.E. 350. Instruments Laboratory 0-3-1.
Prerequisites: M.E. 320 or 322 or parallel. Staff
Principles of measurement and accuracy of instruments are discussed.
Instrumentation employed includes: planimeters, pressure and temperature measuring devices, speed, torque and power elements.
Text: Sweeney, *Measurement Techniques in Mechanical Engineering; ASME Code on General Instructions—Power Test Codes.*

M.E. 351. Fuels Laboratory 0-3-1.
Prerequisite: M.E. 320 or 322. Staff
The analysis of solid fuels; heating value of solid, liquid, and gaseous fuels, distillation tests and vapor pressure determination for volatile fuels; exhaust gas analysis; and, the determination of physical properties of oils.
Text: *None.*

M.E. 352. Power Plant Auxiliaries Laboratory 0-3-1.
Prerequisites: M.E. 350 and 325 or concurrently. Staff
Tests of auxiliary equipment consisting of centrifugal pumps, vacuum heating pumps, liquid meters, air meters, and friction in pipes.
Text: *None.*

M.E. 353. Materials Laboratory 0-3-1.
Prerequisite: Mech. 332 or 336, or parallel. Staff
The testing of materials in compression, bending, shear, tension, and torsion and hardness tests.
Text: Timoshenko and MacCullough, *Elements of Strength of Materials.*

M.E. 354. Heat Power Laboratory 0-3-1.
Prerequisites: M.E. 332 and M.E. 320 or Ch.E. 420. Staff
Five experiments selected from: air compressor, internal combustion engines, refrigeration, gas fired boiler with turbine, steam calorimeter, steam engine, centrifugal pump, venturi meter, and steam generating unit.
Text: *None.*

M.E. 367. Machine Design 4-3-5.

Prerequisites: Mech. 302 and 332. Mr. Vidosic and Staff

Kinematics, stress analysis methods, machine elements, and fundamental machine design principles are studied.

Texts: Guillet and Church, *Kinematics of Machines;* Black, *Machine Design.*

M.E. 401. Inspection and Gaging 2-3-3.

Prerequisite: Senior standing in I.E. or M.E., or the consent of the instructor. Mr. Morris

Inspection methods, quality control, interchangeability, and precision measuring instruments, as used in the manufacture of gaging tools for industrial inspection.

Text: Michelon, *Industrial Inspection Methods.*

M.E. 402. Jigs and Fixtures 2-3-3.

Prerequisite: Senior standing in I.E. or M.E., or the consent of the instructor. Mr. Morris

Class, design, and practical work in making jigs and fixtures and solving tooling problems pertaining to mass production.

Text: Notes and Work Sheets of the Instructor.

M.E. 430. Heating, Ventilation and Air Conditioning 3-0-3.

Prerequisite: M.E. 325. Mr. Hinton and Mr. Holland

The theory of heating, ventilating, and air conditioning. Problems of a practical nature apply the theory to different types of buildings and conditions.

Text: Carrier, Cherne, and Grant, *Modern Air Conditioning, Heating and Ventilating.*

M.E. 431. Refrigeration 3-0-3.

Prerequisite: M.E. 325. Mr. Holland

A study of the compressor, condenser, piping and accessories of the refrigeration plant, and other practical application of the principles of refrigeration.

Text: Jordan and Priester, *Refrigeration.*

M.E. 432. Steam Turbines 3-0-3.

Prerequisite: M.E. 325. Mr. Holland

A detailed study of the design and operation of steam turbines.

Text: Church, *Steam Turbines.*

M.E. 433. Power Plant Design 3-0-3.

Prerequisites: M.E. 325, M.E. 435 or concurrently. Mr. Holland

Pumps, piping, fans, fuels, steam generators, boiler auxiliaries, heat exchangers, steam prime movers, and the economics of steam power plants are studied. Equipment selection for a particular application is stressed.

Text: Gaffert, *Steam Power Stations.*

M.E. 434. Fluid Mechanics 5-0-5.
Prerequisites: M.E. 323 and Mech. 303.
Mr. Allen, Mr. Goglia, and Mr. Hinton
The study of statics and dynamics of fluids, flow of viscous fluids through pipes, orifices, etc., and dynamic similarity. The course includes compressible as well as incompressible fluids. Use is made of dimensional analysis and thermodynamics.
Text: Hunsaker and Rightmire, *Engineering Applications of Fluid Mechanics.*

M.E. 435. Heat Transfer 3-0-3.
Prerequisite: M.E. 325. Mr. Goglia, Mr. Harrison, and Mr. Hinton
The fundamentals of conduction, convection, and radiation of heat, with special emphasis on their practical application.
Text: McAdams, *Heat Transmission.*

M.E. 437. Diesel Engines 2-3-3.
Prerequisite: M.E. 442 or 446. Mr. Allen
A study of the theory of Diesel engines, maintenance and design of engines, fuel injection, lubrication systems, fuels and combustion, combustion chambers, and testing of the engine in the laboratory.
Text: Adams, *Elements of Diesel Engineering.*

M.E. 439. Gas Turbines 3-0-3.
Prerequisites: M.E. 325 and 434. Not open to students with credit for M.E. 446. Mr. Allen
The theory and the design of gas turbines and jet engines and the various applications of these engines.
Text: Vincent, *Theory and Design of Gas Turbines and Jet Engines.*

M.E. 442. Internal Combustion Engines 3-0-3.
Prerequisites: M. E. 325, Mech. 303. Mr. Allen and Staff
The mechanical construction, engine cycles, ignition, fuels, fuel feeds, combustion, vibration and balancing, and performance of internal combustion engines, with reference to aeronautical, automotive, and industrial use.
Text: Obert, *Internal Combustion Engines.*

M.E. 443. Heating, Ventilation, and Air Conditioning Design 3-0-3.
Prerequisite: M.E. 430. Mr. Hinton
A continuation of M.E. 430. The subject matter emphasizes the design of various systems, including automatic controls, and the selection of equipment.
Text: Carrier, Cherne, and Grant, *Modern Air Conditioning, Heating and Ventilating.*

M.E. 445. Principles of Automatic Control 3-0-3.
Prerequisite: M.E. 325. Mr. Goglia
The theory of automatic control with application to combustion, temperature, pressure, humidity, flow, speed, power and position control. Industrial control systems are considered.
Text: LaJoy, *Industrial Automatic Controls.*

M.E. 446. Aircraft Propulsion Engines 3-0-3.

Prerequisites: M.E. 323, and Mech. 303. Not open to students with credit for M.E. 442. Mr. Allen

A study of various types of aircraft propulsion engines, including the thermodynamic cycles, performance characteristics, and applications of the engines.

Text: Liston, *Power Plants for Aircraft.*

M.E. 447. Elements of Nuclear Power 3-0-3.

Prerequisite: M.E. 435, or equivalent. Mr. Harrison

A study of characteristics of nuclear power systems. Nuclear physics and nuclear reactions will be used for establishing some reactor principles and reactor types.

Text: Murray, *Introduction to Nuclear Engineering.*

M.E. 450. Heat Power Laboratory 0-3-1.

Prerequisites: M.E. 325 and M.E. 352. Should be scheduled concurrently with M.E. 433. Staff

Tests of multi-stage turbines, air compressors, gas fired boiler with turbine, feed water control.

Text: *None.*

M.E. 451. Heat Power Laboratory 0-3-1.

Prerequisites: M.E. 325 and M.E. 352. Should be scheduled concurrently with M. E. 442. Staff

Economy, power, and heat balance tests of Diesel and Otto cycle engines, with comparisons of the two cycles. The effect of varying the air fuel ratio and spark setting on the Otto engine is studied. Motor analysis is included.

Text: *None.*

M.E. 452. Heat Power Laboratory 0-3-1

Prerequisites: M.E. 325 and M.E. 352. Should be scheduled concurrently with M.E. 430. Staff

Tests on refrigeration machinery, air conditioning equipment, centrifugal fans, and unit heaters. Heat transfer studies are made, and the efficiencies of pipe insulating materials are determined.

Text: *None.*

M.E. 467. Machine Design 3-3-4.

Prerequisites: Mech. 303, 332. Mr. Vidosic and Staff

A study of the mechanics of machinery. Motion, velocity, acceleration, and inertia forces are included.

Texts: Ham and Crane, *Mechanics of Machinery;* Marks (or equivalent), *Mechanical Engineer's Handbook;* Hall and Azpell, *Mechanism Problems.*

M.E. 468. Machine Design 4-3-5.

Prerequisites: M.E. 467 and Mech. 333. Mr. Vidosic and Staff

Stress and yield analysis of mechanical components. The course applies fundamental principles to the synthesis of machines.

Text: Spotts, *Design of Machine Elements.*

M.E. 479. Machine Design 3-6-5.

Prerequisite: M.E. 468. Mr. Vidosic and Staff

The design and performance of some important machine elements are studied. The application of fundamental principles to the design of machines is extended.

Text: Spotts, *Design of Machine Elements.*

M.E. 480. Dynamics of Machinery 2-3-3.

Prerequisite: M.E. 467. Mr. Vidosic and Mr. Weber

Static and dynamic forces in machines are studied and analyzed. Machine balancing and governors are investigated.

Texts: Leutweiler, *Problems in Mechanics of Machinery.* And to be selected.

M.E. 491-2-3. Seminar 1-0-1.

Prerequisite: Senior standing in Mechanical Engineering. Staff

These courses give the student an opportunity to hear talks by prominent engineers and, also, to present and discuss papers on technical subjects.

M.E. 494-5-6. Special Problems in Mechanical Engineering 0-9-3

Prerequisite: Senior standing in Mechanical Engineering. Staff

These courses are for the student who is fitted for original or research work.

GRADUATE COURSES OFFERED

M.E.	622-3-4	Thermodynamics	3-0-3
M.E.	630	Heating, Ventilating, and Air Conditioning	3-0-3
M.E.	631	Advanced Refrigeration	3-0-3
M.E.	635	Heat Transfer	3-0-3
M.E.	636	Internal Combustion, Engine Design	3-0-3
M.E.	637	Diesel Engines	3-0-3
M.E.	639	Turbines	3-0-3
M.E.	640	Combustion	3-0-3
M.E.	643-4	Fluid Flow	3-0-3
M.E.	645-6	Heat Transfer	3-0-3
M.E.	647	Fluid Flow	3-0-3
M.E.	650	Advanced Heat Laboratory	0-6-2 or 0-9-3
M.E.	658	Mechanism Synthesis	3-0-3
M.E.	659	Engineering Design	3-6-5
M.E.	661	Advanced Dynamics of Machinery	3-0-3
M.E.	662	Machine Vibration	3-0-3
M.E.	663	Elastic Yield Design of Machine Members	3-0-3
M.E.	664	Experimental Stress Analysis Applied to Machine Members	2-3-3
M.E.	669	Materials for Design	3-0-3
M.E.	683	Lubrication	3-0-3

(Complete details about these courses are contained in the **Graduate Bulletin,** a copy of which is available upon request.)

DEPARTMENT OF MILITARY SCIENCE AND TACTICS

(Established in 1917)

Commandant and Professor of Military Science and Tactics—Colonel William F. Curren, Jr.; *Assistant Professors*—Colonel Beverly M. Leigh, Colonel Ernest W. Posse, Lt. Colonel Charles A. Hall, Lt. Colonel Vitaly Kovalevsky, Major Cecil C. Baldwin, Major Elmer G. Bandy, Major Millard F. McKinsey, Major Eugene E. Monk, Captain Warren S. Anderson, Captain Corwin Boake, Jr., Captain Paul E. Chamberlain, Captain James T. Haynes, Captain Robert M. Herron, Captain Homer H. Jones, Captain Norman E. Sudnick; *Staff*—Chief Warrant Officer William E. Loomis, Master Sergeants Horace R. Absher, James L. Baccus, Dan Billings, Jacob S. Castle, William G. Dunn, Harold P. Embrey, Milford R. Franks, Russell A. Peel; Sergeants First Class Elmon V. Mangold, Jr., William C. Ross; Sergeants Cecil M. Cole, Lawrence E. Hamilton, James R. Meek, Jr.; *Secretaries*— Thelma Kitchens, Mildred Norton, and Winnie Blackstock; *Asst. Mil. Prop. Custodian*—Herbert L. Ellis, M/Sgt. USA Ret.

Reserve Officers' Training Corps

The Federal Government maintains, at the Georgia Institute of Technology, a Senior Division of the Army Reserve Officers' Training Corps, consisting of six sections; Antiaircraft Artillery, Chemical Corps, Corps of Engineers, Infantry, Ordnance Corps, and Signal Corps. General objectives of the course of instruction are to produce junior officers possessing qualities and attributes essential to their progressive and continued development in the Officers' Reserve Corps of the Army of the United States and in the Regular Army. Training in military leadership is emphasized, with instruction being given in subjects common to all branches of the Army and in tactics and techniques of the several branches.

The complete course of instruction of the Senior Division ROTC program comprises four years, with approximately 130 hours of instruction in each of the two years of the basic course, and 160 hours of instruction in each year of the advanced course with the addition of a summer camp.

Academic Credit

Academic credit toward the acquisition of a degree is granted for the completion of military courses on the basis indicated below:

	1st Q.	2nd Q.	3rd Q.	Total Credit Hrs.
Basic 1st Year	2	2	2	6
Basic 2nd Year	2	2	2	6
Advanced 1st Year	3	3	3	9
Advanced 2nd Year	3	3	3	9
Total				30

Uniforms

Students enrolling in the basic or advanced course will be furnished the ROTC uniform through Georgia Tech at an approximate cost to the student as follows:

Basic course .....$51.85 plus $2.75 service fee
Advanced course .....$87.17 plus $4.50 service fee

Prior to formal enrollment in the ROTC basic or advanced course, each student will purchase from the Treasurer's Office a credit slip for the uniform. This credit slip must be presented at ROTC headquarters for checking, after which the slip may be exchanged at the ROTC supply office for the prescribed articles of uniform and insignia.

Students formally enrolled in the ROTC are authorized a commutation in lieu of uniform which is earned in accordance with the length of time actually enrolled. The uniform allowance for advanced course students is $100.00 per student; for basic course students $50 per student. The amount paid each student will not exceed the value of the articles of uniform purchased through Georgia Tech. The account will be balanced and final settlement made by the Treasurer's office upon the student's completion of each year of the basic course, and upon completion of the two year advanced course. Any portion of the commutation in lieu of uniform not expended by the student will be returned by the institution to the Federal Government.

Texts

Textbooks are furnished by the Government.

Advance Course Subsistence Allowance

Students formally enrolled in the ROTC and pursuing the advanced course will be paid a monetary allowance at a rate equal to the value of the commuted ration. For the fiscal year 1954-55 this allowance was $0.90 per day. Commutation will not be allowed for any period in excess of two school years plus one intervening summer vacation between such years, less the period of prescribed camp training during such vacation, nor for any longer total period than 595 days. Students will not be paid subsistence allowance during the period of prescribed camp training, whether or not they attend camp at the normal time. The summer vacation for which commutation will be allowed will be that next following the school year during which the student entered upon the work of the first year of the advanced course. For each unexcused absence from an hour of instruction, an amount equivalent to two days' commutation will be deducted from the student's next payment of commutation.

The Basic Course

The basic course consists of formal instruction for four hours per week for two academic years of at least 30 weeks each. Subjects included in the first year basic course are common to all arms and services, as shown below. Subjects included in the second year basic course include specialized instruction in the various arms and services and are shown with the respective advanced courses.

Subject	1st Yr. Hrs.
Military Organization	4
Military Policy and Problems	5
Combat Formations	4
Tactics of the Rifle Squad	6
Maps and Aerial Photographs	18
First Aid and Hygiene	5
Individual Weapons and Marksmanship	22
Supply Economy	3
Leadership, Drill and Command	63
Total Hours	130

The Advanced Course

The advanced course is a recognized elective in all departments at Georgia Tech. Completion of the advanced course, including summer camp, is a prerequisite to graduation for students electing to take advanced military science, unless the student is relieved of his contractural obligations by the Army commander.

To enroll in the advanced course, a student is required (1) to have successfully completed or to have credit for the basic course and (2) to execute a contract to continue the course, including summer camp, for the two years as prescribed, provided he remains at Georgia Tech or transfers to another college having a Senior Division of the Army ROTC. Students who are members of the Naval Reserve, Marine Reserve, Coast Guard Reserve, or Air Reserve are required to terminate membership therein in order to become eligible for the advanced course.

Upon the successful completion of the advanced course and of four years' education at a college level, graduates will be tendered commissions as second lieutenants in the Officers' Reserve Corps of the Army of the United States. Students who meet other requirements promulgated by the Army will be designated Distinguished Military Students, and on graduation may be offered commissions in the Regular Army.

Members of the advanced course are required to attend camp one summer, normally between the junior and senior years. All students going to camp receive mileage for the round trip at the rate of five (5) cents per mile and are messed, housed, uniformed, and given medical and dental attention at government expense while at camp. Students will receive pay at the rate of $78 per month. The duration of the camp is six weeks beginning about 20 June each year.

The advanced course consists of military instruction for five hours per week, principally of a specialized type applicable to the arm or service concerned. Enrollment in a particular arm or service entails the prerequisite of having completed the second year basic training of that branch.

The program of instruction consists of a series of subjects which relate to the particular arm or service, and, in addition, a series of subjects common to all branches. Leadership, Drill, and Exercise of Command is included in the instruction for all three years of branch material courses. Other sub-

jects are included in the fourth year of ROTC training, and consist of the following:

Common Subjects	Fourth Year Hours
Military Administration	11
Military Law	13
Military Teaching Methods	10
Psychological Warfare	4
Geographical Foundations	4
Supply Economy	3
PMST Time	3
Total Hours	50

ANTIAIRCRAFT ARTILLERY SECTION

Any qualified student enrolled in any academic course may make application.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill, and Exercise of Command	66	45	37
Common Subjects	3	3	50
211			
Characteristics, Capabilities and Limitations of Antiaircraft Artillery Weapons	10	..	..
Service of the Piece, AW Fire Unit	10	..	..
212			
Introduction to Antiaircraft Artillery Guns	8	..	..
Characteristics, Capabilities and Limitations of 90 mm Antiaircraft Artillery Guns	8	..	..
213			
Service of the Piece, 90mm AAA Guns	10	..	..
Aerial Photograph Reading	5	..	..
Introduction to Field Artillery	10	..	..
311			
Organization	..	6	..
Communications	..	12	..
Motors and Transportation	..	6	..
Antiaircraft Artillery Tactics	..	14	..
Troop Movements	..	5	..
312			
Basic Gunnery (Medium, Heavy and Light AAA)	..	40	..
313			
Basic Gunnery (Medium, Heavy and Light AAA)	..	10	..
Map Reading	..	5	..
Field Artillery Tactics	..	19	..
411			
Antiaircraft Artillery Materiel	..	..	11
Combat Intelligence	..	..	2
Antiaircraft Artillery Tactics, Advanced	..	..	12
Command and Staff	..	..	5
412			
Antiaircraft Gunnery	..	..	12
Field Artillery Tactics and Techniques	..	..	17
Map Reading	..	..	5
New Developments	..	..	2

413			
Military Team	..	..	4
Supply and Evacuation	..	..	3
Total Hours	130	165	160

INFANTRY SECTION

Any qualified student enrolled in any academic course may make application.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill and Exercise of Command	56	36	35
Common Subjects	3	3	50
241			
Weapons	21	..	..
Technique of Fire, Rifle Squad	6	..	..
242			
Patrolling	9	..	..
243			
Military Organization	5	..	..
Tactics of Weapons Squads and Sections of Rifle and Heavy Weapons Companies	11	..	..
Maps and Aerial Photos	12	..	..
341			
Weapons	..	22	..
Field Fortifications	..	3	..
Communications	..	10	..
Estimate of the Situation and Combat Orders	..	6	..
342			
Combat Intelligence	..	4	..
Military Organization	..	6	..
Tactics of the Rifle and Heavy Weapons Platoons and Companies	..	30	..
343			
Maps and Aerial Photos	..	7	..
Gunnery	..	30	..
Summer Camp Orientation	..	3	..
441			
Military Organization	..	..	5
Tactics of Rifle and Heavy Weapons Platoons and Companies	..	..	10
Tactics of Infantry Battalion in Attack and Defense	..	..	10
Supply and Evacuation	..	..	5
Motors and Transportation	..	..	5
Troops Movements	..	..	4
442			
Command and Staff	..	..	12
The Military Team	..	..	13
Maps and Aerial Photos	..	..	8
443			
New Developments	..	..	3
Total Hours	130	165	160

CHEMICAL CORPS SECTION

Applicants for admission to the advanced course of the Chemical Corps Unit are limited to those enrolled in one of the following academic fields: chemistry, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, biology, geology, physics.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill and Command	67	50	40
Common Subjects	3	3	50
221			
Origin and Mission of the Cml C	4	..	..
CBR Agents	14	..	..
222			
Defense Against CBR Agents	11	..	..
Organization and Function of the Cml C and Cml C Units	11	..	..
223			
Cml C Material	20	..	..
321			
Protection	..	18	..
Cml Combat Intelligence	..	8	..
Decontamination	..	15	..
322			
Field Behavior of CBR Agents	..	9	..
M2 and M3 Smoke Generator Operation	..	14	..
Individual Weapons and Marksmanship	..	16	..
323			
Signal Communication	..	10	..
Employment of CBR Agents	..	12	..
Motor Vehicles	..	10	..
421			
Staff Organization and Procedure	..	..	10
Logistics, Supply and Field Services	..	..	21
422			
Operations and Training	..	..	12
Employment of Cml C Units	..	..	19
423			
Responsibilities and duties of Cml C. Officers	..	..	8
Total Hours	130	165	160

CORPS OF ENGINEER SECTION

Admission to the Corps of Engineer Unit is limited to those students who are enrolled in an academic course leading to an engineering, technical, or scientific degree. Instruction in technical subjects supplements that of the engineering school, with particular attention to the Military application of such subjects.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill and Exercise of Command	60	42	30
Common Subjects	3	3	48

231			
History and Traditions of Corps of Engrs	3	..	..
Explosives and Demolitions	8	..	..
Mine Warfare	9	..	..
232			
Camouflage	7	..	..
Organization and Tactics of Small Units	10	..	..
Organization of the Ground and Field Fortifications	10	..	..
233			
Hand Tools and Rigging	10	..	..
Characteristics of Weapons	10	..	..
331			
Military Teaching	..	18	..
Advanced Map Reading	..	12	..
Weapons and Marksmanship	..	7	..
332			
Organization of Engineer Units	..	9	..
Battalion Staff Procedures	..	11	..
Engineer Supply	..	9	..
Vehicle Operation, Maintenance and Motor Movements	..	7	..
Engineer Signal Communications	..	5	..
333			
Military Bridging	..	23	..
Tactics of Engineer Units	..	19	..
431			
Engineers in the Theater of Operations	..	..	15
River Crossing Operations	..	..	6
Engineer Reconaissance and Intelligence	..	..	8
Amphibious Operations	..	..	6
Barrier Tactics	..	..	7
432			
Construction, Utilities and Job Management	..	..	25
Roads and Airfields	..	..	15
433			
Common Subjects	..	..	(See Above)
Totals Hours	130	165	160

SIGNAL CORPS SECTION

Application for admission to the advanced Course of the Signal Corps Unit is in general limited to those students enrolled in one of the academic fields leading to a degree in engineering, electronics, or physics. However, students enrolled in courses other than these may be accepted if marked ability, aptitude, or interest in technical fields of endeavor is demonstrated.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill and Exercise of Command	67	42	30
Common Subjects	3	3	50
261			
Organization and Mission of the Signal Corps	5	..	..
Basic Wire Communications	20	..	..
262			
Basic Radio Communications	15	..	..
Communication Center Operations	10	..	..

263			
Organization and Signal Communication Practices of Infantry, Armored and Airborne Divisions	10	..	..
361			
Communication Security	..	10	..
Field Wire Communication Techniques	..	27	..
362			
Field Radio Communication Techniques	..	27	..
Message Center and Communication Center Procedures	..	14	..
363			
Signal Orders	..	8	..
Applied Signal Communication (Division)	..	14	..
Signal Supply and Repair	..	18	..
Career Guidance Program for Signal Corps Officers	..	2	..
461			
Wire Communication Materiel	..	..	23
Command and Staff	..	..	5
Combat Intelligence	..	..	4
Post Signal Operations and Administrative Procedure	..	..	2
462			
Radio Communication Materiel	..	..	23
Higher Echelon Signal Communication Systems and Equipment	..	..	16
Career Guidance Plan for Signal Corps Officers	..	..	2
463			
Signal Corps Photographic Activities and Laboratory Techniques	..	..	5
Total Hours	130	165	160

ORDNANCE SECTION

Admission to the Ordnance Unit will be limited to those students who are enrolled in an academic course of instruction leading to an engineering, technical, or other scientific degree. However, students enrolled in other courses than these may be admitted if marked ability, aptitude, or interest in technical fields of endeavor is demonstrated.

Subjects	2nd Year Hours	3rd Year Hours	4th Year Hours
Leadership, Drill and Exercise of Command	63	44	38
Common Subjects	3	3	50
251			
Artillery Materiel	10	..	..
Automotive Materiel	15	..	..
252			
Role of Ordnance	7	..	..
Fire Control Materiel	10	..	..
253			
Small Arms Materiel	10	..	..
Ammunition Materiel	12	..	..
351			
Ammunition Materiel	..	16	..
Artillery Materiel	..	10	..
Fire Control Materiel	..	12	..
352			
Small Arms Materiel	..	16	..
Automotive Materiel	..	24	..

353			
Organization of the Ordnance Corps	..	10	..
Individual Weapons and Marksmanship	..	12	..
Ammunition Supply	..	18	..
451			
Maintenance and Supply	..	..	20
Military Intelligence	..	..	2
Command and Staff	..	..	10
452			
Guided Missiles	..	..	4
Materiel Specialty Projects	..	..	36
453			
Common Subjects	..	..	(See above)
Total Hours	130	165	160

DEPARTMENT OF MODERN LANGUAGES

Department Head—James D. Wright; *Professors*—Robert M. Ervin, Joseph A. Campoamor; *Associate Professor*—George F. Walker, II; *Instructor*—Herald E. Lewald.

General

The Department of Modern Languages seeks first to give the student sufficient mastery of a foreign language to enable him to read and understand with reasonable facility the scientific and technical literature of that language. Further, it seeks to inform the student, through the medium of the foreign language, of the civilization and literature of the countries where that language is spoken.

A student taking a language in which he has two or more years of high-school credit must schedule the first quarter of the 200 series in that language. A student who elects to take courses in a language which he speaks as a native lanugage must also schedule the first quarter of the 200 series. Otherwise such students may schedule the beginning course of another language.

Credit for 200 courses will be given on a quarterly basis. Credit for 100 courses will be given only after completion of the full three quarters.

Students who are registered under the co-operative plan and who either elect to study a foreign language or are required to study one, are required to study German. This requirement is made necessary by the fact that German is the only foreign language in which all three elementary courses are normally offered each quarter—a situation which usually makes possible the scheduling of any first-year German course during any quarter and which, in the study of the other languages, usually makes possible the scheduling of only that first-year course which is reserved for the quarter in question. Accordingly students who are enrolled only every other quarter can easily complete the first year of their language study in German but might do so only with great loss of time in the other languages.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

M.L. 101. Elementary German 3-0-3.

Prerequisite: None. Mr. Wright and Staff

Pronunciation; essential principles of German grammar; rapid acquisition of vocabulary by the reading of simple selections; elementary composition.

Texts: Erika Meyer, *Elementary German;* Goedsche-Glaettli, *Cultural Graded Readers* (German Series: I).

M.L. 102. Elementary German 3-0-3.

Prerequisite: M. L. 101 or equivalent. Mr. Wright and Staff

Continuation and extension of the work of M.L. 101 by further presen-

tation of the principles of German grammar; introduction of additional reading material.

Texts: Erika Meyer, *Elementary German;* Goedsche-Glaettli, *Cultural Graded Readers* (German Series: II).

M.L. 103. Elementary German 3-0-3.

Prerequisites: M.L. 101 and 102 or equivalent. Mr. Wright and Staff

Reading of German scientific and general material and the acquisition of a large scientific vocabulary; continued study of German grammar; composition.

Texts: Erika Meyer, *Elementary German;* Erika Meyer, *German Graded Readers* (Book III); Flechtner, *Die Elemente.*

M.L. 107. Elementary French 3-0-3.

Prerequisite: None. Mr. Ervin and Staff

Essential principles of French grammar; acquisition of vocabulary through simple conversational exercises and the reading of simple selections.

Text: Sirich and Butler, *Introduction to French*

M.L. 108. Elementary French 3-0-3.

Prerequisite: M.L. 107 or equivalent. Mr. Ervin and Staff

A continuation of M.L. 107; extension of the survey of French grammar; acquisition of a large general vocabulary through conversation and the reading of texts dealing with French civilization and history.

Texts: Sirich and Butler, *Introduction to French;* Hills and Dondo, *La France.*

M.L. 109. Elementary French 3-0-3.

Prerequisites: M.L. 107 and 108 or equivalent. Mr. Ervin and Staff

Reading of selected texts; composition; completion of the survey of French grammar.

Texts: Sirich and Butler, *Introduction to French;* Hills and Dondo, *La France.*

M.L. 113. Elementary Spanish 3-0-3.

Prerequisite: None. Mr. Campoamor and Staff

Pronunciation; elementary grammar; reading and composition; simple conversational exercises.

Text: Sacks, *Spanish for Beginners.*

M.L. 114. Elementary Spanish 3-0-3.

Prerequisite: M.L. 113 or equivalent. Mr. Campoamor and Staff

Continuation of M.L. 113; further study of Spanish grammar; easy reading and composition; conversation.

Texts: Sacks, *Spanish for Beginners;* Grismer and Olmsted, *A México por Automóvil.*

M.L. 115. Elementary Spanish 3-0-3.

Prerequisites: M.L. 113 and 114 or equivalent.

Mr. Campoamor and Staff

A continuation of M.L. 114, with emphasis on the reading of selected texts; completion of Spanish Grammar.

Texts: Sacks, *Spanish for Beginners;* Robles, *Cartilla Española.*

M.L. 119. Elementary Russian 3-2-3.

Prerequisite: None. Mr. Wright

The course is conducted by a combination of the following methods: the study of conventional grammar in condensed form; the study of grammar as presented in type sentences; and the reading of selected elementary material. The entire course, which is designed to cover three quarters, will consist solely in the study of grammar for the first quarter and for the greater part of the second quarter.

Texts: A. v. Gronicka, *Essentials of Russian;* A. v. Gronicka, *Key to Essentials of Russian.*

M.L. 120. Elementary Russian 3-2-3.

Prerequisite: M.L. 119 or equivalent. Mr. Wright

A continuation of M.L. 119.

Texts: A. v. Gronicka, *Essentials of Russian;* A. v. Gronicka, *Key to Essentials of Russian;* Bond and Bobrinskoy, *Heath-Chicago Russian Series I, II, III.*

M.L. 121. Elementary Russian 3-2-3.

Prerequisites: M.L. 119 and 120 or equivalent. Mr. Wright

A continuation of M.L. 119 and 120. During this quarter the emphasis will be on the reading of simple prose.

Texts: A. v. Gronicka, *Essentials of Russian;* A. v. Gronicka, *Key to Essentials of Russian;* Bond and Bobrinskoy, *Heath-Chicago Russian Series I, II, III.*

M.L. 201. Intermediate German 3-0-3.

Prerequisite: Three Quarters of elementary German or equivalent.

Mr. Wright, Mr. Ervin

Reading of German scientific and technical material of greater difficulty; individual problems to conform, whenever possible, with the student's special branch of engineering.

Text: Wizinger, *German Science Readings.*

M.L. 202. Intermediate German 3-0-3.

Prerequisite: M.L. 201 or equivalent. Mr. Wright, Mr. Ervin

Reading of German prose in support of the development achieved in M.L. 201. Note: Both M.L. 201 and 202 are suitable courses for graduate students who have a knowledge of elementary German and who wish to prepare for reading-knowledge tests for advanced degrees.

Text: Puknat-Wiechert, *Zwei Novellen.*

M.L. 203. Advanced German 3-0-3.

Prerequisites: M.L. 201 and 202 or equivalent. Mr. Wright

Reading and discussion of selections from the German literature of the modern period, the emphasis on *Novellen.*

Text: Van Eerden and Ulmer, *Deutsche Novellen.*

M.L. 207. Intermediate French 3-0-3.

Prerequisite: Three quarters of elementary French or equivalent.
Mr. Ervin, Mr. Walker

Reading of novels and short stories intended to give the student a large general vocabulary; review of French grammar.

Text: Bazin, *Les Oberlé.*

M.L. 208. Intermediate French 3-0-3.

Prerequisite: M.L. 207 or equivalent. Mr. Ervin, Mr. Walker

A continuation of M.L. 207 with selected readings in the student's special field.

Texts: Miller, *First Readings in French Literature;* additional selected reading material.

M.L. 209. Advanced French 3-0-3.

Prerequisites: M.L. 207 and 208 or equivalent.
Mr. Ervin, Mr. Walker

Readings from French literature, including scientific selections.

Text: Alden, *Introduction to French Masterpieces.*

M.L. 213. Intermediate Spanish 3-0-3.

Prerequisite: Three quarters of Elementary Spanish or equivalent.
Mr. Campoamor, Mr. Walker

Review of grammar and composition; conversation; commercial terms; reading of more difficult material.

Texts: Brown and Castellano, *Shorter Spanish Review Grammar;* Robles, *Tertulias Españolas.*

M.L. 214. Intermediate Spanish 3-0-3.

Prerequisite: M.L. 213 or equivalent. Mr. Campoamor, Mr. Walker

Reading of advanced material; continuation of review of grammar and composition; conversation; applied engineering terms.

Texts: Brown and Castellano, *Shorter Spanish Review Grammar;* Crawford-Alarcón, *El Sombrero de Tres Picos.*

M.L. 215. Advanced Spanish 3-0-3.

Prerequisites: M.L. 213 and 214 or equivalent.
Mr. Campoamor, Mr. Walker

Reading of selected texts.

Texts: Levy, *Quince Cuentos Populares;* McHale, *El Comercio.*

DEPARTMENT OF MUSIC

Director—Walter C. Herbert; *Band Director*—Ben Logan Sisk; *Bandmaster-Emeritus*—A. J. Garing.

Musical activities at Georgia Tech are taking an increasingly important place in the life of the school. The courses offered for credit are band and instrumental work, choral music, history of music and music appreciation. It is hoped that many students will take advantage of these opportunities to secure a well-rounded and more complete course of study.

After making several concert tours through the eastern part of the United States for several successive years, the Glee Club went to Europe during the 1949 Christmas holidays under the auspices of the American Army to entertain troops in Germany and Austria over a three-week tour. A similar tour at Christmas, 1950, carried the Glee Club to Newfoundland, Labrador, Greenland and Bermuda, at the request of the U. S. Air Force.

In the last five consecutive years the Glee Club has made New Year's Eve appearances: 1950, Vienna, Austria; 1951, Hamilton, Bermuda; 1952, Miami, Florida, and 1953 and 1954 New Orleans, Louisiana.

The band makes several trips with the football team each year. During the winter season band concerts are presented on the campus and at local schools. The courses listed below add measurably to the proficiency of band members, and lead those qualified into the field of band conducting which is often followed as a pleasant and frequently profitable avocation.

Courses of Instruction

Music 201. Choral Music—History 1-2-1.

Prerequisites: 1. Satisfactory completion of three quarters in Glee Club.
2. Approval of the Director of Music. Mr. Herbert

Course will consist of two hours practical or laboratory work, rehearsing and performing choral music. Third hour will be given to study of the history and development of choral music, from Gregorian chant through Palestrina and Bach to the present.

Text: Stringham, *Listening to Music Creatively.*

Music 202. Choral Music—Conducting 1-2-1.

Prerequisites: 1. Satisfactory completion of three quarters in Glee Club.
2. Approval of the Directors of Music. Mr. Herbert

Laboratory work will consist of rehearsal and performance of choral music. Third hour will include practice conducting by the students.

Text: Bauman, *Elementary Musicanship.*

Music 203. Choral Music—Appreciation 1-2-1. Sophomore, Junior or Senior Year, Spring Quarter.

Prerequisites: 1. Satisfactory completion of three quarters in Glee Club.
2. Approval of the Director of Music. Mr. Herbert

Two hour periods will be spent in choral practice. The theoretical work

will consist of an introduction to the history of music in general, and an elementary treatment of music appreciation, with the use of records, sound films and other modern aids to the student.

Music 301. Marching Band 0-3-1. Junior or Senior Year, Fall Quarter.

Prerequisites 1. Satisfactory completion of three (3) quarters participation in band as a Freshman or Sophomore.
2. Approval of the band director. Mr. Sisk

Precision drilling. Special Maneuvers. Military Parade Procedure. (Students completing this course are expected to be able to direct as well as participate in these routines).

Text: Dvorak, *"The Marching Band."*

Music 302. Concert Band 0-3-1. Junior or Senior Year, Winter Quarter.

Prerequisites: 1. Satisfactory completion of three (3) quarters participation in band as a Freshman or Sophomore.
2. Approval of the band director. Mr. Sisk

Performance and appreciation of concert music. Baton technique and student conducting. Radio broadcasting technique.

Text: *"National School Band Manual."*

Music 303. Concert and Marching Band 0-3-1. Junior or Senior Year, Spring Quarter.

Prerequisites: 1. Satisfactory completion of three (3) quarters participation in band as a Freshman or Sophomore.
2. Approval of the band director. Mr. Sisk

Continuation of all procedures listed under Music 302 plus a resumption of the marching drill and performance which is begun in Music 301.

Text: *"National School Band Manual."* Dvorak, *"The Marching Band."*

DEPARTMENT OF NAVAL SCIENCE

(Established in 1926)

Naval Reserve Officers' Training Corps

Commandant and Professor of Naval Science—Captain Philip G. Stokes; *Executive Officer and Associate Professor*—Commander Frank J. Hill; *Assistant Professors*—Major William T. Miller (USMC); Lieutenant Commander Roy M. Sudduth, Lieutenants Donald H. Campbell, Richard A. Harris, James D. Hereford; Lieutenant Junior Grade Charles R. Merritt; *Instructors*—Chief Fire Controlman George A. Bork, Chief Quartermaster Paul R. Gardner, Chief Storekeeper Raymond S. Gent, Chief Gunners Mate Vernon Hand, Master Sergeant William L. Vick (USMC), Yeoman First Class John J. Pica; *Secretaries*—Mrs. Margaret Crone, Miss Cora W. Whitley.

General

Naval ROTC students are enrolled for the full four year period since the course is not divided into Basic and Advanced sections. Students desiring commissions in the Marine Corps or Supply Corps follow a different curriculum during the Junior and Senior years. Students may apply for commission in the Civil Engineer Corps or Flight Training during the Senior year.

The NROTC is composed of three types of students: Regular, Contract and Naval Science.

Regular Students

These students are appointed Midshipman, USNR, after nation-wide competitive examinations. They have their tuition, fees and textbooks paid by the Navy for a period not exceeding four years, are uniformed at government expense, and receive retainer pay at the rate of $600.00 per year. They must obligate themselves to complete the training periods of from six to eight weeks each summer, to accept a commission as Ensign, USN, or Second Lieutenant, USMC, upon graduation, and to serve on active duty for three years after commissioning unless earlier released by the Navy Department. At the beginning of the third year after commissioning, they will have the opportunity to apply for retention in the Regular Navy or Marine Corps, and will be so retained if selected under the quotas then in force. If they do not desire to remain in the Regular Navy they are ordered to inactive duty in the Naval Reserve for five years. At the end of this period their obligation to the Navy is fulfilled. Students in this classification will not be entitled to receive simultaneous education benefits under the G.I. Bill. These students are deferred from the draft.

Contract Students

These students are enrolled under the provision of the prewar legislation which remains in effect. They are uniformed at government expense, and during their junior and senior years are paid one commuted ration a day

(currently about $27.00 per month) while under instruction. They must obligate themselves to complete the prescribed Naval Science curriculum, to make one summer cruise of approximately three weeks during the summer between their junior and senior years, and to accept a commission on graduation as Ensign, USNR, or Second Lieutenant, USMCR. As a result of the Selective Service Act these students are deferred from the draft but must sign an agreement to serve on active duty for two years after commissioning if called by the Secretary of the Navy and remain a member of the Reserve Component of the U. S. Naval Service until the eighth anniversary of receipt of original commission. Upon graduation they may apply for commissions in the Regular Navy. Students receiving these benefits may receive them in addition to G.I. benefits to which they are entitled.

Naval Science Students

These students are those who merely select Naval Science courses as electives, have no contract with the Navy, have no assurance of ultimate commissioning, and derive none of the benefits available to Regular and Contract Students. They have no draft deferments.

Selection Procedure

Regular Students are selected in nation-wide competitive examinations held in December and the NROTC at Georgia Tech has no part in this selection, although information about the Regular Program is available.

To apply for the contract Program, a student must:

1. Be enrolled in Georgia Tech.
2. Be at least 17 and not over 21 years of age.
3. Be unmarried and never have been married.

Applicants are selected to fill the quota based on:

1. Physical qualifications.
2. Interview by Naval officers.
3. Score on Navy examination.
4. High School record.

Applicants should apply at the Naval Armory during the first day of Freshman Orientation Week for the Fall Quarter.

Naval Science students are selected in limited numbers only, usually to fill potential vacancies among Contract Students.

Three candidates may be nominated each year by the President of the Georgia Institute of Technology for competitive examinations for entrance to the United States Naval Academy. These nominations are normally made during the Winter Quarter from freshman Contract students.

Curriculum

All NROTC students follow the same curriculum during the freshman and sophomore years, attending three hours of Naval Science class a week and one hour of drill or laboratory.

During the sophomore year, students desiring commissions in the Supply Corps or the Marine Corps submit application to follow that curriculum during their junior and senior years. During the junior and senior years all NROTC students attend three hours of Naval Science class a week and two hours drill or laboratory.

FRESHMAN YEAR

NS 111—Naval History and Orientation 3-1-2
NS 112—Naval History and Orientation 3-1-2
NS 113—Naval History and Orientation 3-1-2

SOPHOMORE YEAR

NS 211—Naval Weapons 3-1-2
NS 212—Naval Weapons 3-1-2
NS 213—Naval Weapons 3-1-2

JUNIOR YEAR

NS 311—Navigation 3-2-3
NS 312—Navigation 3-2-3
NS 313—Navigation 3-2-3

SENIOR YEAR

NS 411—Leadership and Ship Stability 3-2-3
NS 412—Naval Machinery 3-2-3
NS 413—Diesel Engines and Naval Justice 3-2-3

Supply Corps Option

JUNIOR YEAR

NS 321—Naval Finance and Supply System 3-2-3
NS 322—Naval Accounting, Basic Supply Afloat 3-2-3
NS 323—Intermediate Supply Afloat 3-2-3

SENIOR YEAR

NS 421—Advanced Supply Afloat, Basic Ship's Store 3-2-3
NS 422—Advanced Ship's Store, Commissary, Clothing and Small Stores 3-2-3
NS 423—Naval Justice and Leadership 3-2-3

Marine Corps Option

JUNIOR YEAR

NS 331—Evolution of the Art of War 3-2-3
NS 332—Evolution of the Art of War and Modern Basic Strategy and Tactics 3-2-3
NS 333—Modern Basic Strategy and Tactics 3-2-3

SENIOR YEAR

NS 431—Amphibious Warfare, Part I 3-2-3
NS 432—Amphibious Warfare, Part II 3-2-3
NS 433—Leadership, Uniform Code of Military Justice 3-2-3

DEPARTMENT OF PHYSICAL TRAINING

Department Head—A. M. Coleman; *Professors*—Lyle B. Welser, Frederick R. Lanoue; *Associate Professors*—Norris C. Dean, Julian H. Pittard; *Assistant Professors*—John C. Hyder, Tommy Plaxico, James H. McAuley, John Foster; *Secretary*—Mrs. Forrest Harris.

General

All male students entering Georgia Institute of Technology as freshmen or sophomores are required to take Physical Training 4 hours per week, receiving 1 hour credit. The schedule will call for two two-hour periods on alternate days; one hour for physical training, thirty minutes for dressing and thirty minutes for shower. The annual physical examinations (see page 56) will determine any exemptions from physical training. Students bringing certificates of disability from personal physicians must have the certificates endorsed by the school physician before they will be accepted by the department.

All male freshman and sophomore students will be required to take Physical Training, except the following who will be exempt: Students not physically able; students twenty-one years of age, or over, on first admission to the Georgia Institute of Technology; veterans who have completed ninety or more days of service prior to their entrance in Georgia Institute of Technology, and students transferring from accredited colleges with at least eight quarter credit hours. Students transferring to the Georgia Institute of Technology with sophomore standing will be required to take three quarters of Physical Training only.

NOTE: Men excused from Physical Training are not required to make up the credit hours in additional subjects.

Students taking physical training will be required to purchase a standard uniform consisting of a sweat shirt, gym shirt, gym pants, athletic supporter, socks and shoes. The uniform will be sold at cost and normally should not exceed $12. Locker facilities for those living neither on the campus nor in nearby fraternity houses may be secured by a two-dollar deposit with a refund of $1.50 at the end of the school year if the lock and locker are surrendered in good condition. Dressing room space, showers and towels are provided all students free of charge.

Freshman Physical Training

The object of this course is to put the students in sound physical condition. One quarter will be devoted to swimming, one to gymnastics, and one to track and field. Swimming, tumbling, apparatus work, calisthenics, walking, running, jumping and throwing weights are basic to well rounded, sound physical development.

At the end of the year, students who make sufficient progress will be sent on to sophomore physical training.

P.T. 101. Swimming

Mr. Lanoue and Mr. McAuley

The breast stroke, side stroke, back stroke, crawl, treading water, under

water swimming, simple dives, water skills and life saving methods will be demonstrated. The primary objective of this course is SURVIVAL, and it is designed to "drownproof" our students. Emphasis is placed on developing the ability to successfully handle typical Armed Forces swimming emergencies, such as cramps, disabling injuries, and long submersions. The application of basic mechanical principles is stressed to make students think for themselves, rather than accept dogmatic statements.

P.T. 102. Gymnastics.

Mr. Welser and Mr. Foster

The purpose of the course will be to help orient the student through actual experience to some of the basic factors of physical fitness and to show how these factors tie in with greater achievement, not only in performing gymnastic movements, but with better all around physical performance and with higher social standards throughout life. Through the medium of 70 carefully chosen skills, it will be the goal to develop an appreciation of the significance of good coordination, efficiency of movement, rhythm, kinesthetic sense, confidence, courage, good form and team work, plus a wholesome philosophy of the real value of this type of activity. Each student shall earn his grade points and 60 points is essential as a minimum to pass the course. Points shall be distributed as follows:

1. First fitness test ..... 10 points
2. Second fitness test ..... 20 points
3. Sixty of the seventy skills at 1 point each ..... 60 points
4. Attitude, hygienic practices and sportsmanship ..... 10 points

100 points

P.T. 103. Track

Mr. Dean

Instruction and practice will be given in starting, striding, use of the arms in running, body lean, correct breathing, and hurdling. The object of the course is to build strong legs and to increase lung and heart capacity. To vary the work and keep it from being monotonous, the class will be divided into teams for games of basketball, softball, and touch football. The minimum score to pass the course is an average grade of 60 points covering the following five achievement tests.

1. The 100-yard run, 13 seconds, 60 points.
2. The one-mile run, 6 minutes 55 seconds, 60 points.
3. The 440-yard run, 69 seconds, 60 points.
4. The 220-yard dash, 29 seconds, 60 points.
5. The 440-yard dash, 75 seconds, 60 points.

SOPHOMORE PHYSICAL TRAINING

This is a maintenance course. The condition developed in the freshman year will be maintained and at the same time skills will be taught in games and other events that appeal to young men. Attendance, attitude and interest will be the factors that control the sophomore grades. One quarter will be devoted to indoor games, one to outdoor games, and one to recreative sports.

P.T. 201. Indoor Games

Mr. Hyder

Basketball and volley ball will be the two games on which the majority of effort will be concentrated. As the physical training facilities are expanded other games may be added. The basic fundamentals of the games will be demonstrated and practiced. After the class has developed some skill, teams will be organized for actual competition.

P.T. 202. Outdoor Games

Mr. Pittard and Mr. Foster

Softball and touch football are the basic games for this course. Baseball, soccer and tennis may be assigned those students who show enough aptitude. This course is an exact parallel to the Indoor Games in the methods used and in the instruction and play arrangement.

P.T. 203. Recreative Sports

Mr. Plaxico

This is a course consisting of miscellaneous sports. The class will receive instruction in paddle ball, tennis, hand ball, and very elementary instruction in golf.

The over all purpose of this course is: first, to give the student such activities that will make him phyiscally fit; secondly, to give him such instruction and motivation in these 'carry over' sports that he will continue to pursue one or more of these activities after completing the regular course.

SCHOOL OF PHYSICS

(Established in 1939)

Director—Joseph H. Howey; *Professors*—James E. Boyd, L. David Wyly; *Associate Professors*—Earle E. Bortell, Charles H. Braden, Vernon Crawford, Walter P. Ewalt, Harold M. Herreman, Edward T. Prosser, Thomas L. Weatherly, J. Quitman Williams; *Assistant Professors*—Harold R. Brewer, Harold A. Gersch, M. L. Meeks, Charles W. Tope*, O. B. Wike; *Instructors*—Edward L. Beeson, Eugene T. Patronis, Jr., Vincent W. Shiel; *Graduate Assistants*—Clifford D. Bailey, James H. Mauldin, Louis C. Wells; *Secretary*—Mrs. Alice McSloy; *Machinist*—R. E. Anderson.

General Information

Physics is primarily known as a basic science, but in recent years it has become increasingly important as an applied science in industry. Each year brings new increases in the volume of research work in industry and in the government laboratories, and scientific discoveries lead so quickly to practical applications that industry needs physicists to work side by side with engineers. There are also many industrial fields so new or so highly specialized that no specific engineering training is available, and for these physics offers the necessary background of high level general technical training. All of these factors, along with the increasingly complexity of industrial and military equipment, calls for the education of more physicists, and for the education of engineers with more fundamental training in physics.

The School of Physics meets the need for training in physics by offering basic service courses to all sophomores and by offering advanced work leading to a bachelor's, master's or doctor's degree in physics. The curriculum for the B.S. degree covers the general field of physics with provision for a liberal choice of electives to meet individual interests. In the undesignated option, the student may either choose electives from engineering courses that will prepare him for direct participation as a physicist in industry, or he may elect more advanced courses in science and mathematics to prepare him for a scientific career of the more traditional type.

OPTION IN GEOPHYSICS

A designated option in Geophysics is available, and students who wish this specialization should follow a different course of study in the junior and senior years as indicated below for this option. This course of study prepares students for work in geophysics, including the application of scientific methods to geophysical exploration.

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*On leave

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
Draw.	101-2-3	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	*	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in in the 200 series. German is recommended for students who expect to take graduate work after obtaining the bachelor's degree. It may be taken in the Freshman year, or in any other year as an approved elective.

SOPHOMORE YEAR

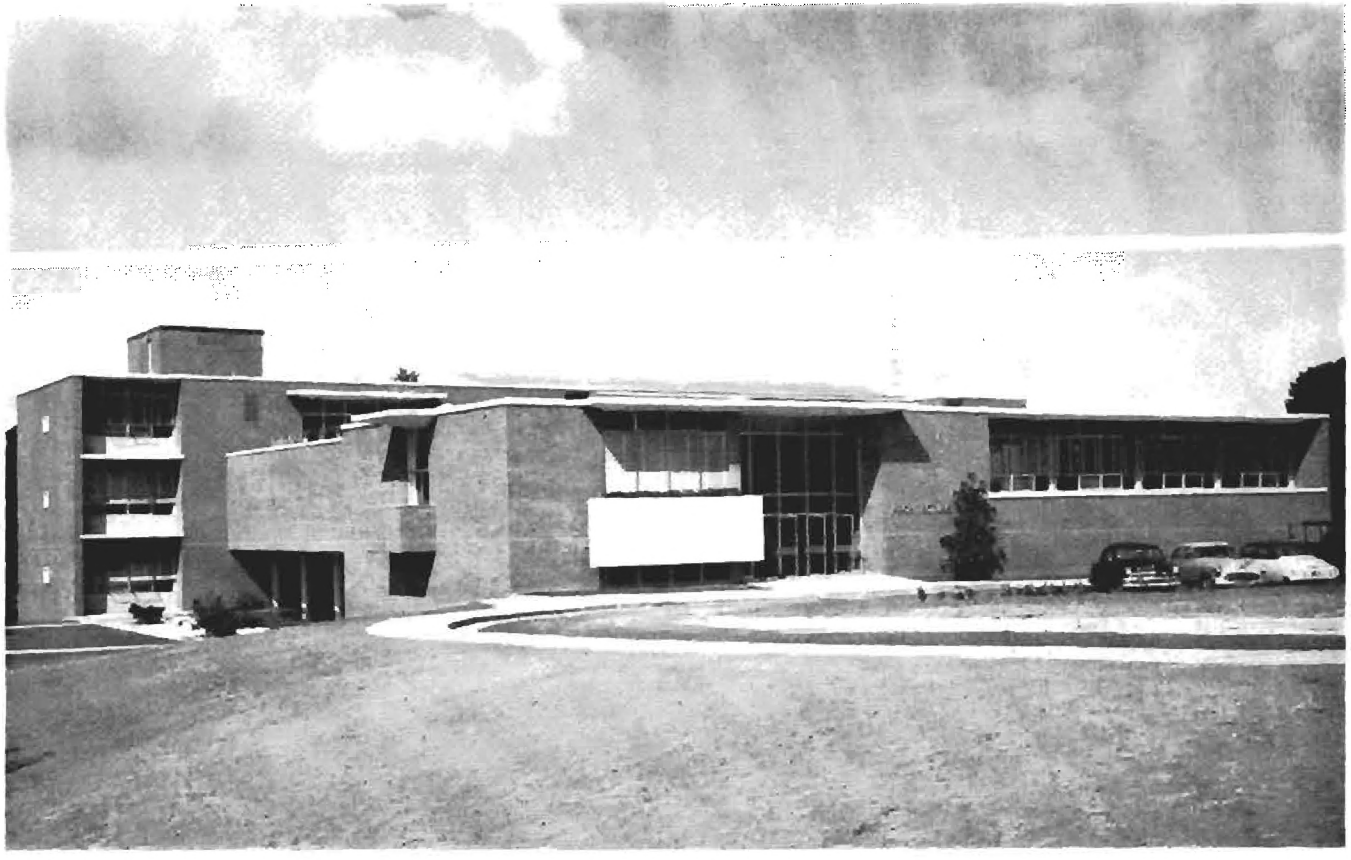
Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
M.E.	201-2	Machine Laboratory	0-3-1	0-3-1	....
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
Phys.	220	Laboratory Techniques	....	....	0-3-1
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Totals	16-11-18	16-11-18	16-11-18

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
S.S.	204	Economics	....	....	3-0-3
Eng.	315	Public Speaking	3-0-3	....	....
Math.	305-6	Differential Equations	3-0-3	3-0-3	....
Phys.	307	Intermediate Mechanics**	3-0-3	....	....
Phys.	308	Intermediate Electricity**	....	3-0-3	....
Phys.	310	Electricity and Magnetism	5-6-7	....	....
Phys.	320	Mechanics	....	5-0-5	....
Phys.	305	Laboratory Electronics	....	3-6-5	....
Phys.	313	Nuclear Physics	....	....	5-0-5
Phys.	315	Experimental Physics I	....	....	0-6-2
*Approved Electives			3-0-3	3-0-3	9-0-9
		Totals	17-6-19	17-6-19	17-6-19

*If Advanced Air or Military is one of the electives, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

**Students with satisfactory preparation may substitute approved electives for these courses with the consent of the School of Physics.



ARCHITECTURE BUILDING

Smith Resident Hall

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	321	Technical English	....	....	3-0-3
Mech.	331-2	Mechanics of Materials	3-0-3	2-0-2	....
Phys.	409	Atomic Physics	....	....	3-0-3
Phys.	422	Light	5-6-7	....	....
Phys.	425	Heat	....	4-3-5	....
Phys.	415	Experimental Physics II	....	....	0-6-2
*Approved Electives			9-0-9	12-0-12	12-0-12
		Totals	17-6-19	18-3-19	18-6-20

JUNIOR YEAR

Geophysics Option

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
S.S.	204	Economics	....	....	3-0-3
Eng.	315	Public Speaking	....	....	3-0-3
Math.	305-6	Differential Equations	3-0-3	3-0-3	....
Phys.	307	Intermediate Mechanics	3-0-3	....	....
Phys.	308	Intermediate Electricity	....	3-0-3	....
Phys.	310	Electricity and Magnetism	5-6-7	....	....
Phys.	320	Mechanics	....	5-0-5	....
Phys.	305	Laboratory Electronics	....	3-6-5	....
Phys.	313	Nuclear Physics	....	....	5-0-5
Phys.	315	Experimental Physics I	....	....	0-6-2
Geol.	201	General Geology	3-0-3	....	....
Geol.	414	Mineralogy	....	....	2-3-3
*Approved Electives			3-0-3	3-0-3	3-0-3
		Totals	17-6-19	17-6-19	16-9-19

SENIOR YEAR

Geophysics Option

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	321	Technical English	....	....	3-0-3
Mech.	331-2	Mechanics of Materials	3-0-3	2-0-2	....
Phys.	425	Heat	....	4-3-5	....
Geol.	305	Historical Geology	3-0-3	....	....
Geol.	312	Economic Geology	....	3-0-3	....
Geol.	424-5-6	Field Methods	0-6-2	0-6-2	0-6-2
Geol.	422	Structural Geology	....	2-6-4	....
Geol.	423	Introduction to Geophysics	....	....	3-3-4
*Approved Electives**			11-0-11	3-0-3	10-0-10
		Totals	17-6-19	13-15-19	16-9-19

*If Advanced Air or Military is one of the electives, credit will be 4-1-3. If Advanced Navy is the elective, credit will be 3-2-3.

**Including a minimum of 6 hr. chosen from Phys. 409, 415, 419, 422, 497.

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Phys. 204. Mechanics 3-0-3.

Prerequisite: Entrance Physics, Math. 201 or concurrent, and an acceptable amount of previous credit in physics. Staff

An intensive course in mechanics. Credits for this course is equivalent to credit for mechanics as required in Physics 207.

Text: Shortley and Williams, *Elements of Physics.*

Physics. 205. Electricity 3-0-3.

Prerequisites: Phys. 204, Math. 201, and an acceptable amount of other previous credit in physics.

An intensive course in electricity. Credit in this course is equivalent to credit for electricity as required in Physics 208.

Text: Shortley and Williams, *Elements of Physics.*

Phys. 206. Heat, Sound and Light 3-0-3.

Prerequisites: Phys. 204, Math. 201, and an acceptable amount of other previous credit in physics. Staff

An intensive course in heat, sound and light. Credit in this course is equivalent to credit for heat, sound and light as required in Physics 209.

Text: Shortley and Williams, *Elements of Physics.*

Phys. 207. Mechanics 5-3-6.

Prerequisite: Math. 201 or concurrent. Mr. Ewalt and Staff

Physics 207-8-9 together constitute a thorough course in basic physics for engineers. The five hours of class include one or two demonstration lectures per week. The solution of a large number of problems is required, and the course includes applications of the elements of calculus.

The laboratory work is designed to give practice in the art of making precise measurements, proficiency in the manipulation of apparatus and added familiarity with some of the concepts of physics. The theory of errors is stressed enough to give students the ability to decide under what conditions the greater expense of more precise measurement is justified.

Text: Shortley and Williams, *Elements of Physics.*

Phys. 208. Electricity 5-3-6.

Prerequisites: Phys. 207, Math. 201. Mr. Bortell and Staff

Electricity and related phenomena taught as a part of the basic physics course described under Physics 207.

Text: Shortley and Williams, *Elements of Physics.*

Phys. 209. Heat, Sound and Light 5-3-6.

Prerequisites: Phys. 208, Math. 201. Mr. Prosser and Staff

Heat, sound, light and atomic physics taught as a part of the basic physics course described under Physics 207.

Text: Shortley and Williams, *Elements of Physics.*

Phys. 211. Elementary Mechanics 4-0-4.

Prerequisite: Math. 102. Mr. Herreman and Staff

Physics 211-2-3 together constitute an elementary course in Physics which meets the requirements of some of the less technical engineering curricula. Considerable emphasis is placed on the solution of problems but no calculus is required. Intimate demonstrations of scientific equipment and methods are included under conditions which permit and require the individual students to observe the details.

Text: White, *Modern College Physics.*

Phys. 212. Elementary Electricity 4-0-4.

Prerequisite: Phys. 211. Mr. Herreman and Staff

Electricity and magnetism taught as a part of the elementary physics course described under Physics 211 above.

Text: White, *Modern College Physics.*

Phys. 213. Elementary Heat, Light and Sound 4-0-4.

Prerequisite: Phys. 211. Mr. Herreman and Staff

Heat, light, sound and modern physics taught as a part of the elementary physics course described under Physics 211 above.

Text: White, *Modern College Physics.*

Phys. 220. Laboratory Technique 0-3-1.

Prerequisite: Physics 209 or concurrently. Restricted. Staff

The methods, materials, and tools used in experimental physics, including the technique of observing and interpreting experimental data.

Phys. 305. Laboratory Electronics 3-6-5.

Prereqiusite: Physics 310. Mr. Howey

The properties of electronic devices considered as circuit elements, and their use in circuits which are frequently encountered in experimental physics, including power supplies, amplifiers, oscillators, electronic meters, electronic relays and scalers.

Text: Mitchell, *Fundamentals of Electronics.*

Phys. 307. Intermediate Mechanics 3-0-3.

Prerequisites: Phys. 207 and Math. 203. Mr. Wyly

Mechanics of particles, rigid bodies, and fluids; properties of matter; simple harmonic motion and wave motion. This course is taught with the free use of calculus.

Text: Sears, *Principles of Physics I.*

Phys. 308. Intermediate Electricity 3-0-3.

Prerequisites: Phys. 208 and Math. 203. Mr. Crawford

This course covers electric charge, current, electric fields, magnetic fields, potential, resistance, inductance, capacitance and sources of emf. These fundamentals are taught with the free use of differential and integral calculus.

Text: Sears, *Principles of Physics II.*

Phys. 310. Electricity and Magnetism 5-6-7.
Prerequisites: Phys. 209, Math. 305 or concurrently. Mr. Howey
The laboratory part of this course includes measurements of fundamental electric and magnetic quantities. The class work covers d.c. circuits, single phase a.c. circuits at all frequencies, electric oscillations, transients and transmission lines.
Text: Page and Adams, *Principles of Electricity.*

Phys. 313. Nuclear Physics 5-0-5.
Prerequisite: Phys. 209. Mr. Wyly
Elementary structure of the atom. Penetrating radiation. Natural radioactivity. Isotopes and nuclear structure. Radiation measurement instruments and technique. Particle acceleration. Nuclear reactions. Nuclear fission and chain reaction. Applied nuclear physics and health physics.
Text: Lapp and Andrews, *Nuclear Radiation Physics.*

Phys. 315. Experimental Physics I 0-6-2.
Prerequisite: Concurrent with Phys. 313. Restricted. Mr. Wyly
A selected group of experiments to parallel Phys. 313. Among those performed are the Oil Drop Experiment, ratio e/m, conduction through gases, X-ray absorption and diffraction, absorption of alpha, beta, and gamma rays, measurement techniques with electroscopes and Geiger counters, half-lives of radioactive materials and artificial radioactivity.
Text: *None.*

Phys. 318. Introduction to Modern Physics 4-3-5.
Prerequisites: Phys. 208 and 209 Mr. Braden
The structure of bulk matter and of atoms. Nuclear physics and the nature of elementary particles. Radiation, light, X-rays. Applications of modern physics and electronics.
Text: Semat, *Introduction to Atomic Physics.*

Phys. 319. Modern Physics for Engineers 3-0-3.
Prerequisites: Phys. 207-8-9 with a minimum grade of C.
This course covers the more recent developments of physics which are of particular importance for engineers. It includes the structure of bulk matter, the structure of atoms, the properties of elementary particles, the fundamentals of nuclear physics, and the interaction of radiation with matter.

Phys. 320. Mechanics 5-0-5.
Prerequisites: Physics 307, Math. 306, or concurrently. Mr. Wyly
Statics and dynamics of rigid bodies, with vector analysis and with application to oscillations, planetary motion, rotation of a rigid body, and impact.
Text: Stevenson *Mechanics and Properties of Matter.*

Phys. 405. Electronic Phenomena 3-0-3.
Prerequisite: Physics 308 or equivalent.
The physics of electronic phenomena and electronic devices. The subject matter includes the motion of charges in evacuated spaces, the conduction of electricity in gases, the electrical properties of solids, and the emission of electrons from solids.

Phys. 406. Applied X-Rays 3-0-3.

Prerequisite: Phys. 209.

Equipment for the production and measurement of X-rays. Absorption and scattering. Radiography. Crystallography and X-ray diffraction. Biological effects of radiation.

Phys. 409 Atomic Physics 3-0-3.

Prerequisites: Physics. 209, Math. 305.

The mass and charge of atomic particles. The structure of atoms. Optical spectra. Excitation and ionization potentials. Photoelectricity. The production and absorption of X-rays. The wave nature of material particles.

Text: Semat, *Introduction to Atomic Physics.*

Phys. 412. Electric and Magnetic Fields 5-0-5.

Prerequisites: Phys. 308 and 310, Math. 306. Mr. Crawford

Electric and magnetic fields, conductors, dielectrics, magnetic media, Maxwell's equations, electromagnetic waves, transmission lines, and wave guides.

Text: Skilling, *Fundamentals of Electric Waves.*

Phys. 415. Experimental Physics II 0-6-2.

Prerequisite: Phys. 305.

Special experiments from various fields of physics. Emphasis is placed on good laboratory technique.

Text: *None.*

Phys. 419. Acoustics 3-0-3.

Prerequisites: Physics 307 and 310 or equivalent.

An introduction to vibration, acoustic waves, mechanical sound generators, electro-acoustical and electro-mechanical transducers, underwater sound, hearing, and architectural acoustics.

Phys. 422. Light 5-6-7.

Prerequisites: Phys. 209, Math. 306 or concurrent. Mr. Crawford

Reflection and refraction of light by plane and spherical surfaces. Optical instruments. Dispersion, diffraction, interference, and polarization. Color.

Text: Morgan, *Geometrical and Physical Optics.*

Phys. 425. Heat 4-3-5.

Prerequisites: Phys. 209, Math. 306 or concurrent.

Introduction to the concepts and measuring techniques associated with temperature, heat transfer, specific heat, phase changes, calorimetry, thermal radiation, thermal conduction in solids and gases. Conservation of energy. Refrigeration and heat cycles. The absolute temperature scale.

Text: Zemansky, *Heat and Thermodynamics.*

Phys. 429. Special Problem 1-3-2.

Prerequisite: The scheduling of this course must be approved by the School of Physics. Staff

Each student is required to give extended study to some problem in physics to develop research technique, and to become familiar with the use of the library in physics.

Text: *None.*

Phys. 497. Theory of Measurements and Instrumentation 3-0-3.

Prerequisites: Phys. 208 and 209 and Differential Equations.

An operational consideration of physical measurements and measuring instruments. The topics to be covered include sensitivity; time of response; precision; accuracy; types of errors and the extent to which they may be dealt with by the "theory of errors"; thermal noise as the limit of precision in instruments; instruments that "count" compared with those that give some continuous response; and the instrument design. Specific instruments are considered as examples of general principles.

Text: Trimmer, *Response of Physical Systems.*

GRADUATE COURSES OFFERED

Phys.	606	The Theory and Practice of X-Rays	3-0-3
Phys.	611	Mechanics of Continuous Media	3-0-3
Phys.	616	Statistical Mechanics I	5-0-5
Phys.	621	Theoretical Mechanics	5-0-5
Phys.	624	Nuclear Physics	5-0-5
Phys.	627	Introduction to Quantum Mechanics	5-0-5
Phys.	628	Electromagnetic Theory I	5-0-5
Phys.	707	Solid State Physics	3-0-3
Phys.	711-12-13	Graduate Laboratory	1-6-3
Phys.	716	Statistical Mechanics II	3-0-3
Phys.	721	Advanced Classical Mechanics	3-0-3
Phys.	724	Theoretical Nuclear Physics	5-0-5
Phys.	727	Quantum Mechanics II	5-0-5
Phys.	728	Electromagnetic Theory II	5-0-5
Phys.	731	Molecular Spectra and Structure	5-0-5

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

DEPARTMENT OF PSYCHOLOGY

Department Head—Joseph E. Moore; *Assistant Professors*—Edward H. Loveland, M. Carr Payne, Jr.; *Secretary*—Lillian Gulley.

Courses of Instruction

Psy. 301. Introductory Psychology 3-0-3.

Prerequisite: Junior standing. Mr. Payne

Special stress is placed on the characteristics of human behavior, heredity, individual differences, emotions, sensory functions, learning, perceiving, social behavior, thinking, and personality.

Psy. 302. Applied Psychology 3-0-3.

Prerequisite: Junior standing. Mr. Payne

Emphasis will be given to applying psychological principles to the problem of everyday life. The use of psychology in advertising, business, education, law and criminology, medicine, politics, social adjustments and selling will be discussed.

Psy. 401. Industrial Psychology 3-0-3.

Prerequisite: None. Mr. Loveland and Mr. Moore

This course seeks to orient the student to the applications of psychology to business and industry. Attitudes, selection, placement, training, job analysis, time and motion study, incentives, testing, interviews, advertising and consumer research are some of the topics surveyed. The social foundations of industrial psychology are stressed. Attention is focused on the whole man—his fears and aspirations, his frustrations and gratifications.

Psy. 402. Psychology of Adjustment 3-0-3.

Prerequisite: Psy. 301. Mr. Moore

This course will deal with the typical individual and the social adjustment problems of normal people. Its chief aim will be to assist the student better to understand himself and his fellow man. The primary approach will be from the view point of objective psychology.

Psy. 403. Introduction to Psychological Testing 3-0-3. Fall Quarter.

Prerequisite: Psy. 401. Mr. Loveland

This course deals with psychological tests and measurement. Applications in business and industry are emphasized. Uses and abuses, advantages and limitations of the more commonly used types of tests are discussed. Students have opportunities to administer, take, score, interpret, construct, and evaluate certain tests. Individual problems are assigned. The aim of the course is to provide the student with sufficient background so that, as a businessman or engineer, he will be able to exercise sound judgment concerning the uses of tests and measurements in the management of men. No test experts will be created.

Psy. 404. Psychology of Advertising 3-0-3. Winter Quarter.
Prerequisites: Psy. 301 and 401. Mr. Payne
An analysis of the psychological factors which govern buying activities of consumers. These and other facts are combined to establish the psychological foundations of effective advertising and selling. The psychological aspects of such topics as product testing, advertising media research, copy testing, and consumer and audience research will be discussed.

Psy. 405. Psychological Aspects of Personnel Management 3-0-3. Spring Quarter.
Prerequisite: Psy. 401. Mr. Loveland
The purpose of this course is to provide prospective business and industrial executives with a comprehensive knowledge of the techniques employed by industrial and personnel psychologists in industry. Such topics as the development and use of psychological tests and criterion measures, the applications of proven principles of learning and motivation to the construction of training programs, interviewing and counseling of employees, and the theory and construction of rating scales will be discussed in detail.

Psy. 406. Psychological Statistics 2-3-3. Fall Quarter.
Prerequisite: Permission of the instructor. Mr. Loveland
A study of the applications of statistical techniques to the description, prediction, and control of human behavior. Methods of evaluating psychological tests, individual differences, merit rating scales and personnel selection and training programs will be discussed in detail. Emphasis will be placed upon the logical aspects of the statistics studied.

Psy. 407. Experimental Psychology 2-3-3. Spring Quarter.
Prerequisite: Psychology 301. Mr. Payne
An introduction to psychological measurement and laboratory techniques. Students will plan, conduct, evaluate, and report experiments dealing with such topics as visual, auditory, tactual, and kinesthetic perception; learning; group dynamics; motivation; sensori-motor coordination; and human feedback systems. Emphasis will be placed on the applications of the methods of science to the experimental study of human behavior.

Psy. 408. Psychological Methods for City Planners. 3-0-3. Winter Quarter
Prerequisite: Senior standing. Mr. Moore
Psychological methods applied to the solution of typical planning problems; development of individual leadership through student participation in planning situations; psychological aspects involved in the planning and carrying out of an urban redevelopment project in C.P. 613.

Psy. 601. Advanced Industrial Psychology 3-0-3. Fall Quarter.

Psy. 602. Applied Experimental Psychology 3-0-3. Winter Quarter.

Psy. 603. Social Psychology 3-0-3. Spring Quarter.

Psy. 704. Special Problems in Industrial Psychology. Credit to be arranged. Each Quarter.

DEPARTMENT OF PUBLIC HEALTH AND BIOLOGY

Department Head—Hugh A. Wyckoff; *Professor*—Robert S. Ingols; *Associate Professor*—Albert E. Cannon; *Special Lecturers*—L. M. Petrie, J. W. Lemon.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

P.H. 201. Introduction to Biology 3-3-4.

Prerequisite: None. Mr. Cannon

Fundamental principles and theories of biology. Study of the various invertebrate forms.

Text: Villee, *Biology.*

P.H. 202. Introduction to Biology 3-3-4.

Prerequisite: P.H. 201. Mr. Cannon

Continuation of P.H. 201.

Text: Villee, *Biology.*

P.H. 203. Comparative Anatomy 2-6-4.

Prerequisite: P.H. 202. Mr. Cannon and staff

Study of the comparative anatomy of the vertebrates with laboratory dissection of the several vertebrate forms.

P.H. 307. General Bacteriology 3-4-4. Junior.

Prerequisite: P.H. 202. Mr. Wyckoff

An elementary course to familiarize the student with the characteristics of bacteria and their relation to disease and sanitation, and the place they occupy in everyday life.

Text: Krueger, *Principles of Microbiology.*

P.H. 316. Industrial Hygiene 3-0-3.

Mr. Cannon and staff

Problems of health in industry; industrial poisons, occupational hazards and diseases, industrial fatigue, ventilation, and accident prevention.

Text: References. Cannon, *Outline of Industrial Hygiene.*

P.H. 320, 321. Water and Sewage Analysis 2-6-4.

Prerequisites: Chem. 103, P.H. 201. Mr. Ingols

A lecture and laboratory course to acquaint the sanitary engineer with the theory and practice of the standard methods for analysis of water and sewage.

Texts: *Standard Methods for the Examination of Water & Sewage,* A.P.H.A.; *Quantitative Analysis,* Kanning.

P.H. 406. Human Physiology 4-0-4.

Prerequisites: P.H. 202, 307. Staff

A study consisting of lectures and demonstrations, of the structure and functioning of the human body, together with those conditions which interfere with normal functioning.

P.H. 411. Sanitation 3-0-3.

Prerequisites: P.H. 201, 307. Mr. Wyckoff and staff

The principles of sanitation, water supplies, sewage and refuse disposal food sanitation, and inspection methods.

Text: Ehlers and Steel, *Municipal and Rural Sanitation.*

GRADUATE COURSES OFFERED

P.H.	603-4	Parasitology	3-3-4
P.H.	605-6	Sanitary Bacteriology	2-4-3
P.H.	610	Human Physiology	4-0-4
P.H.	617	Industrial Hygiene	3-0-3
P.H.	618	Industrial Hygiene Field Investigations	
P.H.	620-1-2	Sanitary Chemistry	2-3-3
P.H.	625	Microbiological Fermentations	3-0-3
P.H.	701	Stream Pollution	2-3-3
P.H.	702	Public Health Engineering Field Practices	0-6-2
P.H.	703	Public Health Administration	4-0-4
P.H.	704-5-6	Special Problems	

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

DEPARTMENT OF SOCIAL SCIENCES

Department Head—Glenn N. Sisk; *Associate Professor*—Robert S. Scharf; *Assistant Professors*—William R. Gable, Edward A. Gaston, Jr., George Hendricks, Samuel J. Mantel, Jr., N. Z. Medalia, John E. Tsouderos, Kenneth C. Wagner; *Lecturers*—Richard H. Leach, Gaines W. Walter, Willard E. Wight; *Secretary*—Mrs. Joyce Connally.

General Information

The Department of Social Sciences has as its main objective teaching students to understand human relations, and it serves the college as an integral part of the program of general education. To be a fully educated person the engineer must have a broad background of general training in fields not specifically technical. Freshmen are required to take either Social Sciences 105, 106 and 107, or Modern Language.

The Department has designated Social Sciences 105, 106, 107, 204, 327, 324, 331, 347, and 411 as courses in its General Education Program. The term, General Education, has come to mean a body of fundamental knowledge, skills, and insights which constitute the basis for "universal discourse" of all educated citizens. The courses above represent fundamental elements for understanding people drawn from the fields of history, government, sociology, economics, and philosophy. Some of the courses are required, some elective. The student may well consider them in choosing his program from quarter to quarter.

The central focus of the work of the Department is upon the student and his development. Student-centered teaching rather than subject matter is stressed.

Courses of Instruction

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

S.S. 105. Western Civilization 3-0-3.
Prerequisite: None. Staff
The fundamentals of Western history and culture are discussed under the three headings of personality, work and community. Materials from history and the various social sciences are used to convey a deep, broad concept of the basic factors, past and present, in Western society.
Text: Naftalin, *An Introduction to Social Science.*

S.S. 106. Western Civilization 3-0-3.
Prerequisite: None. Staff
Continuation of S.S. 105.
Text: Naftalin, *An Introduction to Social Science.*

S.S. 107. Government of the United States 3-0-3.
Prerequisite: None. Staff
A study of the structure and functions of the American and Georgia governments. *It gives exemption from the United States and Georgia constitution examination.*
Text: Burns and Peltason, *Government By the People* (Rev. Ed.).

S.S. 204. Economics 3-0-3.

Prerequisite: Sophomore standing. Mr. Scharf, Mr. Mantel

This course is designed for engineering students who are unable to take the full year's course in economics. Economic problems relating to engineering are given special emphasis.

Text: Gayer, Harriss, et. al., *Basic Economics.*

S.S. 208. Basic Sociology (Social Organization) 3-0-3.

Prerequisite: None. Mr. Medalia

While discussing the various sociological aspects of the modern family, the church, the factory, and other contemporary institutions, this course will provide an introduction to the theory of social organization.

Text: *Selected Readings.*

S.S. 305. Nineteenth Century Europe 3-0-3.

Prerequisite: None. Mr. Hendricks

A survey of modern European history from the French Revolution to 1914.

Text: Bruun and Commager, *Europe and America Since 1492.*

S.S. 306. World Problems Since 1914 3-0-3.

Prerequisite: None. Mr. Sisk

World history since 1914 with emphasis, upon international relations.

Text: Bruun, *The World in the Twentieth Century.*

S.S. 307. American Economic History 3-0-3.

Mr. Hendricks

Special attention is given to the rise of technology, our industrial system, the westward movement, the development of our banking system, and government regulation of industry.

Text: Johnson and Krooss, *Origins and Development of the American Economy.*

S.S. 310. Contemporary Social Problems (Social Disorganization) 3-0-3.

Prerequisite: Junior standing. Mr. Tsouderos

An attempt is made to analyze by means of basic sociological principles such problems of contemporary society as poverty, unemployment, health, race relations, divorce, defectiveness, and delinquency. Various proposed remedies are studied. Regional problems of the South are treated.

Text: Gillin, et. al., *Social Problems.*

S.S. 313. The Problems of Public Opinion 3-0-3.

Prerequisite: Junior standing. Mr. Gaston

This course is devoted to the study of the techniques and uses of propaganda and to methods and criteria for its analysis. Attention is given to its application in industry and to its uses by social and political pressure groups. The vehicles of propaganda—the newspaper, radio, television, screen, and stage—are given attention and their relative importance studied.

Text: Doob, *Public Opinion.*

S.S. 314. Society and the Individual 3-0-3

Prerequisite: Junior standing Mr. Gaston

While considering the influence of the group and culture upon the individual, this course will provide an introduction to the theory of culture and personality.

Text: Faris, *Social Psychology.*

S.S. 319. History of the South 3-0-3.

Prerequisite: Junior standing. Mr. Sisk

The growth of the South's economic, social, and political life since 1820. Special emphasis is given to those factors which have played an important part in the progress of Georgia. Current regional problems are considered. *Exemption from United States and Georgia history examination.*

Text: Simkins, *History of the South.*

S.S. 320. Land Economics 3-0-3.

Prerequisite: Junior standing Mr. Mantel

This course deals with city growth, appraising problems, and urban land utilization. Housing problems are given special attention.

Text: Ratcliff, *Urban Land Economics.*

S.S. 323. American Constitutional Problems 3-0-3.

Prerequisite: Junior standing. Mr. Gable, Mr. Mantel

This is an advanced course in the government of the United States and Georgia, taught largely through the medium of constitutional law. Such significant problems as federalism, separation of powers, and civil liberties are studied. *Exemption from United States and Georgia constitution examination.*

Text: Heller, *Introduction to American Constitutional Law.*

S.S. 324. Georgia State and Local Problems 3-0-3.

Prerequisite: None. Mr. Hendricks

This is a course in the operation of Georgia government, and in the problems which confront the State of Georgia. The historical, social, economic, and political life of Georgia is studied. *Exemption from Georgia History and constitution examination.*

Text: Meadows, *Modern Georgia.*

S.S. 327. American Political and Social History to 1876 3-0-3.

Prerequisite: None. Mr. Sisk

Readings on colonial America, the American Revolution, the framing of the Constitution, Jeffersonian democracy, sectionalism, the slavery question, and secession. Attention is given to the place of the United States in the family of American nations and in world history. The Civil War-Reconstruction periods are considered. *Exemption from United States and Georgia history examination.*

Text: Parkes, *The United States of America, A History.*

S.S. 328. American Political and Social History Since 1876 3-0-3.

Prerequisite: None. Mr. Sisk

A continuation of S.S. 327. Readings on the restoration of home rule in the South, the Granger movement, business and politics, tariff and trust problems, imperialism and party politics, foreign relations, and international affairs. Latin-American relations are stressed. *Exemption from United States and Georgia history examination.*

Text: Parkes, *The United States of America, A History.*

S.S. 331. Introductory Philosophy 3-0-3.

Prerequisite: None. Mr. Scharf

Ancient and modern systems of philosophy interpreted in terms of modern life problems. Philosophy as related to political government, social ethics, economics, and comparative religion. Philosophy applied to moral problems in marriage.

Text: Davidson, *Philosophies Men Live By.*

S.S. 347, 348. Foundations of National Power and International Relations 3-0-3.

Prerequisite: Junior standing. Mr. Gable, Mr. Mantel

This course is designed to acquaint the student with the United States' power position in world affairs, relative to that of other powers, and with the events in the world today which have an impact on that position. International relations are emphasized.

Text: Sprout, *Foundations of National Power.*

S.S. 401. Municipal and County Government 3-0-3.

Prerequisite: Senior standing and S.S. 107, or consent of instructor.
Mr. Gable

An analysis of local government, with particular emphasis on the mechanics and functions of city and urban county government units.

Text: Anderson and Weidner, *American City Government.*

S.S. 411, 412. Industrial Sociology and Anthropology (Technology and Society) 3-0-3.

Prerequisite: Senior or Graduate Standing. Open to Graduate Students.
Mr. Wagner

S.S. 411 deals with the problems and patterns of human relations in industry, fitting these problems into the community setting. Materials are drawn from the fields of anthropology, sociology, and industrial relations. Comparative cultural materials, field research projects, and practical contact with industrial problems are used as aids in understanding industrial relations. The social role of the engineer in the factory is an important theme.

Text: Gardner and Moore, *Human Relations in Industry* (Rev. Ed.).

S.S. 412 examines the impact of technology on society from the historical point of view, and deals with the engineer's role in society from a broad perspective.

Text: *Selected readings.*

S.S. 415. Urban Sociology 3-0-3.

Prerequisites: Senior or Graduate Standing and S.S. 105 or S.S. 106 or S.S. 208. Mr. Medalia

A study of the problems of economic, religious, and social institutions in modern urban life. Field experience and research illustrate and apply the theoretical materials of the course.

Text: Gist and Halbert, *Urban Society.*

THE A. FRENCH TEXTILE SCHOOL

(Established in 1899)

Director—Herman A. Dickert; *Professors*—James L. Taylor, Ralph L. Hill, Charles A. Jones (Emeritus); *Associate Professors*—Gerald B. Fletcher, J. Weldon McCarty; *Assistant Professors*—William Postman, Ralph C. Lathem; *Instructors*—Sam M. Willis, Thomas D. Efland; *Secretary*—Mrs. Thelma C. Saggus; *Building Engineer*—H. G. Adams.

General

This school, housed in the modern Harrison Hightower Textile Building, offers courses leading to the degree of Bachelor of Textile Engineering as well as courses leading to the degree of Bachelor of Science in Textiles. The work leading to the Bachelor of Science in Textiles degree may be taken in one of two options, viz., Textile Chemistry and Dyeing, or Textile Manufacturing. Each degree may be taken as a regular four-year course, or in accordance with the five-year co-operative plan.

Graduate courses are also provided leading to the degree of Master of Science in Textile Engineering and Master of Science in Textiles.

The school is vitally interested in serving the expanding textile industry, and the courses provided have as their objective the training of students for employment in this industry and its related branches.

During the first two years the work is largely fundamental, including the basic courses of Mathematics, Physics, and Chemistry, followed by more specialized training in the field of Textiles during the Junior and Senior years.

Instruction through classroom, library, and experimental laboratory practice is arranged to give both a theoretical and practical understanding of textile procedure. Original work on the part of the student is encouraged in both regular and graduate courses.

Supervised mill visits to textile plants in this area are made periodically by Junior and Senior classes, thus giving the student contact with industry, and textile operations on a production scale.

FRESHMAN YEAR

NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	101-2-3	Inorganic Chemistry	3-3-4	3-3-4	3-3-4
*Draw.	101-2-3	Engineering Drawing	0-6-2	0-6-2	0-6-2
Eng.	101-2-3	Composition and Rhetoric	3-0-3	3-0-3	3-0-3
Math.	101	Algebra	5-0-5	....	....
Math.	102	Trigonometry	....	5-0-5	....
Math.	103	Analytical Geometry	....	....	5-0-5
M.L.	**	Modern Language OR			
S.S.	105-6-7	Social Science	3-0-3	3-0-3	3-0-3
P.T.	101-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	101-2-3	Military or Naval Instruction	3-1-2	3-1-2	3-1-2
Gen.	101	Orientation	1-0-0	....	....
		Totals	18-14-20	17-14-20	17-14-20

*Manufacturing option students take Drawing 106.

**Choice of M.L. 101-2-3, German; M.L. 107-8-9, French; or M.L. 113-14-15, Spanish. Three Quarters of either M.L. or S.S. are required. A student having had two years of a language in high school and wishing to continue work in this language must schedule courses in the 200 series.

PROGRAM FOR B. OF TEXTILE ENGINEERING DEGREE

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
Tex.	309-313	Fabric Design	2-3-3	3-0-3	....
Tex.	314	Fabric Analysis	....	....	2-3-3
		Totals	18-11-20	19-8-20	18-11-20

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
S.S.	204	Economics for Engineers	3-0-3	....	....
E.E.	316-7	Applied Electricity	3-0-3	2-3-3	....
Mech.	301-2-3	Applied Mechanics	2-0-2	2-0-2	3-0-3
Mech.	331-2	Mechanics of Materials	....	3-0-3	2-0-2
M.E.	320	Thermodynamics	....	....	4-0-4
Tex.	204-5-6	Principles of Fiber Processing	3-3-4	3-3-4	3-3-4
Tex.	223-4-5	Weaving	3-3-4	3-3-4	3-0-3
Tex.	332	Basic Circular Knitting	....	1-3-2	....
Electives			3-0-3	3-0-3	3-0-3
		Totals	17-6-19	17-12-21	18-3-19

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
I.M.	317	Industrial Marketing	....	....	3-0-3
I.M.	407	Personnel Management	3-0-3	....	....
Psy.	401	Industrial Psychology	....	....	3-0-3
M.E.	332	Elementary Heat Power Engineering	3-0-3	....	....
M.E.	351	Fuels Laboratory	....	....	0-3-1
M.E.	467-8	Machine Design	3-3-4	4-3-5	....
Eng.	321	Technical English	3-0-3	....	....
Tex.	401	Cotton Classing	....	0-3-1	....
Tex.	420	Standard Fabrics	....	....	3-0-3
Tex.	431	Physical Textile Testing	....	....	1-3-2
Tex.	443	Bleaching and Dyeing	3-3-4	....	....
Tex.	444	Dyeing and Finishing of Natural Fibers	....	3-3-4	....
Tex.	447	Textile Costing	....	3-0-3	....
Tex.	450	Textile Calculations	....	3-0-3	....
Tex.	451	Mill Engineering	....	....	3-0-3
Tex.	454	Seminar	....	1-0-1	....
Electives			3-0-3	3-0-3	3-0-3
		Totals	18-6-20	17-9-20	16-6-18

PROGRAM FOR B.S. IN TEXTILES

Textile Chemistry and Dyeing Option

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	211-14-15	Analytical Chemistry	4-0-4	2-6-4	2-6-4
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	201-2-3	Calculus	5-0-5	5-0-5	5-0-5
Phys.	207-8-9	Physics	5-3-6	5-3-6	5-3-6
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
		Totals	20-8-21	18-14-21	18-14-21

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	307-8-9	Organic Chemistry	3-3-4	3-3-4	3-3-4
Chem.	331-2-3	Physical Chemistry	3-0-3	3-0-3	3-0-3
Chem.	334-5-6	Physical Chemistry Laboratory	0-3-1	0-3-1	0-3-1
Eng.	321	Technical English	3-0-3	....	....
Tex.	204-5-6	Principles of Fiber Processing	3-3-4	3-3-4	3-3-4
Tex.	309-313	Fabric Design	2-3-3	3-0-3	....
Tex.	443	Bleaching and Dyeing	....	....	3-3-4
Electives			3-0-3	3-0-3	3-0-3
		Totals	17-12-21	15-9-18	15-12-19

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Tex.	314	Fabric Analysis	....	....	2-3-3
I.M.	407	Personnel Management	3-0-3	....	....
Psy.	401	Industrial Psychology	....	....	3-0-3
Tex.	223-4-5	Weaving	3-3-4	3-3-4	3-0-3
Tex.	428-9	Synthetic Fibers	2-0-2	2-0-2	....
Tex.	431-2	Physical Textile Testing	1-3-2	1-3-2	....
Tex.	437	Chemical Textile Testing	....	....	2-3-3
Tex.	444	Dyeing and Finishing of Natural Fibers	3-3-4	....	....
Tex.	446	Dyeing and Finishing of Synthetics	....	3-3-4	....
Tex.	447	Textile Costing	....	3-0-3	....
Tex.	454	Seminar	1-0-1	....	....
Tex.	460	Finishing and Printing	....	3-0-3	....
Tex.	461	Chemical Treatments for Textiles	....	....	3-0-3
Electives			3-0-3	3-0-3	3-0-3
		Totals	16-9-19	18-9-21	16-6-18

PROGRAM FOR B.S. IN TEXTILES

MANUFACTURING OPTION

SOPHOMORE YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
S.S.	204	Economics for Engineers	3-0-3	....	....
Eng.	201-2-3	Survey of the Humanities	3-0-3	3-0-3	3-0-3
Math.	210	Mathematics of Finance	....	3-0-3	....
Phys.	211-12-13	Physics	4-0-4	4-0-4	4-0-4
P.T.	201-2-3	Physical Training	0-4-1	0-4-1	0-4-1
ROTC	201-2-3	ROTC	3-1-2	3-1-2	3-1-2
Tex.	201	Raw Materials	3-0-3	....	....
Tex.	207-8	Yarn Manufacturing	....	3-3-4	3-3-4
Tex.	309-11-12	Fabric Design	2-3-3	3-0-3	3-0-3
		Totals	18-8-19	19-8-20	16-8-17

JUNIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
Chem.	307-8-9	Organic Chemistry	3-3-4	3-3-4	3-3-4
I.M.	317	Industrial Marketing	....	3-0-3	....
Eng.	321	Technical English	3-0-3	....	....
M.E.	267	Kinematics of Mechanism	3-0-3	....	....
Tex.	306-7-8	Yarn Manufacturing	3-3-4	3-3-4	3-3-4
Tex.	223-4-5	Weaving	3-3-4	3-3-4	3-0-3
Tex.	314	Fabric Analysis	....	....	2-3-3
Tex.	332	Basic Circular Knitting	....	1-3-2	....
Tex.	333	Basic Warp Knitting	....	....	1-3-2
Electives			3-0-3	3-0-3	3-0-3
		Totals	18-9-21	16-12-20	15-12-19

SENIOR YEAR

Course	*No.*	*Subject*	*1st Q.*	*2nd Q.*	*3rd Q.*
I.E.	416	Motion and Time Study	2-3-3	....	....
I.M.	407-8	Personnel Management Principles-Problems	3-0-3	3-0-3	....
I.M.	447	Statistics	....	3-0-3	....
Psy.	401	Industrial Psychology	3-0-3	....	....
Tex.	401	Cotton Classing	0-3-1	....	....
Tex.	420	Standard Fabrics	....	....	3-0-3
Tex.	431-2	Physical Textile Testing	1-3-2	1-3-2	....
Tex.	422	Jacquard Design and Weaving	....	....	2-3-3
Tex.	437	Chemical Textile Testing	....	2-3-3	....
Tex.	443	Bleaching and Dyeing	3-3-4	....	....
Tex.	444	Dyeing and Finishing of Natural Fibers	....	3-3-4	....
Tex.	446	Dyeing and Finishing of Synthetics	....	....	3-3-4
Tex.	447-9	Textile Costing	....	3-0-3	3-0-3
Tex.	451	Mill Engineering	....	....	3-0-3
Tex.	454	Seminar	....	....	1-0-1
Electives			3-0-3	3-0-3	3-0-3
		Totals	15-12-19	18-9-21	18-6-20

COURSES OF INSTRUCTION

NOTE: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit.

Tex. 201. Raw Materials 3-0-3.

Prerequisite: None. Mr. Dickert, Mr. Taylor

Gives students at beginning of Textile course a thorough survey of natural and synthetic fibers used in the Textile Industry. Covers cotton, wool, synthetics, silk, jute, hemp, flax, kapok, asbestos and miscellaneous fibers.

Text: *None.*

Tex. 204, 205, 206. Principles of Fiber Processing 3-3-4.

Prerequisite: None. Mr. Hill and Mr. Lathem

Gives students a thorough survey course in yarn manufacturing, covering theory, calculations and laboratory practice from the opening room through spinning, winding and twisting. Course covers processing of natural and synthetic fibers on cotton system.

Texts: Willis, *Cotton Opening, Cleaning and Picking; Drawing Frames, Roving Frames; Cotton Spinning,* I.T.C.-*Ga. Tech. Vol. 4.*

Tex. 207, 208. Yarn Manufacturing 3-3-4.

Prerequisite: None. Mr. Hill and Mr. Lathem

Gives students a thorough fundamental course in yarn manufacturing, covering the process from opening room through drawing on natural and synthetic fibers.

Texts: I.T.C.-*Ga. Tech. Vol. I and Vol. II.*

Tex. 223, 224. Weaving 3-3-4.

Prerequisite: None. Mr. Fletcher and Mr. Willis

Courses cover theory and practice of weaving with Cam, Dobby, and Box Looms. A detailed study is made of loom mechanism, nomenclature, and automatic attachments.

Texts: I.T.C.-*Ga. Tech. Vol. 5 and Vol. 6*

Tex. 225. Weaving 3-0-3.

Prerequisite: Tex. 224. Mr. Fletcher and Mr. Willis.

This course is a continuation of T.E. 224 covering a study of some of the more complex automatic loom attachments. A study is also made of sizing materials and their application to natural, synthetic and blended yarns. It also covers cloth room machinery and dry finishing operations.

Texts: I.T.C.-*Ga. Tech. Vol. 7.*

Tex. 306, 307, 308. Yarn Manufacturing 3-3-4.

Prerequisite: Tex. 208. Mr. Hill and Mr. Lathem

A continuation of Tex. 207, 208 covering roving, spinning, twisting and winding, and going into further detail of machine construction, theory of processing and methods of process control. Covers practical machine operation and textile calculation on both conventional and long draft equipment.

Texts: I.T.C.-*Ga. Tech. Vol. 3 and Vol. 4.* Parker: *Cotton Mill Machinery Calculations, Vols. 1 and 2.*

Tex. 309. Elementary Fabric Design 2-3-3.
Prerequisite: None. Mr. McCarty, Mr. Willis
Course covers a study of the fundamental weaves; their structures, properties and applications to various types of fabrics. The laboratory work involves the weaving of fabrics on hand looms from design executed in class.
Text: I.T.C.-*Ga. Tech. Vol. 8.*

Tex. 311. Intermediate Design 3-0-3.
Prerequisite: Tex. 309. Mr. Fletcher, Mr. McCarty
Covers the design of more complex dobby woven fabrics, including honeycombs, brighton, diamond, huck, shaded weaves, and the several standard methods used for deriving new weaves.
Text: I.T.C.-*Ga. Tech. Vol. 8.*

Tex. 312. Fancy Design 3-0-3.
Prerequisite: Tex. 311. Mr. Fletcher, Mr. McCarty
A course covering the design of fancy and complex dobby woven fabrics including backed weaves, figured weaves, double and multiple cloths, pique, pile fabrics and lenos.
Text: I.T.C.-*Ga. Tech. Vol. 8.*

Tex. 313. Fabric Design 3-0-3.
Prerequisite: Tex. 309. Mr. Fletcher, Mr. McCarty
A continuation of Tex. 309 to give students of the Engineering Program and Chemistry and Dyeing Option additional basic training in design.
Text: I.T.C.-*Ga. Tech. Vol. 8.*

Tex. 314. Fabric Analysis 2-3-3.
Prerequisite: Tex. 312 or Tex. 313. Mr. Fletcher, Mr. McCarty
Course covers a study of yarn and cloth calculations and fabric analysis.
Text: I.T.C.-*Ga. Tech. Vol. 8.*

Tex. 332. Basic Circular Knitting 1-3-2.
Prerequisite: None. Mr. Efland
Covers theory and practice of basic circular knitting; Jersey and rib mechanisms, spring and latch needles, sinkers and take-up motions.
Text: MacDonald, *Elementary Circular Knitting.*

Tex. 333. Basic Warp Knitting 1-3-2.
Prerequisite: Tex. 332. Mr. Efland
Covers theory and practice of basic warp knitting with emphasis on Tricot machine.
Text: MacDonald, *Survey of Tricot Possibilities.*

Tex. 360. Plain Circular Knitting 3-3-4.
Prerequisite: Permission of Instructor. Mr. Efland
Covers theory and practice of making cloth on plain circular knitting machinery; includes tuck, welt, plush, and pile fabrics, color, cost, quality, and quantity.
Text: To be selected.

Tex. 361. Plain Half-Hose Manufacture 3-3-4.

Prerequisite: Permission of Instructor. Mr. Efland

Covers theory and practice of making plain half-hose with emphasis on cost, quality, and quantity. Covers mechanism of loopers, plain half-hose machines, and ribbers.

Text: To be selected.

Tex. 362. Fancy Hosiery Manufacture 3-3-4.

Prerequisite: Tex. 361. Mr. Efland

Covers theory and practice of making fancy seamless hosiery of simplier types with emphasis on pattern, cost, quality, and quantity. Covers simplier types of pattern mechanisms, also pre-boarding and boarding.

Text: *None.*

Tex. 401. Cotton Classing 0-3-1.

Prerequisite: Senior standing. Mr. Hill

A course designed to teach the student the fundamental principles of Cotton Classing, according to accepted Governmental standards and commercial practice. Government standards for both Grade and Staple are used as reference.

Text: U.S. Dept. of Agriculture, *Publication No. 310, The Classification of Cotton.*

Tex. 420. Standard Fabrics 3-0-3.

Prerequisite: Senior standing. Mr. Fletcher, Mr. McCarty

Course acquaints the student with the staple and fancy fabrics of the Textile Industry and covers those made from natural and synthetic fibers. It covers the description, construction, finishes, properties, uses, etc.

Text: *None.*

Tex. 422. Jacquard Design and Weaving 2-3-3.

Prerequisites: Tex. 225 and Tex. 312. Mr. Fletcher, Mr. McCarty

Course offered to students in the Textile Manufacturing Option and covers the theory and practice of jacquard design and weaving.

Text: *None.*

Tex. 428. Synthetic Fibers 2-0-2.

Prerequisites: Senior standing and Tex. 206 or Tex. 307.
Mr. Dickert, Mr. Taylor

Course is designed to give student necessary background for handling synthetic fibers. Covers the Chemistry of the manufacturing of synthetic fibers by all major processes. It covers silk system of processing.

Text: *None.*

Tex. 429. Synthetic Fibers 2-0-2.

Prerequisite: Tex. 428. Mr. Dickert

A continuation of Tex. 428 and covers a complete survey of textile processes for handling synthetic fibers. This involves all major processes including the cotton, wool, worsted systems.

Text: *None.*

Tex. 431. Physical Textile Testing 1-3-2.

Prerequisite: Senior standing. Mr. McCarty

A course covering methods and techniques of testing fibers, yarns and fabrics made from natural and synthetic fibers. Standard A.S.T.M. methods and practices of testing are followed as well as a study of the various machines and apparatus employed in standard testing laboratories.

Texts: Haven, *"Industrial Fabrics Handbook"; A.S.T.M., Standards for Textile Testing.*

Tex. 432. Physical Textile Testing 1-3-2.

Prerequisite: Tex. 431. Mr. McCarty, Mr. Postman

A continuation of Tex. 431 designed to give students a broader scope in Testing. The course includes studies of moisture regain and its effect on the properties of both natural and synthetic fibers. Emphasis is placed on synthetic fibers, yarns and fabrics.

Text: Heyn, *Textile Microscopy.*

Tex. 437. Chemical Textile Testing 2-3-3.

Prerequisites: Tex. 431 and Tex. 444. Mr. Taylor, Mr. Postman

Course designed to familiarize students with chemical and microscopic methods of identifying and investigating natural and synthetic fibers. Also covers size and finish analysis in addition to specialized chemical analysis.

Text: Skinkle, *Textile Testing.*

Tex. 443. Bleaching and Dyeing 3-3-4.

Prerequisite: Senior standing. Mr. Taylor, Mr. Postman

A general course covering basic methods of bleaching and dyeing. Covers theory and practice.

Text: Hartsuch, *Introduction to Textile Chemistry.*

Tex. 444. Dyeing and Finishing of Natural Fibers 3-3-4.

Prerequisite: Tex. 443. Mr. Taylor, Mr. Postman

A continuation of Tex. 443 going more into the technique of handling fabrics from natural fibers. Covers dye selection, finishing procedure, etc.

Text: Whittaker and Wilcock, *Dyeing with Coal Tar Dyestuffs.*

Tex. 446. Dyeing and Finishing Synthetics 3-3-4.

Prerequisite: Tex. 444. Mr. Taylor, Mr. Postman

Course covers technique of handling fabrics made from synthetic fibers. It covers the handling of fabrics, dye selection, finishing procedures, etc.

Text: Whittaker and Wilcock, *Dyeing with Coal Tar Dyestuffs.*

Tex. 447. Textile Costing 3-0-3.

Prerequisites: Tex. 225 and Tex. 308 or Tex. 450.
Mr. McCarty, Mr. Hill

Covers basic principles, material, labor, overhead, departmentalizing, accumulating costs by departments, allocation of costs, predetermined costs, fabric cost sheet, marketing costs and financial statements.

Text: Lockwood and Maxwell, *Textile Costing.*

Tex. 449. Textile Costing 3-0-3.

Prerequisite: Tex. 447. Mr. McCarty, Mr. Lathem

This is a more advanced course designed to give the Manufacturing Option student additional work with reference to costs in Textile Mills.

Texts: Willis, *Typical Cost System for Grey Goods Mill;* Willis, *Student Work Book.*

Tex. 450. Textile Machine Calculations 3-0-3.

Prerequisite: Tex. 206. Mr. Hill, Mr. Lathem

Supplies the Textile Engineering student with a concentrated course of calculations dealing with machine operations, process control and mill organization.

Text: Parker, *Cotton Mill Machinery Calculations, Vols. 1 and 2.*

Tex. 451. Mill Engineering 3-0-3.

Prerequisites: Tex. 308 for Manufacturing Option; Tex. 450 for Textile Engineering Program. Mr. Hill and Mr. Dickert

Course includes problems of mill organization, equipment and layout of machinery, equipment cost, problems of conversion when changing machinery to manufacture a different product, etc.

Text: *None.*

Tex. 454. Seminar 1-0-1.

Prerequisite: Senior standing. Mr. Taylor, Mr. Postman

Course designed to teach students use of technical literature and to develop poise in presenting problems to a group of men. Students get training in conducting discussions of current textile problems.

Text: *None.*

Tex. 460. Finishing and Printing 3-0-3.

Prerequisite: Tex. 444. Mr. Taylor, Mr. Postman

A survey course in printing and finishing fabrics from natural and synthetic fibers. Covers methods of printing, equipment used and the fundamentals of preparing printing pastes, etc. Involves theory and practice.

Text: Jacobs, *Textile Printing.*

Tex. 461. Chemical Treatments for Textiles 3-0-3.

Prerequisite: Tex. 444. Mr. Taylor, Mr. Postman

Course covers chemistry of specialized finishing treatments for textiles.

Text: *None.*

GRADUATE COURSES OFFERED

Tex.	626-27	Advanced Dyeing	3-3-4
Tex.	628	Natural and Synthetic High Polymers	3-0-3
Tex.	646	Advanced Fabric Analysis	3-3-4
Tex.	648	Advanced Design	3-0-3
Tex.	656-57	Advanced Yarn Manufacture	2-3-3
Tex.	666-67	Advanced Weaving	2-3-3
Tex.	673-74	Technical Textile Testing	2-3-3
Tex.	700	Master's Thesis	
Tex.	701-2-3	Seminar	1-0-0

(Complete details about these courses are contained in the **Graduate Bulletin**, a copy of which is available upon request.)

THE CO-OPERATIVE DIVISION

(Established in 1912)

Co-operative Courses in Aeronautical, Chemical, Civil, Electrical, Industrial, Mechanical, and Textile Engineering

(A Special Bulletin is available and will be mailed on request)

The engineering graduate must have an educational background of sound scientific and economic principles, and he must be acquainted with industrial practices in his field of employment before he can assume responsibility for industrial projects. The interlocking of theory and practice is provided in the co-operative plan of engineering education by the integration of technical theory and practical industrial experience. The Georgia Institute of Technology recognizes the value of this plan and has since 1912 offered a Co-operative Course for those students who desire to acquire their education under the co-operative plan. The correlation of the scientific and engineering practices of classroom and laboratory work and practical industrial experience is accomplished in a five-year course, during which the student works for an industrial company approximately ninety-six weeks.

Seven engineering courses are available to students under this plan. Originally only Mechanical and Electrical Engineering were offered, but Civil, Textile, and Chemical Engineering were added between 1920 and 1928, and in 1946 Aeronautical and Industrial Engineering were included.

Students in the Co-operative Division are selected from men who are in the upper third of their high school or preparatory class, or who have made better-than-average records in the Georgia Tech regular course or some other accredited college. An applicant must be a graduate of an accredited secondary school and must be specifically recommended by its principal. The entrance requirements for the Co-operative Courses include all "Specified or Required Units" on page 49. Only those students who expect to graduate under the Co-operative Division are accepted for these courses. A co-operative student, of course, must make a creditable scholastic record before being recommended for work in industry, and is allowed to continue under the co-operative plan only if he maintains a good record. Upon graduation a Bachelor's Degree, Co-operative Plan, is awarded to a co-operative student in his particular field of engineering.

Students in the Co-operative Division are divided into two sections, the first beginning classes in June and the second in September. While section one is at college three months, section two is at work in industry for the same length of time. The two sections alternate or exchange places with each other every three months until the fifth year, when they merge and remain at college continuously until graduation. A co-operative student gets three weeks' vacation during each calendar year—one week at Christmas and two weeks during the summer.

The Institute is co-operating with more than two hundred and fifty firms, including power companies, electric and electronic equipment manufacturers, gas companies, railroads, manufacturers of machinery and mechanical equipment, pulp and paper mills, chemical industries, textile mills,

foundries, steel mills, construction and engineering firms, and state and governmental agencies. The area covered by these industries includes the Southeastern States and many sections of the Middle Atlantic and Western Central States.

After satisfactory completion of at least three months' classroom work in the Co-operative Division, a student is recommended for work with an industrial company. Since the firms employing co-operative students offer a wide variety of practical training and many lines of specialization, students are afforded the opportunity to secure work in the field in which they are most interested. Although the Co-operative Division does not guarantee work nor stipulate any certain amount of compensation, every effort is made to place students to their best educational and financial advantage.

The co-operative students receive wages for their work at the prevailing rate in the shops in which they are employed, and the employers pay the wages directly to the students. At the present time the average beginning wage for a freshman is around $200.00 per month. The wages increase as the student progresses in his industrial and classroom work. A student remains on the job assigned him until he is advanced to a higher grade of work by the company which employs him or by the Co-operative Division. By the time he graduates, a co-operative student will have received training in practically all departments of an industry. A high percentage of students trained in this way follow and succeed in their chosen profession. At the conclusion of the course the co-operative graduate is not obligated to accept employment with the co-operating company; neither is the company obligated to offer employment. In many instances, however, such employment is offered by the company and accepted by the student.

The Director of the Co-operative Division makes frequent visits to employing companies. Through interviews with company officials and shop foremen he brings about co-ordination of industrial work with engineering curricula and takes care of any adjustments in types of work, wages, and other relevant matters. Before freshmen are sent to work, they attend orientation classes in which they are acquainted with the various aspects of their industrial work and receive pointers on how to succeed on the job, how to make friends with regular shop employees, how to save wisely, and other important factors.

A Georgia freshman should have about $750.00 and an out-of-state student about $850.00 for the total expenses of his first two academic quarters. Anyone interested in making application for admission into the Co-operative Division should write to J. G. Wohlford, Director of the Co-operative Division, for a bulletin which gives full particulars about fees, courses, living expenses, wages paid the students while at work, discipline, school activities, and other pertinent information.

THE 3-2 PLAN OF ENGINEERING EDUCATION

With more and more engineers occupying positions of leadership in the business, manufacturing, and governmental fields, there has developed a need for a plan of engineering education that will provide more courses in liberal arts, physical sciences, and mathematics than is possible under the regular engineering curriculum. Recognizing this need, the Georgia Institute of Technology in 1954 arranged a combined plan with a limited number of outstanding liberal arts colleges in the South to offer to qualified prospective engineers a more complete and well-rounded form of training for the world of today and tomorrow.

Under this plan the student may attend one of these liberal arts colleges for three years and then one of the eight engineering schools of the Georgia Institute of Technology for two years. Upon satisfactory completion of his two years at the school of engineering, he is eligible for the appropriate bachelor's degree from his original college and the bachelor of engineering in his particular field from the Georgia Institute of Technology.

Colleges and universities associated with the Georgia Institute of Technology in offering the 3-2 Plan of Engineering Education include:

THE UNIVERSITY OF THE SOUTH

Sewanee, Tennessee

The University of the South, founded in 1856 and popularly called Sewanee, is a small institution, with an enrollment of approximately 600 men students. Sewanee is under the jurisdiction of 22 dioceses of the Protestant Episcopal Church in the Southeast, but it welcomes men of all faiths. For further information, including admission requirements, write to Director of Admissions, The University of the South, Sewanee, Tenn.

DAVIDSON COLLEGE

Davidson, North Carolina

Davidson College, founded in 1837 by Presbyterians, is a liberal arts college with an enrollment of about 800. It is a church-related college without being narrowly sectarian. Since enrollment is limited, an applicant should request necessary information and forms from the Director of Admissions as early as possible.

UNIVERSITY OF CHATTANOOGA

Chattanooga, Tennessee

The University of Chattanooga is a privately controlled and endowed university for men and women. A successor to two older institutions founded in 1866 and 1886, it today through its various colleges and divisions has an enrollment of almost 2,000. For further information, write to Dean of Admissions, Scholarships and Guidance.

SOUTHWESTERN AT MEMPHIS

Memphis, Tennessee

Southwestern at Memphis, with an enrollment of about 800, originated in 1848 at Clarksville, Tenn., and in 1900 was relocated in Memphis. Identified with the Presbyterian Church for almost a hundred years, it provides a Christian liberal education program. Complete information is available from the Registrar.

THE GRADUATE DIVISION

(A Bulletin on Graduate Studies will be sent upon request)

Administrative Officers

Ray L. Sweigert, B.S. in M.E., M.A., Ph.D.....*Dean*

Graduate Council

Ray L. Sweigert, Ph.D.....*Chairman*
William L. Carmichael, M.S.....*Secretary*

Ex-Officio

Paul Weber, Ph.D.....*Dean of Faculties*
Jesse W. Mason, Ph.D.....*Dean of the Engineering College*
Ralph A. Hefner, Ph.D.....*Dean of the General College*
Paul K. Calaway, Ph.D.....*Acting Director, Engineering Experiment Station*
Mrs. J. H. Crosland.....*Librarian*

Appointment Expiring June 30, 1956:

Andrew J. Walker, Ph.D., *Professor of English*
Charles H. Braden, Ph.D., *Associate Professor of Physics*
James L. Taylor, Ph.D., *Professor of Textile Engineering*

Appointment Expiring June 30, 1957:

Benjamin J. Dasher, D.Sc., *Professor of Electrical Engineering*
Joseph H. DallaValle, D.Sc., *Professor of Chemical Engineering*
Mario J. Goglia, Ph.D., *Professor of Mechanical Engineering*

Appointment Expiring June 30, 1958:

Howard K. Menhinick, M.L.A.C.P., *Regents Professor of City Planning*
James W. Sweeney, Ph.D., *Assistant Professor of Industrial Management*
Robert E. Stiemke, M.S. in C.E., *Director, School of Civil Engineering*

Appointment Expiring June 30, 1959:

William H. Eberhardt, Ph.D., *Associate Professor of Chemistry*
W. Dale Jones, Dr.Eng.Sc., *Associate Professor of Industrial Engineering*
Marvin B. Sledd, Ph.D., *Associate Professor of Mathematics*

Purpose

The Graduate Division offers an opportunity to obtain that background of specialization, professional study, research, and independent work toward an individual objective that the increasing complexity of the engineering, scientific fields, and management fields has made so highly desirable.

Degrees and Fields of Study

The degree of *Master of Science* is offered with or without designation in the following fields: Aeronautical Engineering, Applied Mathematics, Ceramic Engineering, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, Engineering Mechanics, Industrial Engineering, Industrial Management, Mechanical Engineering, Physics, Public Health Engineering, Safety Engineering, Sanitary Engineering, and Textile Engineering. It may be awarded without designation when the student does not major in the field in which he has earned his bachelor's degree. The degrees of *Master of Architecture* and *Master of City Planning* are also offered.

The degree of *Doctor of Philosophy* is offered in Chemical Engineering, Chemistry, Electrical Engineering, and Physics.

In addition to the fields of study listed above for the *Master of Science* degree, collateral study of an advanced nature is available in Industrial Psychology, Modern Languages and Sociology.

Fellowships are being supported at the Georgia Institute of Technology

BY

The Virginia Electric and Power Company, the Duke Power Company, the Georgia Power and Light Company with the Florida Power Corporation, Southern Services, Inc. (Alabama Power Company, Georgia Power Company, Gulf Power Company, and Mississippi Power Company), Florida Power and Light Company and the Mississippi Power and Light Company.

The Shell Oil Company
Graduate Study and Research in Chemical Engineering

Eastman Kodak Corporation
Graduate Study and Research in Chemical Engineering

The Texas Company
Graduate Study and Research in Textile Lubrication

The T. E. Stribling Foundation
Graduate Study and Research in Textile Engineering

The Celanese Corporation
Graduate Study in Textiles and Textile Engineering

The Research Corporation
Graduate Study and Research in Chemistry

The Socony-Vacuum Oil Company
Graduate Study and Research in Chemical Engineering

The Gulf Oil Company
Graduate Study and Research in Mechanical Engineering

L. W. ROBERT & COMPANY
Graduate Study in Architecture

THE RAYONIER CORPORATION
Graduate Study and Research in Chemistry or Chemical Engineering

DELTA AIR LINES INC.
Graduate Study and Research in Aeronautical Engineering

SOUTHERN AIRWAYS
Graduate Study and Research in Aeronautical Engineering

THE DOW-CORNING CORPORATION
Graduate Study in Textiles and Textile Engineering

THE HUMBLE OIL COMPANY
Graduate Study in Chemical Engineering

THE PHILLIPS PETROLEUM CORPORATION
Graduate Study in Chemical Engineering

LORIDANS FOUNDATION
Graduate study and research for a graduate student from Tourcoing, France

J. C. NICHOLS FOUNDATION
Graduate study and research in City Planning

MARY WHITE STATON FELLOWSHIP
Graduate study and research for a graduate student from Colombia, South America

WESTINGHOUSE EDUCATIONAL FOUNDATION
Graduate study and research in Electrical Engineering

For further information concerning any of the above fellowships, write the Dean of the Graduate Division.

DIVISIONAL FELLOWSHIPS

Graduate Research Fellowships may be made available from the funds of the Graduate Division to enable worthy students to continue with advanced study and research in an engineering or scientific field.

INSTRUCTORS AND ASSISTANTS

Instructorships on a part-time basis may be granted to graduate students qualified to teach at college level. These positions do not carry faculty rank. Stipends will be based on the proportionate teaching load and the qualifications of the individuals. They will in general range from $1000.00 up.

Assistantships—Graduate and research assistants are available for graduate students possessing experience and ability applicable to current or planned

research, or qualified to serve as assistants to instructors or in laboratories. Stipends range from $1000.00 per academic year upward depending on the amount of service required.

Admission

In general, applicants for admission to graduate study should hold a bachelor's degree from a recognized university, school, or college and should have graduated with academic standing in the upper half of their class. Those applicants who plan to become candidates for the doctorate should have had academic standing in the upper quarter of their baccalaureate class or must have demonstrated, or be prepared to demonstrate, outstanding ability in their work toward a master's degree.

Length of Study and Graduate Requirements

Thirty-six quarter hours of advanced study past the bachelor's degree plus a thesis, or fifty quarter hours of advanced study past the bachelor's degree without a thesis are necessary in fulfillment of the requirements for the master's degree. At least one full academic year in residence past the bachelor's degree must be completed on campus before the master's degree can be awarded.

At least three full academic years of advanced study and research past the bachelor's degree are necessary for the award of the doctorate. Ordinarily between 67 and 90 quarter hours of advanced work in course will be undertaken, the balance of the required time being devoted to research and the preparation of the dissertion. At least three full quarters of the doctorate program must be spent in residence at the Georgia Institute of Technology and unless special permission is obtained, these must be the three immediately preceding the award of the degree.

Graduate Bulletin

A copy of the Graduate Bulletin, discussing requirements for advanced degrees in detail and listing advanced work in course available in the various departments, may be obtained on request from the Dean of the Graduate Division.

RESEARCH BUILDING

West Stands—Grant Field

ENGINEERING EXPERIMENT STATION

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James E. Boyd, Ph.D. ..... *Assistant Director (Research)*
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*On leave

James T. McCullough, D. M. Martin, Elizabeth Newbury, M. E. Rucker, W. L. Simpson, C. M. Smith, J. E. Smith, W. R. Stephens, H. W. Strickland, D. B. Swafford, H. R. Waldrup, Pat Walters, S. E. Whelchel.

ACCOUNTANT—Toney Bryant; ADMINISTRATIVE ASSISTANT—W. C. Jackson, Jr.; SENIOR CLERK—Marcelle Simpson; ACCOUNTING CLERK—Jean Gary; SECURITY OFFICER—R. C. Williams; MACHINE OPERATOR—Carolyn Dvorscak; RECEPTIONIST—Rose Marie Glover; RECORDS CLERK—Carrie A. Sorrells; REPORT TYPIST—Agnes Brown; SECRETARIES—Barbara Beall, Mary Bradley, Lynn Bacon, Maxine Chambers, Adele L. Champaign, Isabell Herzberg, Louise Hitch, Anna Kennedy, Sue McDougall, Mary Mourfield, Mary Ogden, Marjean Patterson, Wanda Reeves, Avis Rhoades, Ann Robinson, Sara Robison, Martha Shoemaker, Audrey Tanner; CLERK-TYPISTS—Mary Banks, Mary Geer, Marguerite Volk, Ann O'Connell.

PURPOSES

The Georgia Tech Engineering Experiment Station is the agency of the University System of Georgia which is designed to enhance the general welfare of the people of Georgia by coordinating and conducting investigations in all fields of engineering and in many aspects of the physical and chemical sciences. The station is charged with: the promotion of research in the Georgia Institute of Technology, the development of a program of assistance to industry and agriculture, and the study and utilization of the natural resources of the state.

Georgia Tech believes that a progressive engineering school should carry on, conjointly, a strong educational program and a coordinated fundamental and applied research program. Teaching and research are complementary. At Georgia Tech one finds that philosophy carried out by a full time Engineering Experiment Station staff comprised of competent scientists and technicians, a large number of associated faculty members and a strong supporting graduate school.

During the year 1953-1954 the Station utilized, including 40 graduate and 70 undergraduate students, the full time services of 275 persons and part time services of 155 persons in the prosecution of 86 major and 58 minor research problems.

Many activities of great potential value to the State are now under way. Some of them are: a study of the chemical and physical structure of Georgia clays; a survey of the research needs of the naval stores industry; industrial applications of radioactivity; nuclear spectrometry and instrumentation; new techniques in phase microscopy; the application of microwave techniques to chemical analysis; new methods of electrical network analysis; the chemical composition of ground waters in Georgia; television projects; fuel-injection systems for gasoline engines; a survey of the research needs of some of the larger aspects of the total research needs of Georgia industry.

The results of investigations are made available to the public by publication in technical periodicals, in the bulletins, circulars, reprints, and special reports of the Station, and the Station's quarterly journal, *The Research Engineer*.

This year the Station's budget is almost $2,000,000. In both facilities and finances, it is one of the largest state engineering experiment laboratories in the nation. The principal sources of this support are: the United States Government, by means of research grants channelled through the Georgia Tech Research Institute; private industry (mostly in Georgia), through contracts for specific research projects; the State of Georgia, by means of appropriations through the Board of Regents; and gifts, grants-in-aid, and endowments.

Advanced and graduate students are employed on projects in the Engineering Experiment Station whenever feasible, to afford them direct experience and training in research and development work.

Each year a number of Research Graduate Assistantships or Fellowships are awarded. These positions carry stipends of a minimum of $1,000 per year of part-time work and are open on a competitive basis to qualified graduates of accredited institutions. For information concerning academic requirements for advanced degrees applicants are requested to refer to the section of the catalog on the Division of Graduate Studies.

THE ENGINEERING EXTENSION DIVISION

The Engineering Extension Division is designed both as a campus and an off-campus educational program to serve the people and industry of Georgia where a need exists for industrial training. The scope of its work includes college credit courses as well as specialized programs in adult education such as vocational courses, terminal courses designed to train those who wish to qualify as engineering aides and technicians, short courses and conferences, and in cooperation with the State Department of Education, a training program in trade and industrial education within the industries and public services of the state, including supervisory and foremanship conferences.

ENGINEERING EVENING SCHOOL

The Engineering Evening School was organized at Georgia Tech in 1908 to meet the demand for more technical knowledge by those who were compelled to work during the day. It was designed to meet the needs of those who found that the education they possessed was not enough to insure advancement in their chosen work; for those who desired instruction along new lines in order that they might change occupations; and for those who wished to specialize along some practical line.

Tuition and Fees

The fees of the various Evening School courses are dependent upon the number of hours scheduled per week per quarter.

Part-Time Schedules

Less than 12 equivalent quarter hours per week per quarter.

	Matriculation Fee per Scheduled Hour per week per quarter		Non-Resident Tuition Fee per Scheduled Hour per week per quarter	
	Recitation	Laboratory	Recitation	Laboratory
Residents of Georgia	$5.00	$4.00	....	....
Non-Residents of Georgia	$5.00	$4.00	$5.00	$4.00

Full-Time Schedules

12 or more equivalent quarter hours per week per quarter.

	Matriculation Fee per Quarter	Tuition Fee per Quarter	Medical Fee per Quarter	Total Fees per Quarter
Residents of Georgia	$60.00	.....	$8.00	$ 68.00
Non-Residents of Georgia	$60.00	$128.00	$8.00	$196.00

Proper papers from the Veterans Administration will be accepted for college credit subjects and for laboratory type adult education subjects.

A bulletin giving description of Evening School courses in detail will be sent upon request.

College Credit Subjects

College credit subjects are offered by the Engineering Evening School through the cooperation of the various schools and departments of the Georgia Institution of Technology. Evening School classes are taught with the same high standards that are maintained in the day school and, in most instances, are taught by regular day school faculty members.

Most of the subjects in the freshman and sophomore years and some junior and senior subjects are offered each quarter. Other subjects will be made available in the evening classes when they are requested by a sufficient number of students.

TECHNICAL INSTITUTE TRAINING

These courses prepare students for many technical positions in the field of engineering but are not presented as a substitute for a four-year professional engineering course.

Many professional engineering graduates accept technical positions which could be successfully filled by a graduate from a reputable technical institute.

Technical Institute courses are briefer and more completely technical than professional engineering courses.

Graduates from Technical Institute courses are in great demand. Starting salaries of graduates are nearly equal to the starting salaries of professional engineering graduates. Technical Institute graduates with several years of industrial experience in many instances hold positions equal or nearly equal to positions held by professional engineering graduates who have similar industrial experience.

Technical Institute training is available at Georgia Tech on either a full-time or a part-time schedule.

A full-time day program is available at Southern Technical Institute at Chamblee, Georgia. Two academic years or six quarters are required to complete the various courses at Southern Technical Institute. For more complete information regarding this school write for special catalog.

On a part-time schedule this training is available in the Engineering Evening School on the Georgia Tech campus. Approximately four years are required through part-time schedules to qualify for the Associate in Science degree as a "Technician" or "Engineering Aide." Those who work in Atlanta's metropolitan area may thus avail themselves of the opportunity of obtaining this type of training through evening study.

Students who wish may take part of their training in the Engineering Evening School on the main campus and later transfer their credits to Southern Technical Institute to complete their course, or vice versa.

Pre-freshman Subjects

Remedial and refresher subjects are offered under the administration of the Engineering Evening School for the following purposes:

1. To provide an opportunity for fulfilling entrance requirements.

2. To provide a college adjustment opportunity.
3. To serve as a proving ground for students dubious of their aptitudes for engineering.

Subjects offered include Remedial English, Review Course in Algebra, Practical Plane Geometry, and Elementary Physics.

Adult Education Subjects

Special subjects in the field of adult education are offered by the Engineering Evening School each quarter. These subjects do not carry college credit but are designed as an up-grading program to serve the needs of people interested in additional training in the various technological fields.

Many subjects including air conditioning, architectural drawing and design, gemology, illumination, machine shop, photography, public health, radio and various industrial engineering subjects are being offered. Adult education classes in technical or related subjects will be organized whenever sufficient demand is indicated.

TRADE AND INDUSTRIAL EDUCATION

In conformity with the provisions of the Smith-Hughes Act, this department, in cooperation with the State Department of Education, has the responsibility of training trade and related industrial teachers for the following types of schools and classes in the State of Georgia:

1. Evening classes in public schools and industrial plants.
2. All day public trade schools.
3. Public and plant part-time schools.
4. Foremanship courses.

The activities of the department include research to determine specific industrial education needs of a community, industry or plant, developing courses of study to meet these needs; selection of teachers of the required industrial experience; training these teachers for specialized service; the development of specialized instructional materials for use of such teachers; the training of local teacher trainers in the larger industrial centers; and the improvement of teachers in service after placement.

Because of the specialized local character of this extension work all activities are conducted under special arrangements between the Georgia Institute of Technology, the Georgia State Board of Education, local boards of education, and industrial plants. The following courses and other activities are conducted at many localities in the state; history of education, principles of industrial education, organization of trade education, organization of part-time education, foremanship conference, vocational guidance, training industrial teachers in service, journal reading, methods of teaching, methods of shop demonstration, organization of manual training, educational psychology, industrial psychology, business psychology, course planning, lesson planning, practice teaching, industrial plant surveys, shop organization, general school organization, teaching related subjects, training industrial teachers in service, and trade analysis.

SHORT COURSES AND CONFERENCES

Through this department of the Engineering Extension Division special technical and industry-management short courses and conferences are planned and conducted for the benefit of industries in Georgia and the Southeast. This phase of extension service helps to train key industry personnel by providing information and instruction on new developments and best methods.

The department of Short Courses and Conferences works in close cooperation with industry, trade associations, technical, and scientific and business organizations in planning and presenting these special educational programs.

Through the cooperation of the various schools and departments of the Georgia Institute of Technology, the Engineering Extension Division has access to the various school facilities for the classroom and laboratory work of these short courses. Skilled and experienced teaching personnel along with specialists from industry are secured to provide the best in instruction.

Inquiries concerning these services are welcomed.

SOUTHERN TECHNICAL INSTITUTE

Chamblee, Georgia

Director—Lawrence V. Johnson; *Registrar*—Loy Y. Bryant; *Deans*—George L. Carroll, George L. Crawford, Cyrus V. Maddox; *Associate Professors*—C. A. Arntson, John C. Clark, Earle A. Clifford, Jesse J. Defore, W. R. Halstead, Charles T. Holladay, Hoyt L. McClure, E. J. Muller, C. R. Orvold, L. H. Taylor, Wilton W. Vaughn, R. L. Wilkinson; *Assistant Professors*—M. E. Blair, R. C. Carter, C. R. Freeman, R. W. Hays, J. E. Lockwood, D. I. McCool, A. L. Steinkamp; *Instructors*—R. A. Burgkart, B. B. Herms, Kermit Hutcheson, Clark Lambert, R. L. Myatt, W. O. Spaeth, T. M. Sullivan, J. W. Tootle, Ralph Youngblood; *Special Lecturers*—Clebourne Duke, R. N. Edwards, J. P. Goodwin.

General Objectives

Southern Technical Institute is a unit of the Engineering Extension Division of the Georgia Institute of Technology, designed for the student who is not particularly interested in the theoretical side of engineering as needed for original research and design but is interested in a specialized technical course of applied engineering which qualifies for high-paying technical positions in industry. All courses can be completed in two college years. Southern Technical Institute prepares the student to enter into and advance in the engineering field of his choice. Although as a graduate of a two-year college course, he is not, a full engineer, there is no reason why, by hard work and further study, he cannot advance to top position.

Southern Technical Institute curriculum is designed to provide the basic scientific training, the specialized technical "know-how," and the super-

visory and management training needed by the technician. The courses are briefer, more intensive, and more specific in purpose than those of the professional engineering curricula, although they lie in the same fields of industry and engineering. Their aim is to prepare the individual for specific technical positions or lines of activity rather than for broad sectors of engineering practice.

Entrance Requirements

An applicant may be admitted by a certificate under the following conditions:

(a) He must have graduated from an accredited high school with a record high enough to indicate preparation for institute work, or have an equivalent training in practical experience.

(b) He must be at least 16 years of age.

Veterans' Program

Veterans are eligible to enter the Institute under the G.I. Bill of Rights, as established under Public Laws 16, 346, and 550.

Tuition and Fees

The rates for fees, board and room are subject to change at the end of any quarter.

	Matriculation Fee per Quarter	Tuition Fee per Quarter	Medical Fee per Quarter	Student Activity Fee per Quarter	Total Fees Per Quarter	Total Fees Per Academic Year
Residents of Georgia	$81.50	.....	$3.50	$5.00	$ 90.00	$270.00
Non-Residents of Georgia	$81.50	$95.00	$3.50	$5.00	$185.00	$555.00

Courses of Study

Courses are offered in Building Construction, Electrical, Electronic and Radio, Mechanical, Heating and Air Conditioning, Industrial, Civil, and Gas Fuel Technologies.

The job opportunities for technicians are numerous. Studies made by the American Society of Engineering Education reveal that five technicians are needed for every engineer. The Associated Industries of Georgia estimates that there are, in Georgia alone, 20,000 well-paying positions for trained technicians, at salaries ranging upward from $3,600 per year.

The work offered qualifies for five major occupational fields:

(1) Draftsman, (2) Maintenance and Operation, (3) Production, (4) General Construction, (5) Sales and Contracting.

A special bulletin containing complete information will be sent upon request to Registrar, Southern Tech, Chamblee, Ga.

HEALTH SERVICE

The Joseph Brown Whitehead Memorial Infirmary having a normal capacity of thirty beds also houses the physicians offices, examining and treatment rooms, reception room, the clinical, x-ray, and physiotherapy laboratories and the diet kitchen.

The Infirmary staff, headed by the Director of Health, consists of a visiting consultant, an associate physician, and an able consulting staff, two internes, four full time registered nurses, x-ray and physiotherapy technicians, laboratory technician, secretary, two orderlies, and a maid. The control of the infirmary is vested in a faculty committee composed of the Director of Health, Assistant Athletic Director, Dean of Students, the Executive Dean, and one outside physician.

The facilities of the Infirmary are open to all regular undergraduate day students, graduate students, and co-operative students in school. Free hospitalization is limited to two weeks during each quarter. Instructors, faculty members and school employees are not entitled to free treatment or hospitalization except in case of emergency.

For those eligible, medical service is free of charge for all ordinary diseases or accidents and includes the following: all necessary medical care and necessary minor surgery to outpatients and infirmary patients by the school physicians, emergency dental care arising after matriculation, consultation when advised by the Director of Health, nursing care and the usual routine laboratory examinations.

Free service does not apply to the following: major surgery, elective surgery, specialist's care, orthopedic appliances, special laboratory examinations, special nurses, expensive medications, hospitalization in cases of the more serious contagious diseases, or students who are ill electing to remain outside the infirmary. Nor will the Health Service be responsible for treatment of chronic ailments which were present before matriculation. In these instances the student, parent or guardian is responsible for such added expense.

All students who are ill are expected to report to the infirmary, provided they do not prefer their own physician or another hospital. The Infirmary is open to recognized physicians and consultations are welcomed at all times.

Students are charged fifty cents for each meal served while in the infirmary. A complete physical examination is compulsory for each new student. This requirement will be waived in case of veterans who have been separated from military service within the preceding year, provided they do not elect to take advanced R.O.T.C. Subsequent physical examinations will be required at the discretion of the authorities. The school arranges to have these examinations conducted at a scheduled time shortly after matriculation, by a group of well trained specialists at no additional expense to the student. An additional fee of $7.00 will be charged each student who for any reason fails to take his examination when scheduled. Medical certificates from elsewhere will not be accepted. At the time of his physical examination each student will be responsible for declaring any handicap such as asthma, hay fever, sinus trouble, and flat feet for which he wishes consideration in his physical training program.

The Director of Health as representative of the Institute reserves the right to exclude students for certain infirmities and disabilities.

Examination includes a tuberculin skin test. Students who show a positive reaction are required to cooperate by having X-ray examination of his lungs at the school hospital.

Any student who does not present a certificate or other evidence of successful vaccination within the past four years will be vaccinated at the time of his physical examination.

Prophylactic, typhoid and tetanus innoculations will be given free when such innoculations are requested.

It is expected that, before matriculation, students will have corrected any errors of refraction, and dental or other conditions which, if neglected, may interfere with their curricula activities. Warts should be cared for before matriculation or during vacation. Their removal and subsequent dressing during school is not only time consuming but is also a prolific source of time lost from classes and physical training.

Absences from classes will not be excused after they are missed except upon a written certificate from a private physician that he has attended the student who was unable to attend classes. Exceptions will be made in case of a student living at a distance from the campus who presents a written excuse from his parents.

Students requiring treatment of minor non-emergency ailments shall report to the clinic during periods when they do not have a class, in so far as possible. Excuses will be given only for time actually spent in clinic.

LIBRARY

Director of Libraries—Mrs. J. Henley Crosland; *Associate Director of Libraries*—Dale L. Barker; *Chief of Technical Processes*—Miss Sophia Sullivan; *Head Cataloguer*—Miss Mary Lou Barker; *Cataloguers*—Miss Eleanor Smith, Miss Patricia Baum, Miss Wilma Reynolds, Mrs. Jeanne Magill; *Acquisitions Librarians*—Mrs. Beatrice R. Caine, Sidney S. Thomas; *Documents Librarian*—Miss Dorothy Jones; *Special Collections Librarian*—Miss Safford Harris; *Interlibrary Loan Librarian*—Miss Frances Kaiser; *Science-Technology Librarian*—Miss Tattie Mae Williams; *Assistant Science-Technology Librarian*—Robert N. Smith; *General Studies Librarian*—Arthur N. Corontzes; *Music Librarian*—Mrs. Charles T. Pottinger; *Architecture Librarian*—Miss Natelle Isley; *Secretary to Director of Libraries*—Mrs. Betty Jean Faxas; *Bookkeeper*—Miss Billie Rhoads; *Clerical Assistants*—Miss Elizabeth Albreast, Mrs. Shirley Bowden, Miss Jane Green, Miss Susan Jones, Miss Betty Libbey, Miss Mildred McClain, Miss Patsy Mealor, Mrs. Yvonne Musgrave, Miss Martha Rand, Mrs. Mary Ann Sheppard, Miss Suzanne Thompson, Miss Barbara Walker, and Miss Betty Walker.

On November 21, 1953, the new Price Gilbert Library was dedicated. It is an impressive structure of contemporary design. The cost, including equipment and furniture, was approximately $2,000,000. The building, completely air-conditioned, has five floors on the South wall and three on the North wall. The entire North wall is of glass framed in aluminum; the South wall is equally divided with glass and Roman brick; the East and West walls are brick.

The interior of the building follows the contemporary design of the exterior. Twenty colors have been used throughout the building giving a feeling of warmth. Comfortable lounge furniture has been interspersed between the large natural birch reading tables. All stacks, except those on the ground floor, are open.

The building will house approximately 450,000 volumes and seat 800. An auditorium seating 300 on the ground floor is made possible by throwing the Music and Faculty Lounges together. By a generous gift of an alumnus, the record collection of 2,500 will be doubled. The Music Room is a source of pleasure and enjoyment to students and faculty. The first and second floors are for the General Studies Collection. The third and fourth floors house the Science-Technology Collection.

The Library collection today numbers more than 150,000 items and approximately 100,000 unbound documents and pamphlets. The greater part of these, which are scientific and technical, are used for study and research. The Library subscribes to the journals of the leading engineering and scientific societies and to the outstanding scientific and technical periodicals in this country and abroad. There is an author and title and a subject catalogue for all books and periodicals. Departmental libraries are being moved into the central collection.

The Library is primarily for the use of students and members of the faculty. All books, not reference or held on reserve, may be withdrawn for home use in accordance with the rules of the Library. The General Library is open from 8:00 A.M. to 10:00 P.M. Monday through Thursday. On Friday and Saturday, the building closes at 6:00 P.M. It is open on Sundays from 2:00 P.M. to 6:00 P.M. Printed Library regulations are given the freshmen at the beginning of the school year.

UNIVERSITY CENTER IN GEORGIA

The following institutions are cooperating in a University Center in Georgia:

Agnes Scott College for Women, Decatur, Georgia.
Columbia Theological Seminary, Decatur, Georgia.
Emory University, Emory University, Georgia.
Georgia Institute of Technology, Atlanta, Georgia.
High Museum of Art, Atlanta, Georgia.
University of Georgia, Athens, Georgia.

A union library catalogue of the complete holdings of these institutions has been made. One catalogue is at Emory University and one at the University of Georgia. These are author catalogues. Through telephone service the other institutions may locate a book.

REGULATIONS FOR COOPERATING LIBRARY USE

1. The following groups may use the cooperating libraries:
   a. Faculty members.
   b. Graduate students actually enrolled.
   c. Undergraduate students enrolled in any given quarter and in good standing at the institution issuing the identification.
2. Condition under which the libraries may be used:
   a. Faculty members and students borrowing books for the first time from any library shall be given regulations of the lending library and shall be required to subscribe to the conditions therein.
   b. Faculty members shall observe the same time limit allowed to student borrowers (in any library but their own) and be subjected to similar fines. Exceptional privileges for the use of materials in definite programs of research may be granted at the discretion of librarian of the institution concerned.
3. Identification:
   a. Faculty members upon request will be given cards of introduction. These will be kept on file at the cooperating institutions.
   b. Students upon request will be given identification cards. These must be presented each time a book is requested.

OFFICE OF DEAN OF STUDENTS

The Dean of Students and his associates are interested in the student as an individual. For that reason they attempt to be of service to him in more than just the academic phase of his career at Georgia Tech. Supervision of all campus activities outside of the curriculum is centered in this office. Counseling assistance on personal, vocational, financial, and other problems are provided.

The student has contact with the staff members not only while on the campus but also afterwards when he has taken up his professional career. This office welcomes the new freshman to the Georgia Tech campus and supervises his orientation. It assists in finding part-time work, aids the veteran in his relations with the Veterans Administration, and helps both seniors and alumni in finding positions. The office also supervises the Student Council, the publications, the social fraternities, and other extra-curricular activities. All of these contacts enable the staff members to have frequent association with the students.

A program of student counseling and guidance is conducted by the Office of the Dean of Students. A counseling office has been established. Its functions are the giving of the battery of psychological tests at the time of the student's matriculation, and individual testing and counseling of men with specific problems.

An employment service is maintained by this office for students who need assistance in paying their college expenses. In providing opportunities for part-time work, however, the staff holds firmly to the belief that a student's first concern is his academic work. It has been found that one who must work in order to meet his college expenses should ask for a lighter schedule and allow more than twelve quarters to secure his degree, the average student being unable to carry a full schedule and work more than two hours per day without failure in one or more subjects.

For the benefit of the seniors and graduate students, continuous contact is maintained with industrial concerns throughout the nation. An accurate knowledge of the personnel needs of these industries enables this office to be of great assistance in placing students upon their graduation. Many industries send representatives to the Georgia Tech campus for individual interviews. A similar service is provided for alumni who desire to change positions.

The office of the Dean of Students is always open to any student who is seeking counsel and advice to enable him to derive the most from his life at Tech. The Dean of Students and his staff are eager to cooperate with his parents in an effort to solve any problems affecting the welfare of Georgia Tech men.

STUDENT ACTIVITIES

STUDENT COUNCIL — 1954-1955

The Student Council, which was first established in 1922, is the student government organization. It exercises supervisory authority over all extra-curricular student activities except the Y.M.C.A. and athletics. It serves as the principal liaison agent between the general student body and the school authorities and is the authoritative voice of the students. It promotes understanding and harmony between the students and the faculty. The Student Council controls the use of student activity fees and handles all financial matters involving the general student body. The council is also in charge of all elections of class officers and Student Council members. (In January, 1946, the students used six regular voting machines when electing class officers. It is believed that this was the first time a school had ever used such machines. They will be used for all future elections.)

The Student Council is composed of 43 elected representatives of the undergraduate student body. The nineteen senior members are elected by schools or departments while the 15 junior, sophomore, and freshmen members are elected by their respective classes. The Associate Dean of Students is faculty advisor for the Council.

President—EUGENE C. DUNWODY
Vice President—LEON J. SCOTT
Secretary—L. NEAL SMITH
Treasurer—VIRGIL R. TEDDER

ALFORD, E. C.
BAKER, R. W.
BALDWIN, E. P.
BENSON, J. W.
BOLGER, P. E.
CALDWELL, E. C.
COBB, C. K.
DUNWODY, E. C.
FINLEY, W. A.
GARLINGTON, C. D.
HARRIS, G. W.
HOLLIS, C. H.
JAMES, R. L.
JORDAN, R. G.
KEITH, G. L.
MARSHALL, S. E.
NORWOOD, G. R.
OLIVER, A. G.
PADEN, R. S.
PINNELL, J. K.
REU, M. C.
ROLLER, J. E.
SCOTT, L. J.
SIBLEY, W. A. L.
SMITH, L. N.
TAYLOR, C. A.
TEDDER, V. R.
VAN LEER, S. W.
WHITFIELD, C. J.
WILLIAMS, F. E.

PUBLICATIONS BOARD

This Board was organized in July, 1945, at the request of the Student Council. The purpose of this Board is to be responsible for the student publications on the Georgia Tech campus. Officers of the Board for 1954-55 are:

Chairman: DEAN JOHN J. PERSHING
Secretary: RONALD JORDAN

THE TECHNIQUE

GORDON OLIVER ..... *Editor*
HUGH WHITE ..... *Business Manager*
H. W. ADAMS ..... *Faculty Advisor*

THE YELLOW JACKET

GORDON ALBURY ..... *Editor*
WILLIAM MITCHELL ..... *Business Manager*
WALTER OTT ..... *Faculty Advisor*

THE BLUE PRINT

GORDON K. TRAVIS ..... *Editor*
RALPH PADEN ..... *Business Manager*
J. C. BROOKS ..... *Faculty Advisor*

THE GEORGIA TECH ENGINEER

CECIL PHILLIPS ..... *Editor*
WILLIAM CHEEK ..... *Business Manager*
J. P. VIDOSIC ..... *Faculty Advisor*

YOUNG MEN'S CHRISTIAN ASSOCIATION

Every student enrolled in the Georgia Institute of Technology is privileged to use all the facilities of the Georgia Tech Y.M.C.A.

The Y.M.C.A. Cabinet and other related groups sponsor religious, service, and recreational programs open to all students and faculty.

The Georgia Tech Y.M.C.A. renders service to students in a variety of ways such as: a barber shop, a reading room, lounge facilities, club and meeting rooms, a dark room, a picnic area, a volley ball court, table tennis and equipment, radio and television.

A Y.M.C.A. group publishes and distributes the "T" Book as information for new students.

The Y.M.C.A. building houses the TECHNIQUE, the BLUE PRINT, the YELLOW JACKET, the ENGINEER, the office of the Director of Music and the Georgia Tech Glee Club.

The staff of the Y.M.C.A. includes two trained secretaries who assist students and student groups to maintain a high grade religious, educational and recreational program.

MOTION PICTURES—Monday evenings (free.)

RELIGIOUS PROGRAMS—These include a weekly Bible Study group under competent leadership.

RECREATIONAL PROGRAMS—The regular Friday evening OPEN HOUSE from 8:30 until 11:00 o'clock; special recreational outings at the Y.M.C.A. Camp, and many affairs for Tech students of a leisure time nature.

CABINET-COUNCIL—Leadership groups which meet weekly.

FRESHMAN Y.M.C.A. CAMP—Orientation for new students.

Y.M.C.A. CAMP—Available to all Georgia Tech students, faculty and their friends.

Occasional programs include conferences, deputations to other colleges, forums, lectures, picnics, tournaments, and a program in co-operation with campus-church groups.

The Georgia Tech Y.M.C.A. is the campus center for extra-curricular and leisure time activities. The facilities and program of the Y.M.C.A. are open to all students and faculty and their friends to whom a cordial welcome is always extended.

FRATERNITIES

Interfraternity Council—Composed of two representatives from each national fraternity at Georgia Tech, and Dean Pershing, as advisor, the Interfraternity Council is the governing body for all social fraternities on the campus. The Council sets such regulations as rush-week rules, house rules, and pledge and membership regulations.

OFFICERS 1954-55

I.F.C.

MICHAEL CADY.....*President*
WILLIAM CHEEK.....*Vice President*
FLOYD FOWLER.....*Secretary*
WILFRED SMITH.....*Treasurer*

FRATERNITY	
Alpha Epsilon Pi	Robert Scharf
Alpha Tau Omega	Elmer Bandy
Beta Theta Pi	A. T. Trimble
Chi Phi	W. E. Moeller
Chi Psi	W. B. Mullen
Delta Sigma Phi	Jamie R. Anthony
Delta Tau Delta	Vernon Shipley
Kappa Alpha	Barney Chisom
Kappa Sigma	Wylie Keck
Lambda Chi Alpha	Ralph Lathem
Phi Delta Theta	Mrs. J. H. Crosland
Phi Epsilon Pi	E. J. Govenstein
Phi Gamma Delta	F. C. Bragg
Phi Kappa Sigma	V. Crawford
Phi Kappa Tau	A. D. Holland
Phi Sigma Kappa	R. H. Pretz
Pi Kappa Alpha	J. T. Haynes
Pi Kappa Phi	P. T. Eaton
Sigma Alpha Epsilon	Eugene Monk
Sigma Chi	W. C. Bliss
Sigma Phi Epsilon	J. M. Wallace
Sigma Nu	W. E. Moeller
Tau Epsilon Phi	I. E. Perlin
Tau Kappa Epsilon	J. P. Edgerly
Theta Chi	L. W. Barnes
Theta Xi	H. L. Durham

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SORORITY	
Alpha Xi Delta	Mrs. Blake R. Van Leer

PROFESSIONAL AND TECHNICAL SOCIETIES

Departmental Societies	Faculty Advisor
American Asso. of Textile Colorist and Chemists	William Postman
American Ceramic Society	Lane Mitchell
American Chemical Society	W. C. Whatley
American Institute of Chemical Engineers	H. C. Lewis
American Institute of Electrical Engineers	E. R. Weston
American Institute of Industrial Engineers	Dale Jones
American Society of Civil Engineers	R. K. Chalfant
American Society of Mechanical Engineers	W. A. Hinton
Architectural Society	Sam Hurst
Institute of Aeronautical Sciences	J. H. Harper
Institute of Radio Engineers	B. J. Dasher
Physics Club	Dr. V. Crawford
Society for Advancement of Management	Fred Wenn
Society of Military Engineers	C. C. Baldwin
Tech Management Club	A. R. Marshall
Departmental Honorary Societies	
Alpha Pi Mu (IE)	R. T. Stanton
Arnold Air Society	Major F. O. McClure
Chi Epsilon (CE)	B. Boguslavsky
Delta Kappa Phi (Textile)	G. B. Fletcher
Eta Kappa Nu (EE)	F. O. Nottingham
Keramos (Cer)	L. Mitchell
Phi Lambda Upsilon	James Gladden
Phi Psi (Textile)	J. W. McCarty
Pi Delta Epsilon	
Pi Tau Sigma	M. J. Goglia
Scabbard and Blade (Mil)	Elmer Bandy
Sigma Pi Sigma (Physics)	Vernon Crawford
Honorary	
ANAK	G. C. Griffin
Briaerean Society	I. E. Perlin
Kappa Kappa Psi	Ben Sisk
Koseme	Carlton Parker
Omicron Delta Kappa	W. A. Flinn
Phi Eta Sigma	A. H. Bailey
Phi Kappa Phi	W. L. Carmichael
Tau Beta Pi	M. J. Goglia
Religious	
Baptist Student Union	W. Mullen
Canterbury Club	R. Fleddermann
Newman Club	Catholic Faculty Committee
Wesley Foundation	B. C. Speers, Jr.
YMCA	R. C. Commander

LOAN FUNDS AND SCHOLARSHIPS

The Adair-Oldknow Scholarships

Alumni of the school have established scholarships known as the George W. Adair and the William E. Oldknow Scholarships, in memory of these loyal Tech men. The scholarships have now been put on the N.C.A.A. basis.

Alexander-Tharpe Scholarship Fund

This scholarship fund was established by alumni and friends of the school for tuition and fees. This fund is in honor of the late Coach William A. Alexander, Athletic Director, and in memory of McCall (Mack) Tharpe, who coached at Georgia Tech from 1927 to 1942.

Louis Allis Company Engineering Scholarship

One $500 scholarship to be awarded to a rising senior for his senior year of study in Electrical Engineering. Recipient will be selected by the Scholarship Committee on recommendation from the School of Electrical Engineering. Award will be made to the student who has the best aptitude and interest in electrical machinery in either a sales, design, or manufacturing capacity; has a high degree of engineering skill; has the necessary qualities of integrity, character, and leadership; and who works well with others.

Aluminum Company of America Scholarships

Five $500 Engineering Scholarships for entering freshmen. Recipients are selected by the Georgia Institute of Technology Scholarship Committee within its established procedures. Need, ability, and scholastic standing are the prime factors in the selection of candidates.

The American Brake Shoe Company Scholarships

Two scholarships of $500 per year. One to be awarded to a student in his junior year in any one of the following schools: Industrial Engineering, Chemical Engineering, Mechanical Engineering, Chemistry, and Industrial Management. The other scholarship is unrestricted as to the course of study.

American Enka Corporation Scholarships

Four $400 scholarships per year. Two to be awarded to entering freshmen, one to a Junior student and one to a Senior student. Open to students entering or majoring in the fields of Chemical, Industrial, Mechanical or Textile Engineering. Recipients must be citizens of the United States. Awards are made on the basis of need, ability, evidence of good character, and scholastic standing.

American Viscose Corporation Scholarship

One $500 scholarship for a Junior or Senior student in the School of Textile Engineering. Recipient will be selected by the Georgia Institute of Technology in accordance with its customary procedure.

Armco Foundation Scholarships

Four scholarships, two Junior and two Senior, per year. Each scholarship amounts to $300 per year for a Georgia student or $600 per year for an out-of-state student. One Junior and one Senior scholarship are restricted to Civil Engineering students. Any student in the fields of engineering, chemistry, or physics is eligible to compete for the other two. Selection is made from candidates who have demonstrated scholarship, leadership, character, and other potentialities for success in a technical industry. Selection is made by the Institution subject to the approval of donor.

Atlantic Refining Company Science and Engineering Scholarship

One scholarship of $500 per year to be awarded to a qualified student during the final two years of undergraduate work in the School of Electrical Engineering.

Eugene O. Batson Scholarship Fund

This fund of $10,000 was created by Mr. E. O. Batson in memory of his son, the income to be given to deserving students.

Union Carbide and Carbon Corporation Scholarship Sponsored by the Carbide and Carbon Chemicals Company

A tuition scholarship plus a cash stipend for a senior in the Schools of Chemical Engineering or Mechanical Engineering (alternating every other year). Award will be made by the Georgia Institute of Technology Scholarship Committee upon recommendation of the School concerned.

The Jesse H. Jones Scholarships Honoring General Lucius D. Clay

The sum of $10,000 (in annual payments to the Georgia Institute of Technology not to exceed an average of $1,000 a year) has been given by Mr. and Mrs. Jesse H. Jones in the name of General Clay. The scholarships thus established are for the use of Civil Engineering students, with outstanding qualifications, who might otherwise be prevented from obtaining an education. The awards vary from $200 to $500 per student, according to his needs. These scholarships are outright gifts.

Patterson and Dewar Scholarship Fund

Fund of approximately $400 per year established by Patterson & Dewar Engineers to be awarded to senior co-op students.

Douglas Aircraft Company, Inc. Scholarship

One scholarship in the amount of $600 to be awarded to a senior student in Aeronautical, Mechanical, or Electrical (electronics) Engineering.

General Electric Company Scholarship

One $500 scholarship to be awarded to a Junior for his senior year of study. Recipient should be in top 25% of his class and interested in the broad field of advertising, sales promotion, and public relations. He must be an American citizen or have taken out his first papers. Character, leadership, and extracurricular activities are to be considered. Need for financial aid not a prime factor, but should be considered.

Holeproof Hosiery Company Scholarship

One $800 scholarship open to graduates of Marietta High School, Marietta, Georgia, for study in the A. French Textile School. Recipient is selected by the Scholarship Committee of the Georgia Institute of Technology after consultation with the Superintendent of Schools in Marietta. Basis of selection will be scholastic ability, character, and financial need.

The John P. Holmes Scholarships Honoring Ben Z. and Sallie P. Holmes

This scholarship was set up by John P. Holmes in memory of his parents to provide, if the proceeds of the fund are sufficient, one or more scholarships annually to undergraduates which the Scholarship and Loan Committee considers worthy from an academic standpoint as well as from the standpoint of financial need.

Keever Starch Scholarship

One scholarship of $400 per year to be awarded to a qualified Textile Engineering student (manufacturing or finishing of textiles) requiring financial assistance.

Lockheed National Engineering Scholarship

Established by the Lockheed Leadership Fund for worthy young men and women who are citizens of the United States. Recipients must be secondary school graduates under twenty-five years of age who plan to major in a field of engineering applicable to the aircraft industry. In the selection of this award, the scholarship committee will give recognition to factors other than scholastic achievement. Grant will be for full tuition plus $500 toward living expenses. Grant is renewable for three additional years.

Lowry Memorial Scholarship Fund

This scholarship was set up by Colonel Robert J. and Emma C. Lowry for the purpose of assisting legal residents of the State of Georgia to obtain a college education who, because of lack of funds, might otherwise be deprived of this opportunity. The interest on approximately $500,000 is distributed as gift or loan scholarships, depending on the individual needs of the students.

The Magnolia Petroleum Company Scholarship

One $750 scholarship for the encouragement, assistance, and recognition of a student, preferably a senior, in the school of Electrical Engineering. Consideration will be given to candidates' scholastic record, evidence of leadership, character, and sincerity of purpose. Recipient is to be selected by the School of Electrical Engineering and the Donor.

McLendon Scholarship Fund

Fund of $500 established to be awarded to qualified students of good character, in financial need, and would be otherwise unable to pursue their education.

Monsanto Chemical Company

One tuition scholarship to be awarded to an outstanding student for his senior year of study in the School of Chemical Engineering. Selection of recipient will be made by the Scholarship Committee of the Georgia Institute of Technology on recommendation of the School of Chemical Engineering.

The J. D. Rhodes Scholarships

The late J. D. Rhodes left one-third of the income of the Rhodes Building, Atlanta, for the purpose of educating boys at the Georgia Institute of Technology. The trustees of this fund have made the scholarships available to those juniors and seniors who have excelled in athletics and in scholarship. These scholarships are patterned after the Cecil Rhodes Scholarships, Oxford University.

Rossville Memorial Center Scholarship

This scholarship was established by the Rossville Memorial Center of Rossville, Georgia, in the amount of $750.00 per year for a four-year period, to be awarded to a Rossville High School graduate. Selection of recipient will be made by the Rossville Memorial Center and all inquiries should be made to: The Rossville Memorial Center, Peerless Woolen Mills, Rossville, Georgia.

Square D Scholarship

One scholarship of $500 per year established by the Square D Company of Detroit, Michigan. Award is to be made to a first-quarter junior student in the School of Electrical, Mechanical, or Industrial Engineering.

The Tellepsen Foundation Scholarship

This fund of $1,000 per year for a 10-year period was established by the Tellepsen Foundation of Houston, Texas, for the purpose of assisting outstanding young men who, because of lack of funds, might be deprived of the opportunity of a college education.

The Textile Engineering Scholarship Plan of The Textile Education Foundation, Inc.

The Textile Education Foundation, Inc., of Atlanta, Georgia, established this scholarship plan in 1952 for the purpose of encouraging and assisting worthy young men who seek to obtain an education in textile engineering. A maximum of five scholarships will be awarded annually, each scholarship amounting to $600 per scholastic year for each of four scholastic years provided the recipient maintains the required qualifications. Applicants must be residents of the State of Georgia and entering their first year of educational instruction under the co-operative plan in the A. French Textile School at the Georgia Institute of Technology. For further information write to: The Director, A. French Textile School, Harrison Hightower Building, Georgia Institute of Technology, Atlanta, Georgia.

Starke Patteson Scholarship

One or more annual tuition scholarships. Recipients are to be selected from boys entering Georgia Tech under the Co-operative plan from the following Shelby County, Tennessee, high schools: Central High School, Memphis; East High School, Memphis; Humes High School, Memphis; Memphis Tech High School; Messick High School, Memphis; South Side High School, Memphis; Treadwell High School, Memphis; Catholic High School, Memphis; Frazier High School, Memphis; Whitehaven High School, Whitehaven, Tenn.; Bartlett High School, Bartlett, Tenn.; Millington High School, Millington, Tenn.; Germantown High School, Germantown, Tenn.; Collierville High School, Collierville, Tenn.; Bolton High School, Arlington, Tenn. Awards will be made by the Georgia Institute of Technology Scholarship Committee upon the recommendation of a Memphis Advisory Committee.

The Atlanta Federal Savings Scholarships

Two annual $500 scholarships, one freshman and one senior. Awards will be made on the basis of scholastic record and financial need to male graduates of Atlanta and Fulton County high schools for study in the School of Industrial Management.

American Cyanamid Company Undergraduate Scholarship

The scholarship consists of a $600 stipend to a junior or senior in the School of Chemical Engineering.

Louie Jones Cassels Scholarships

Scholarship fund established by the Richard K. Whitehead Foundation to help students entering Georgia Tech under the Co-operative Plan.

The Martin Aircraft Scholarship Fund

One or more annual scholarship grants of $307 each to cover tuition for the first academic year of co-operative students from Maryland and the District of Columbia.

Procon Incorporated Scholarships

Two annual scholarships of $500 each to be awarded to senior students, one in the School of Civil Engineering and one in the School of Mechanical Engineering.

Annie Laura Galloway Phillips Scholarship

A $200 annual scholarship established to help deserving boys. Award will be made on the basis of scholastic record and financial need.

Schlumberger Collegiate Awards

Two $500 undergraduate scholarships. Awards are to be made to students of high academic standing in their junior or senior year in the Schools of Electrical, Mechanical or Petroleum Engineering, or Physics. Student must complete, prior to earning his undergraduate degree, at least twelve hours study in electricity.

Universal Oil Products Company Scholarship

$1000 per year scholarship fund established to aid worthy students in their senior year of study in the School of Chemical Engineering. Awards are made on the basis of academic record and financial need.

Women's Chamber of Commerce Scholarship

A $300 per year scholarship fund to be conferred upon any needy Georgia woman student at the Georgia Institute of Technology with the specification that the same student may be eligible to receive the fund for more than one year; scholarship is to continue until such time as the organization deems it necessary to withdraw.

The Lewis H. Beck Fund

The Lewis H. Beck Scholarship Fund is a student loan fund created by the late Mr. Lewis H. Beck of Atlanta, for the benefit of students attending Georgia Institute of Technology who are residents of Georgia. It is administered by a special Board of Trustees. For information write to the office of the Lewis H. Beck Foundation, Candler Building, Atlanta, Georgia.

Pickett and Hatcher Educational Fund

The late Mr. Claude A. Hatcher of Columbus, Georgia, created an educational loan fund for the purpose of aiding a large number of worthy students in securing courses in broad liberal college training. Loans are available for students of all classes, including graduates. Limitations prevent loans being granted to students of law, medicine and for the ministry.

Applications and requests for additional information should be addressed to Pickett and Hatcher Educational Fund, 215 First National Bank Building, Columbus, Georgia.

Loan Funds

Generous friends of the institution have established funds of varying amounts which are used for emergency loans. The Office of the Dean of Students operates three Emergency Loan Funds for students. It established the M. L. Brittain Loan Fund started by the President Emeritus of Georgia Tech; the Bill Busbin Fund started by Mrs. T. E. Busbin; and the John Jarrell and Tech Women's Club Loan Fund. Loans are made from these funds without interest for emergencies only.

Geo. W. Adair Loan Fund	$ 558.00
Wm. Ott Alston, Jr., Memorial Loan Fund	551.00
Architects Loan Fund	234.00
J. Baldwin Loan Fund	52.00
M. R. Berry Loan Fund	3,169.00
James G. Boswell Foundation Loan Fund	4,027.00
S. F. Boykin Fund	102.00
T. P. Branch Memorial Fund	149.00
Sunday School Class of Dr. M. L. Brittain Loan Fund	613.00
Brittain-Busbin-Jarrell Emergency Fund	552.00
J. B. Campbell Loan Fund	611.00
J. L. Cloudman Fund	12,576.00
Holland Coleman, Jr., Loan Fund	762.00
Wm. B. Coleman Loan Fund	480.00
Alice Spencer Coons Loan Fund for M. E. Student	1,234.00
A. C. Dobbs Loan Fund	85.00
Arthur J. Dyer Loan Fund	1,010.00
The A. French Loan Fund	1,998.00
Georgia Federation of Labor Loan Fund	1,030.00
Mrs. A. V. Gude Loan Fund	235.00
Lyman Hall Loan Fund	1,796.00
J. M. High Loan Fund	2,399.00
Dr. and Mrs. T. P. Hinman Loan Fund	223.00
Irving Subway Grating Co., Inc., Loan Fund	386.00
Louis Ghohstein Johnson Fund	513.00
K. A. Foundation Loan Fund	
Clyde L. King, Sr., and John King Memorial Fund	2,957.00
Malta Lodge Loan Fund	1,297.00

Lona Mansfield Loan Fund	959.00
Mrs. T. O. Marshall Loan Fund	1,200.00
E. P. McBurney Loan Fund	10,802.00
J. A. McFarland Loan Fund	$ 122.00
Thomas E. Mitchell Loan Fund	446.00
Joseph N. Moody Loan Fund	2,365.00
Gayle Nimmocks Memorial (Pi Kappa Phi)	156.00
Quartermaster Loan Fund	42,066.00
L. W. Robert Fund	107.00
Scottish Rite Loan Fund	1,230.00
Sam W. Small Loan Fund	108.00
T. W. Smith Loan Fund	302.00
J. P. Stevens Loan Fund	5,582.00
Joseph M. Terrel Loan Fund	1,232.00
Thomaston Mills Loan Fund	1,502.00
Clark Thornton Memorial Fund	414.00
E. A. Turner Loan Fund	51.00
Arthur Williams Estate Emergency Trust	668.00
Mrs. Fannie D. Wright Loan Fund	1,060.00

Applicants for loans must qualify in scholarship and character, besides presenting evidence of bona fide need of financial assistance.

Graduate Fellowships

See listing under Graduate Division on page 222.

MEDALS AND PRIZES

The Honor Society of Phi Kappa Phi

Among the prizes offered for scholarship by the Georgia Institute of Technology is membership in the honor society, Phi Kappa Phi, to which a limited number of seniors representing all departments are elected annually. Phi Kappa Phi is a national organization with chapters in many of the leading universities and colleges. Wherever it has been established it has proved a stimulus not only to scholarship but to all-around manhood.

The local chapter of Phi Kappa Phi awards annually a scholarship cup to that member of the senior class who, on the basis of all work taken in this institution, ranks scholastically as one of the first two students in the class.

Tau Beta Pi

Tau Beta Pi is a national honorary engineering fraternity with chapters in most of the leading engineering schools of the country. The Alpha Chapter of Georgia offers membership to approximately twenty-five engineering students of each graduating class who can qualify according to standards of scholarship, character, loyalty, personality, leadership, and school activities. The fact that Tau Beta Pi is the second oldest honorary fraternity in the country and numbers among its members many of our leading engineers, makes membership in the society a coveted honor.

The local chapter of Tau Beta Pi awards annually a scholarship cup to an outstanding engineering senior who ranks among the first five of his class, on the basis of all scholastic work taken in this institution. The selection is made by a committee composed of Tau Beta Pi faculty members, heads of the Engineering Schools, and a representative from the faculty Committee on Honors and Prizes.

Phi Eta Sigma

Phi Eta Sigma is a freshman honor society in which any male student is eligible for membership who has made an average grade of at least 3.5 on the work of the first term of the freshman year. The society awards a scholarship cup to the freshman who makes the highest average for the first term.

Textile Scholarship Medals

A medal is awarded by the National Association of Cotton Manufacturers to the senior in the Textile Department who has the highest scholastic record from the beginning of the course.

The Cotton Manufacturers' Association of Georgia awards a medal annually to a member of the senior textile class, based on scholarship throughout his course, and for original effort in the work of the Textile Department during his senior year.

The American Association of Textile Technologists makes an award annually in the form of a suitable plaque to a member of the graduating

class of the A. French Textile School. This award is based on scholarship and other personal qualities which indicate an outstanding student.

Briaerean Scholarship Cup

The Briaerean Society of the Georgia Institute of Technology presents annually a scholarship cup to a senior member of the society whose scholastic average for a period of four and one-half years entitles him to rank as one of the highest three members of the class.

Fraternity Scholarship Cup

The Interfraternity Council awards quarterly a scholarship cup to the chapter of that organization which makes the highest scholastic average.

Architectural Medal and Prize

The American Institute of Architects awards each year to a member of the graduating class a medal for excellence in architecture. The winner of this medal, who must have a general scholastic average of at least "B", is recommended to the Committee on Honors and Prizes by the Faculty of the School of Architecture.

A set of books is offered each year to the senior in Architecture placing first in a special competition. This prize is given by the Alumni and members of the Georgia Chapter of the American Institute of Architects.

Alpha Chi Sigma Prize

The Professional Chemical Fraternity, Alpha Chi Sigma, presents annually a handbook to the junior who has made the best record in the Chemistry or Chemical Engineering Course.

A. I. Ch. E. Awards

The American Institute of Chemical Engineers awards a badge and certificate to that junior in Chemical Engineering who has made the highest record on the work of the first two years—for co-operative students the first three years.

The Student Branch of the A. I. Ch. E. presents annually a handbook to an outstanding junior Chemical Engineering student, selected by vote of the members of the student branch.

Eta Kappa Nu

The Eta Kappa Nu Association, national electrical fraternity, awards annually an electrical engineering handbook to the regular sophomore Electrical Engineering student (on the basis of four quarters) or to the co-op pre-junior electrical engineering student (on the basis of four quarters) having the highest scholastic average. This award is made at the annual Honors Day exercises.

Delta Kappa Phi

The Delta Kappa Phi Plaque is awarded annually to the graduating senior selected as the outstanding graduate in the textile department. A certificate is presented at the annual Honors Day exercises. Delta Kappa Phi is the oldest national honorary textile fraternity in the country.

Pi Tau Sigma

Pi Tau Sigma, National Mechanical Engineering Fraternity, elects to membership outstanding mechanical engineering students in the junior and senior years.

An annual award of an engineering handbook is made to the highest ranking sophomore student in Mechanical Engineering (based upon at least four quarters of work).

Aeronautical Engineering Medal

The James Edward Oglethorpe Chapter of the Daughters of the American Colonists presents annually a medal to the member of the graduating class in Aeronautical Engineering who has made the highest scholastic average, based on the work of at least four complete quarters.

Industrial Management Certificate

The Industrial Management Society, senior honorary organization for I.M. students, awards annually a certificate of scholarship to the senior in the School of Industrial Management who ranks first in his class on the basis of all scholastic work taken at Georgia Tech.

The William Gilmer Perry Award

The Department of English awards annually a fifty dollar bond to the student in his first year who has done the best work in freshman English. This award is made through the courtesy of the Georgia Tech Alumni Foundation in honor of Dr. William Gilmer Perry, late Professor of English.

Alpha Pi Mu Award

The Alpha Pi Mu Award is presented yearly to extend recognition and honor to that senior student in Industrial Engineering School who has exhibited outstanding scholastic achievement tempered with those individual characteristics which the members of Alpha Pi Mu consider necessary for success. The recipient of the award is chosen from the three top seniors scholastically, and the presentation is made as the Annual Honors Day Exercises.

American Institute of Industrial Engineers Award

The A.I.I.E. Award is presented to the sophomore who is chosen from the top three in his industrial engineering class as having the best combina-

tion of personal and academic qualities. The presentation is made annually at the Honors Day Exercises.

Society for Advancement of Management Award

The S.A.M. Award is presented at the annual Honors Day Exercises to the industrial engineering junior who is most outstanding in scholastic attainment and who has demonstrated such personal qualities as leadership, character, and breadth of interest.

Georgia Engineering Society Awards

Four awards consisting of a cash prize and certificate are awarded each year by the Georgia Engineering Society. Three awards are given to Juniors in the College of Engineering who have earned the highest accumulative grade-point average at the end of the Winter Quarter. Not more than one award is given to students in any one of the schools of engineering. One award is given to the Junior in the School of Architecture who is judged by a committee to be the most promising all-around student. The recipients must have completed at least six quarters of work at the Institute.

Silent Hoist and Crane Company Materials Handling Prize Award

The income from a $5,000 permanent fund will be awarded each year to the student preparing the best paper on the subject of "Materials Handling."

American Institute of Architects Awards

Medal of the A. I. A. and Book is awarded to the outstanding member of the graduating class in Architecture.

A. I. A. Book is awarded to the graduate in Architecture with the second highest record.

The Georgia Chapter A. I. A. awards a $50.00 prize to the outstanding 5th year, Option I student in Design based on the merit of his thesis problem.

The Alpha Rho Chi Medal

The Alpha Rho Chi Medal is awarded to the graduating student in Architecture who has shown ability for leadership, performed willing service for school and department and gives promise of real professional merit through his attitude and personality.

Producers Council Award

The Producers' Council offers three prizes to the outstanding graduating Architectural students with the highest point averages in Option I and II, 5th year and Option IV 4th year.

American Institute of Architects and Georgia Tech Alumni Awards

The Georgia Chapter A. I. A. and Georgia Tech Alumni offer a prize in books in the amount of $18.00. This prize will be awarded to the student who can exhibit the most creditable presentation of his work in freehand sketching, all media included. Work will be judged on the basis of the degree of progress shown by the student in his courses, as well as on presentation.

In so far as funds are available, a book prize amounting to $18.00 will be awarded to the senior making the best record in senior design.

Army R.O.T.C. Prizes and Trophies

The A.B. Steele Trophy, a handsome silver cup, the gift of Mrs. Ray Powers and Mr. A. B. Steele, as a memorial to those "Tech" men who made the supreme sacrifice during World War I, is awarded annually to the best drilled company in the regiment.

The Joseph Habersham Chapter of D. A. R. presents annually a medal to the member of the senior class who attains the highest rating in Military Science and Tactics.

The Georgia Society of Daughters of Colonial Wars presents annually a medal to the cadet officer who attains the highest rating for outstanding leadership.

The Reserve Officers' Association of Atlanta gives annually an officer's Saber to the most outstanding student in Military Science and Tactics.

The U. S. Artillery Association presents annually a medal to the member of the junior class, Artillery Unit, who attains the highest rating for proficiency in scholarship and in Military Science and Tactics.

The Society of American Military Engineers presents annually a gold medal to the outstanding senior engineering student of the Engineer R.O.T.C. Unit. The award is based on academic achievement, attitude, military proficiency in the field, and leadership qualifications.

A gold medal is given annually by the Army Ordnance Association to the member of the junior class of the Ordnance Unit who attains the highest rating in Leadership and Ordnance scholarship.

The Armed Forces Chemical Association presents annually a medal to the member of the junior class of the Chemical Corps Unit who attains the highest rating in academic achievement, leadership, and Military Science and Tactics.

The Association of the United States Army presents annually medals to the outstanding 1st year Advanced Course cadets of the Infantry ROTC battalion and to the outstanding 2nd year Advanced Course cadet of the Artillery ROTC battalion.

The Armed Forces Communication Association presents awards annually to the outstanding sophomore, junior, and senior Army, Navy, or Air Force ROTC cadets who attain the highest ratings for proficiency in scholarship in Military, Naval, or Air Science and Tactics in the field of communications.

The Beta Theta Pi Fraternity, Georgia Tech chapter, presents annually medals to those members of the senior class who are selected as the most outstanding of the Distinguished Military Graduates of each branch of service, Army ROTC.

The United States Veterans Signal Corps Association presents annually a medal to the most outstanding of the 2nd year Advanced Course cadets in the Signal Corps battalion.

The ANAK Society, Georgia Tech, presents annually seven medals, one each to the freshman in the Air, Artillery, Chemical Corps, Engineer, Infantry, Ordnance, and Signal Corps Units, who attains the highest rating for proficiency in Military Science and Tactics.

The Scabbard and Blade Society gives annually a trophy to the captain of the Company which wins the Steele Trophy.

An appropriate award is presented annually to each R.O.T.C. member of the Georgia Tech Rifle Team for proficiency in rifle marksmanship.

Gold, silver, and bronze medals are awarded by the Scabbard and Blade Military Society to students who achieve the highest individual rating for excellence in military drill.

The American Legion Medal is presented annually by the Fulton County Voiture 217, 40 and 8, Honor Society of the American Legion to the second year Basic Student who is accorded highest rating in military subjects, personal qualifications, leadership, and scholastic average.

Air R.O.T.C. Medals and Trophies

The Georgia Institute of Technology Armed Forces Award, the highest award given, is presented annually to the senior AFROTC cadet outstanding for both academic and military achievement.

The Air Force Association annually gives a medal to the AFROTC junior who attains the highest rating for proficiency in leadership, scholarship and in Air Science.

The Arnold Air Society presents two medals annually, one to the outstanding AFROTC sophomore, and one to the outstanding member of the Drill Team.

The ANAK Society of Georgia Tech annually awards a medal to the freshman who demonstrates the highest proficiency in Air Science.

The Armed Forces Communications Association award is presented annually to the outstanding AFROTC senior in the field of Electrical Engineering.

The Armed Forces Chemical Association awards are presented annually to the junior AFROTC cadets having the highest scholastic averages, nation wide, in Chemistry or Chemical Engineering.

The American Legion Medal is presented annually by the Fulton County Voiture 217, 40 et 8, Honor Society of the American Legion, to the outstanding freshman AFROTC cadet who is outstanding in leadership, academic achievement and military proficiency.

The Howard Shaw Leadership Trophy is annually awarded by Mr. Howard Shaw to the senior AFROTC cadet who has demonstrated the highest qualities of leadership.

The McGuire Medal, presented by Beta Theta Pi, is annually awarded to the distinguished AFROTC senior.

An appropriate award is presented annually to each AFROTC member of the Georgia Tech Rifle Team for proficiency in rifle marksmanship.

The Society of American Military Engineers' Eagle Award is presented to the ten outstanding senior engineering students of the nationwide AFROTC program.

Gold, silver, and bronze medals are awarded by the Scabbard and Blade Military Society to cadets who achieve the highest individual rating for excellence in military drill.

Various aviation trophies are presented by the major aircraft manufacturers.

Naval ROTC Medals and Awards

The Georgia State Society "United States Daughters of 1812" awards a gold medal each year to the NROTC senior who achieves the highest rating in Naval Science.

The ANAK Society awards annually two medals; one to the NROTC junior showing highest proficiency in Theoretical and Practical Navigation, and the other to the NROTC freshman showing highest proficiency in Naval Science during his freshman year.

The Scabbard and Blade Society gives annually an award to the outstanding NROTC senior.

The McGuire Medal is presented annually to the distinguished senior regular midshipman and to the distinguished senior contract midshipman.

The Atlanta Chapter of the Reserve Officers of the Naval Service presents annually an award to the sophomore NROTC student showing the greatest proficiency in ordnance, gunnery, and fire control.

An appropriate award is presented each year to each NROTC member of the Georgia Tech Rifle Team for proficiency in rifle marksmanship.

The Armed Forces Chemical Association award is presented annually to the junior NROTC student at each of five NROTC schools, having the highest scholastic average in chemistry or chemical engineering.

The Society of American Military Engineers awards annually 10 engineering medals for the outstanding engineering NROTC seniors and 10 medals for the outstanding engineering NROTC juniors, selected from all NROTC schools in the United States.

The United States Naval Institute presents awards annually to the senior Regular NROTC student and the senior Contract NROTC student having the highest cruise aptitude marks for summer training.

The Marine Corps Association presents annually an award to the outstanding senior NROTC student who is a candidate for commission in the U. S. Marine Corps.

The Veterans of Foreign Wars of the United States presents the "General Douglas A. MacArthur $1,000 Award" every third year commencing in 1953 to the outstanding Regular NROTC senior in the United States.

GEORGIA TECH ATHLETIC ASSOCIATION

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Editor of the Technique.....*Student Member*
President of the Student Council.....*Student Member*

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J. Frank Broyles.....*Assistant in Football*
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J. H. McAuley.....*Assistant in Swimming*
J. C. Hyder.....*Basketball Coach*
Henry L. Andel.....*Athletic Trainer*
Lyle Welser .....*Gymnastics Coach*
R. N. Miller.....*Assistant in Football*
A. G. Urban.....*Assistant in Football*
R. R. Bossons.....*Assistant in Football*
Jack Griffin .....*Assistant in Football*
John Robert Bell.....*Assistant in Football*

College Athletics

College athletics at the Georgia Institute of Technology are managed by a Board of Directors consisting of seven faculty members, three alumni members and three student members. The President is chairman of the Board and appoints the faculty and alumni members. The student members are the captain of the football team, the editor of The Technique, and the president of the Student Council. The Business Manager of Athletics, is elected by the Board. The head coaches of the various sports are called into Board meetings from time to time. The Athletic Board holds regular monthly meetings and on occasion called meetings at the discretion of the President. The Board aims to secure cooperation of the faculty and students in athletic affairs to maintain a high standard of sportsmanship and to create adequate facilities to give every student an opportunity to take part in some athletic activity.

The liberal policy adopted by the faculty towards athletics has resulted in such interest in college sports that the number engaged in some form of exercise is large.

Intercollegiate schedules are played in football, cross country, basketball, swimming, track, golf, tennis, baseball, and gymnastics.

Athletic Plant

The Hugh Inman Grant Field, the football stadium, is located in the center of the campus and occupies two full city blocks. The U-shaped stadium seats 40,000 and surrounds one football field and a quarter-mile cinder track. At the open end of the U are located the Naval Armory building, the gymnasium and swimming pool building and the athletic administration building. Under the East Stand, dressing rooms and showers to accommodate 1000 men have been constructed.

The gymnasium seats 2000 for athletic indoor events and 3000 when set up as an auditorium. The swimming pool seats 400 for aquatic events. This building has adequate locker rooms and showers for both men and women.

The Naval Armory houses the Navy R.O.T.C. Unit and in addition furnishes a supplementary gymnasium for intramural and physical training activity.

The athletic administration building houses the athletic and business offices, visitors' dressing rooms, and an adequately designed and equipped wrestling room and corrective exercise room.

The liberality of Mr. John W. Grant, whose donations have reached the sum of $50,000.00, and other money furnished by the Georgia Tech Athletic Association, the State of Georgia, and the government agencies—C.W.A., P.W.A., and W.P.A.—have resulted in a well equipped sports and recreation center worth well over two million dollars. Acknowledgment is also made of the money loaned by Mr. Fred M. Kaufman which made possible the construction of the Naval Armory.

In addition to Grant Field, the Board of Directors in 1930 purchased

a ten-acre tract located four hundred yards north of the main plant. This field is known as Rose Bowl Field and contains three football fields, two baseball diamonds, and a baseball stand which seats 5000.

Some excellent tennis courts have been built on school property directly across from the Gymnasium in Peters Park. Also, twelve additional all-weather courts have been constructed bordering Tenth Street.

The land bounded by 8th Street, 10th Street, Fowler and Cherry Streets has been allocated to athletic purposes by Georgia Tech.

NATIONAL ALUMNI ASSOCIATION

In 1920, under the leadership of William H. Glenn, B.S. in M.E., '91, the various Georgia Tech Alumni Clubs which had been previously organized in Georgia and other States, were banded together into the present Georgia Tech National Alumni Association. Today Georgia Tech alumni, consisting of graduates and former students, are found in nearly every large city in the United States, Central America, and South America.

Some of the worthwhile objectives of the association are to:

1. Maintain an up-to-date record of each alumnus of Georgia Tech.

2. Publish *The Georgia Tech Alumnus.*

3. Organize and expand local Georgia Tech Alumni Clubs.

4. Operate a placement service for Georgia Tech alumni—without cost to either employer or applicant for employment.

5. Organize special events for alumni, such as class reunions, homecoming days, and alumni participation in commencements.

6. Furnish a medium through which alumni may aid and encourage the President of Georgia Tech and his faculty in making it a bigger and better engineering school, and assist in providing scholarships for worthy students.

7. Through the offices of the executive secretary of the Association in Atlanta, Ga., assist visiting alumni with information, introduction to local alumni and other such personal services.

8. Through the various media of publicity, acquaint the general public; the people of Georgia; civic, state and federal officials; industries of the United States and institutions of secondary and higher education with the achievements of the Georgia Institute of Technology and its alumni, in the fields of engineering, education, research, and public service.

The Alumni Secretary, in his capacity as alumni representative, acts as a clearing house for Georgia Tech men after graduation, and all Georgia Tech men are urged to keep their files in his office up-to-date, giving their location, activities, and other points of valuable information, in order that they may be consulted without delay on problems of mutual interest which arise frequently in the central office.

Officers and members of the executive board of the Alumni Association for 1954-55 are: David J. Arnold, '18, Griffin, Ga., president; Jack F. Glenn, '32, Atlanta, vice-president; Eugene C. Smith, '27, Pensacola, Fla., vice-president at large; Paul A. Duke, '45, Atlanta, treasurer; W. Roane Beard, '40, Atlanta, executive secretary; Ivan Allen, Jr., '33, Atlanta;

George H. Brodnax, '23, Atlanta; James S. Budd, '18, Atlanta; Walter E. Crawford, '49, Atlanta; Arthur B. Edge, Jr., '26, LaGrange, Ga.; George C. Griffin, '22, Atlanta; George W. Mathews, Jr., '48, Fort Valley, Ga.; Joe K. McCutcheon, '32, Ellijay, Ga.; Harold Montag, '18, Atlanta; Frank Ridley, Jr., '34, Atlanta; I. M. Sheffield, Jr., '20, Atlanta; R. A. Siegel, '36, Atlanta; Charles R. Simons, '37, Gainesville, Ga.; John C. Staton, '24, Atlanta; Frederick G. Storey, '33, Atlanta; C. Lynn Strickland, '30, Birmingham, Ala.; Freeman Strickland, '24, Atlanta; Henry W. Swift, '27, Columbus, Ga. and Robert B. Wallace, Jr., '49, Editor of the Georgia Tech Alumnus.

GEORGIA TECH FOUNDATION

Organized in 1932, the Georgia Tech Foundation is a non-profit educational organization set up to administer, through a board of 21 outstanding engineers and industrial executives, funds made available by industries and friends of the Georgia Institute of Technology. These funds, realized through contributions, gifts and bequests, are helping the Foundation fulfill its objectives, which are:

1. To make possible the scientific and economic research and investigation necessary for the development of the resources of the South, and to utilize human and natural resources so as to make the South an economically rich and profitable part of the United States and the World.

2. To develop material tests in the laboratories of the Georgia Institute of Technology for the use of American Industry.

3. To train scientific and engineering leaders who will make possible the efficient utilization of manpower in the manufacture of new and better commodities for use in the South and throughout the United States.

4. To foster the continuous coordination of effort between the educational facilities of universities, and the productive facilities of industry.

5. To provide modern equipment and up-to-date facilities at the Georgia Institute of Technology for utilization by small and large industries, and for the training of scientific and engineering leaders.

Members of the Foundation Board of Trustees are: Walter M. Mitchell, '23, President; John P. Baum, '24, Vice President; Charles R. Yates, '35, Treasurer; R. J. Thiesen, '10, Executive Secretary; Fuller E. Callaway, Jr., '26; J. E. Davenport, '08; C. L. Emerson, '08; Thomas Fuller, '06; Y. F. Freeman, '10; Ben R. Gordon, '25; Julian T. Hightower, '19; Wayne James Holman, Jr., '28; George S. Jones, Jr., '12; George W. McCarty, '08; George T. Marchmont, '07; Frank H. Neely, '04; William A. Parker, '19; C. Pratt Rather, '23; Frank M. Spratlin, '06; George W. Woodruff, '17; Robert H. White, '14; Robert B. Wilby, '08.

Income Tax Provisions of Contributions

Funds held by the Georgia Tech Foundation are exempt from taxation by both State and Federal Governments, because it is a non-profit educational organization. Contributions made by individuals and industries to the Foundation are deductible from income for income tax purposes. For full details about limitations and savings in income tax, latest State and Federal tax regulations should be consulted.

Bequests

There are various forms of bequests that can be used. Due to differences in the various state laws, an attorney-at-law should be consulted. A suggested simple form that will serve in some cases is as follows:

I hereby give and bequeath to the Georgia Tech Foundation, Inc., *Atlanta, Georgia, the sum of.....dollars to be used by the Board of Trustees in whatever way will best advance the interests of the Georgia Institute of Technology.*

If the bequest is intended to leave the Foundation the remainder of any estate, the form may be: *All the rest, residue, and remainder of my real and personal property of any kind whatsoever, I give and bequeath to the* GEORGIA TECH FOUNDATION, INC., *Atlanta, Georgia, et cetera.*

Many alumni and friends of Georgia Tech are unable to set aside any large sums but can easily pay the small premium required for a life insurance policy, the proceeds from which can be made payable to the Georgia Tech Foundation.

All money received by the Foundation will be administered and directed by the Board of Trustees according to the wishes of the donors and in the best interests of the Georgia Institute of Technology.

GEORGIA TECH ANNUAL ALUMNI ROLL CALL

The rising cost of higher education has made it imperative that colleges and universities get all possible aid from outside sources. In the calendar year 1946, gifts totaling $8,171,988.00 were given by alumni and alumnae of American colleges and universities through their respective alumni funds.

Thus originated the Georgia Tech Annual Alumni Roll Call, a vehicle by which all Tech men can contribute to their Alma Mater according to their means. The Annual Alumni Roll Call began its eighth year September 1, 1954.

The results of the first seven years of this Roll Call have proved the soundness of this plan. The renewed spirit of giving to Georgia Tech by alumni has been very gratifying to all concerned.

The aid realized through this Roll Call supports the work of the National Alumni Association, with all residual funds being put into trust with Georgia Tech Foundation. The only use to which these funds are put by the Foundation is for the advancement and benefit of Georgia Tech. The work of the Georgia Tech Foundation continues to be one of the most vital factors in the growth and development of the Georgia Institute of Technology.

SCHOOL STATISTICS

GRADUATES BY DEPARTMENTS AND BY YEARS

DEGREES	Initially Conferred	1890 1919	1920 1929	1930 1939	1940 1944	1945 1949	1950	1951	1952	1953	1954	Total
B.S. in Ap.Math.	*1954	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
B.S. in Arc.	1911	43	117	144	1	.....	.....	1	.....	.....	.....	306
B.S. in Arc.E.	1943	.....	.....	.....	8	2	.....	.....	.....	.....	.....	10
B.Arc.	1936	.....	.....	9	24	78	48	47	41	22	35	304
B.S. in A.E.	1932	.....	.....	124	64	42	.....	.....	.....	.....	.....	280
B.A.E.	1940	.....	.....	.....	13	178	48	41	30	25	23	358
B.S. in B.E.**	1944	.....	.....	.....	1	35	.....	.....	.....	.....	.....	36
B.S. in Cer.E.	1927	.....	13	33	24	5	.....	.....	.....	.....	.....	75
B.Cer.E.	1949	.....	.....	.....	.....	4	11	16	10	7	10	58
B.S. in Ch. E.	1903	49	91	301	255	18	.....	.....	.....	.....	.....	714
B.Ch.E.	1945	.....	.....	.....	.....	237	80	86	87	63	58	611
B.S. in Chem.†	1909	14	1	24	26	24	28	14	2	7	6	146
B.S. in C.E.	1902	106	341	344	144	13	.....	.....	.....	.....	.....	948
B.C.E.	1945	.....	.....	.....	.....	230	106	96	87	79	64	662
B.S. in Com.	1919	2	337	330	.....	.....	.....	.....	.....	.....	.....	669
B.S. in E.E.	1898	355	492	597	297	26	.....	.....	.....	.....	.....	1767
B.E.E.	1945	.....	.....	.....	.....	446	286	189	158	111	89	1279
B.S. in G.E.	1923	.....	157	13	54	32	11	2	.....	.....	.....	269
B.S.	1917	4	92	284	80	125	99	91	78	75	59	987
B.S. in I.Ed.	1922	.....	3	3	.....	.....	.....	.....	.....	.....	.....	6
B.I.E.	1946	.....	.....	.....	.....	397	208	136	123	123	88	1075
B.S. in I.M.	1937	.....	.....	134	364	598	316	259	160	199	155	2185
B.S. in M.E.	1890	411	344	540	460	30	.....	.....	.....	.....	.....	1785
B.M.E.	1946	.....	.....	.....	.....	424	178	144	99	76	91	1012
B.S. in N.S.**	1945	.....	.....	.....	.....	55	1	.....	.....	.....	.....	56
B.S. in P.H.E.	1940	.....	.....	.....	26	1	.....	.....	.....	.....	.....	27
B.S. in Phys.	1943	.....	.....	.....	3	29	19	18	14	15	4	102
B.S. in T.E.	1901	109	147	182	81	32	.....	.....	.....	.....	.....	551
B.T.E.	1949	.....	.....	.....	.....	18	18	14	13	8	11	82
B.S. in Textiles	1949	.....	.....	.....	.....	50	84	72	50	39	41	336
Total Bachelors		1093	2135	3062	1925	3129	1541	1226	952	849	735	16647
B.C.S.	1916	26	125	171	.....	.....	.....	.....	.....	.....	.....	321
Master of Science	1925	.....	18	91	52	236	109	149	74	72	97	897
Master of Architecture	1953	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
Master of City Planning	1954	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	4
Doctor of Philosophy	1950	.....	.....	.....	.....	.....	1	2	5	13	8	29
Prof. Degrees	1914	5	17	13	7	3	.....	.....	.....	.....	.....	45
Total Degrees		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17945
Certificates		78	154	55	.....	.....	.....	.....	.....	.....	.....	287

*Dates in this column show the year when the degree was first conferred.

†This degree was not given from 1929 to 1935.

**War emergency degree.

NOTES: The M.S. Degrees, Ph.D. Degrees, Professional Degrees, and Certificates shown above are distributed among the departments as follows:

(1) M.S. in A.E., 64; in Ap.Math., 6; in C.E., 94; in Cer.E., 3; in Ch.E., 65; in Chem., 77; in Com., 1; in E.E., 164; in I.E., 63; in I.Ed., 2; in I.M., 86; in M.E., 77; in Mech., 2; in P.H., 3; in P.H.E., 5; in Phys., 29; in S.E., 3; in San.E., 3; in T.E., 18; in Text., 12; not designated, 120.

(2) Ph.D: Ch.E., 18; Chem., 8; E.E., 3.

(3) Professional Degrees: C.E., 17; Ch.E., 1; E.E., 11; M.E., 15; T.E., 1.

(4) Certificates. Arc., 43; C.S., 38; I.Ed., 1; M.T.C., 14; M.T., 1; T.E., 190.

ABBREVIATIONS: A.E.—Aeronautical Engr.; Arc.E.—Architectural Engr.; B.E.—Basic Engr.; C.E.—Civil Engr.; Cer.E.—Ceramic Engr.; Ch.E.—Chemical Engr.; E.E.—Electrical Engr.; G.E.—General Engr.; I.E.—Industrial Engr.; M.E.—Mechanical Engr.; P.H.E.—Public Health Engr.; S.E.—Safety Engr.; San.E.—Sanitary Engr.; T.E.—Textile Engr.; Ap.Math.—Applied Mathematics; Arc.—Architecture; C.S.—Commercial Science; Chem.—Chemistry; Com.—Commerce; I.Ed.—Industrial Education; I.M.—Industrial Management; Mech.—Engr. Mechanics; M.T.—Manual Training; M.T.C.—Motor Transport; N.S.—Naval Science; P.H.—Public Health; Phys.—Physics; Text.—Textiles.

SUMMARY OF ENROLLMENT 1953-54

College Day Courses

By Classes

Graduate students	381
Fifth year	42
Seniors	1,097
Juniors	732
Sophomores	1,277
Freshmen	1,683
Unclassified	31
Total College Day Courses	5,243

By Major Departments

Aeronautical Engineering	361
Applied Mathematics	23
Architecture	375
Ceramic Engineering	40
Chemistry	62
Chemical Engineering	442
Civil Engineering	503
Electrical Engineering	941
Industrial Engineering	485
Industrial Management	725
Mechanical Engineering	906
Physics	85
Public Health Engineering	1
Textile Engr. and Textiles	289
Unclassified	5
Total	5,243

Engineering Extension Division

Pre-freshman	407
Evening School Collegiate	2,054
Certificate	430
Adult Education	552
Institutes and Conferences	1,989
Southern Technical Institute	722
Trade and Industrial Education	7,287
	13,441
Duplicates	1,052
Total Engineering Extension Division	12,389
Total College Day Courses	5,243
	17,632
Duplicates	304
Grand Total	17,328

INFORMATION

General Information: Write to Registrar, Georgia Institute of Technology, Atlanta, Ga.

Admission, Entrance Examinations, Transfer Credits: Write to Director of Admissions, Georgia Institute of Technology, Atlanta, Ga.

Graduate Studies and Fellowships: Write to Dean of Graduate Division, Georgia Institute of Technology, Atlanta, Ga.

Veterans' Information (except housing): Write to Coordinator of Veterans' Affairs, Georgia Institute of Technology, Atlanta, Ga.

Engineering Studies: For information pertaining to a particular field of engineering study, write to Director, School of..... (insert name of school, such as Textile Engineering, Ceramic Engineering, etc.), Georgia Institute of Technology, Atlanta, Ga.

Cooperative Plan: Admission to the Cooperative Plan is by special consideration. Write to Director, Cooperative Division, Georgia Institute of Technology, Atlanta, Ga.

Dormitory Accommodations on Campus and Reservations: Write to Housing Office, Georgia Institute of Technology, Atlanta, Ga.

Air Training Information: Regarding Air R.O.T.C. and Officers Reserve Corps commissions, write to Air Commandant, Georgia Institute of Technology, Atlanta, Ga.

Military Training Information: Regarding Military R.O.T.C. and Officers Reserve Corps commissions, write to Military Commandant, Georgia Institute of Technology, Atlanta, Ga.

Naval Training Information: Regarding Naval R.O.T.C. training, write to Naval Commandant, Georgia Institute of Technology, Atlanta, Ga.

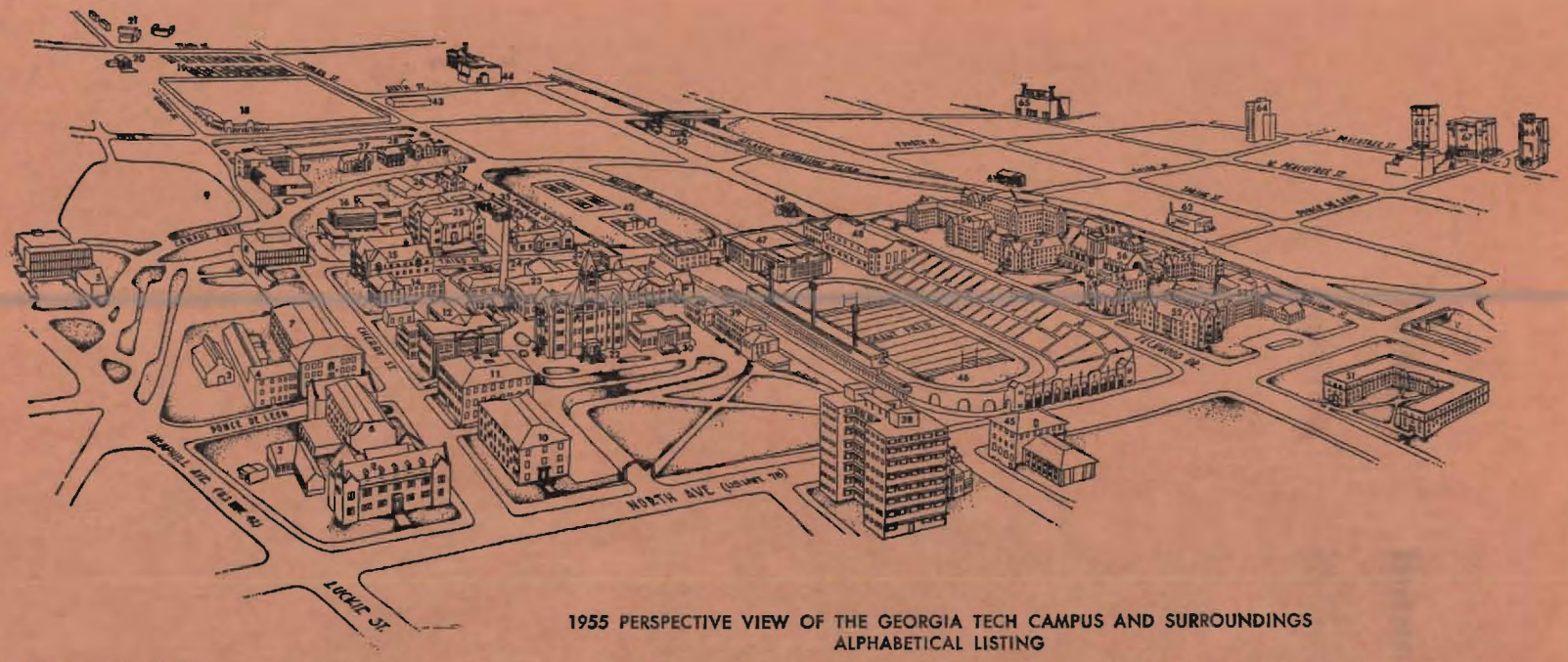
Housing Accommodations off the Campus: Write to Housing Office, Georgia Institute of Technology, Atlanta, Ga.

Extension Division and Engineering Evening School: Write to Director of Engineering Extension Division, Georgia Institute of Technology, Atlanta, Ga.

Part-time Employment: Write to Dean of Students, Georgia, Institute of Technology, Atlanta, Ga.

Alumni Information: Write to Executive Secretary, Georgia Tech Alumni Association, Atlanta, Ga.

GENERAL INDEX



1955 PERSPECTIVE VIEW OF THE GEORGIA TECH CAMPUS AND SURROUNDINGS
ALPHABETICAL LISTING

22 Administration Building
2 Aeronautical Engineering Shop
29 Alpha Tau Omega Fraternity House
17 Architecture Building
41 Athletic Office
37 Beta Theta Pi Fraternity House
65 Biltmore Hotel
56 Brittain Dining Hall
52 Brown Dormitory
38 Burge Apartments
21 Callaway Apartments
30 Carnegie Building
40 Cashier's Office
33 Ceramics Building
32 Chemistry Annex
31 Chemistry Building
34 Chi Phi Fraternity House
25 Civil Engineering Building
57 Cloudman Dormitory
68 Cox Carlton Hotel
62 Crenshaw Field House
27 Delta Tau Delta Fraternity House
11 Electrical Engineering Building
6 Engineering Drawing Building
16 Engineering Experiment Station
4 Foundry
63 Fox Theatre
23 French Industrial Engineering Bldg.
67 Georgian Terrace Hotel
59 Glenn Dormitory
46 Grant Field
1 Guggenheim School of Aeronautical Engineering
47 Gymnasium
54 Harris Dormitory
58 Harrison Dormitory
5 Hightower Textile Building
55 Howell Dormitory
14 Infirmary
50 Kappa Alpha Fraternity Building
49 Kappa Alpha Fraternity House
61 Kappa Sigma Fraternity House
39 Knowles Building
12 Mathematics Building
7 Mechanical Engineering Building
48 Naval Armory
44 O'Keefe High School
9 Parking Lot
3 Pattern Shop
42 Peters Park
35 Phi Delta Theta Fraternity House
15 Physics Building
66 Ponce De Leon Apartments
13 Post Office
20 President's House
8 Price Gilbert Library
26 Rifle Range
24 R. O. T. C. Offices
18 Rose Bowl Field
28 Sigma Alpha Epsilon Fraternity House
36 Sigma Nu Fraternity House
53 Smith Dormitory
43 Social Science Building
10 Swann Hall
Engineering Extension Division
Engineering Evening School
Industrial Education
Industrial Management
51 Techwood Dormitory
19 Tennis Courts
60 Towers Dormitory
45 Y. M. C. A.