the 7th anniversary

GENERAL CATALOGUE
AND ANNOUNCEMENTS

Georgia Institute of Technology

Bulletin 1963-64

HANICAL ENGINEERING • ELECTRICAL ENGINEERING • CIVIL ENGINEERING • TEXTILE ENGINEERING • TEXTILE CHEMISTRY • CHEMICAL ENGINEERING • CHEMISTRY • ARCHITECTURE • CERAMIC ENGINEERING • AEROSPACE ENGINEERING • INDUSTRIAL MANAGEMENT • PHYSICS • INDUSTRIAL ENGINEERING • APPLIED MATHEMATICS • BUILDING CONSTRUCTION • INDUSTRIAL DESIGN • ENGINEERING MECHANICS • APPLIED PSYCHOLOGY • APPLIED BIOLOGY
Bulletin
Georgia Institute of Technology
1963-1964
Vol. 76 April, 1963 No. 2

General Catalogue And Announcements

Second-class postage paid at Atlanta, Georgia. Published four times a year in April, May, August, and October. Edited by the Office of Publications, Georgia Institute of Technology.

A Unit of the University System of Georgia
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 Textile Chemistry  
Bachelor of Science in Textiles  
Bachelor of Chemical Engineering  
Bachelor of Science in Chemistry  
*Bachelor of Architecture  
Bachelor of Ceramic Engineering  
Bachelor of Aerospace Engineering  
Bachelor of Science in Industrial Management  
Bachelor of Science in Physics  
Bachelor of Industrial Engineering  
Bachelor of Science in Applied Mathematics  
*Bachelor of Science in Building Construction  
*Bachelor of Science in Industrial Design  
Bachelor of Science in Engineering Mechanics  
*Bachelor of Science in Applied Psychology  
*Bachelor of Science in Applied Biology  

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 those marked*) and also in:

- Metallurgy  
- Nuclear Engineering  
- Nuclear Science  
- Public Health  
- Public Health Engineering  
- Safety Engineering  
- Sanitary Engineering  

Also offered are the degrees:

- Master of Architecture  
- Master of City Planning  

The degree of Doctor of Philosophy is offered in:

- Aerospace Engineering  
- Chemical Engineering  
- Chemistry  
- Civil Engineering  
- Electrical Engineering  
- Industrial Engineering  
- Mechanical Engineering  
- Physics  
- Sanitary Engineering
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| **AUGUST** | **S M T W T F S** | **S M T W T F S** | **S M T W T F S** |
| 1         | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         | 11         | 12         |
| 8         | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         | 17         | 18         | 19         |
| 15        | 16         | 17         | 18         | 19         | 20         | 21         | 22         | 23         | 24         | 25         | 26         |
| 22        | 23         | 24         | 25         | 26         | 27         | 28         | 29         | 30         |             |             |             |

| **SEPTEMBER** | **S M T W T F S** | **S M T W T F S** | **S M T W T F S** |
| 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         | 11         | 12         |
| 8         | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         | 17         | 18         | 19         |
| 15        | 16         | 17         | 18         | 19         | 20         | 21         | 22         | 23         | 24         | 25         | 26         |
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| **OCTOBER** | **S M T W T F S** | **S M T W T F S** | **S M T W T F S** |
| 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         | 11         | 12         |
| 8         | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         | 17         | 18         | 19         |
| 15        | 16         | 17         | 18         | 19         | 20         | 21         | 22         | 23         | 24         | 25         | 26         |
| 22        | 23         | 24         | 25         | 26         | 27         |             |             |             |             |             |             |

| **NOVEMBER** | **S M T W T F S** | **S M T W T F S** | **S M T W T F S** |
| 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         | 11         | 12         |
| 8         | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         | 17         | 18         | 19         |
| 15        | 16         | 17         | 18         | 19         | 20         | 21         | 22         | 23         | 24         | 25         | 26         |
| 22        | 23         | 24         | 25         | 26         | 27         |             |             |             |             |             |             |

| **DECEMBER** | **S M T W T F S** | **S M T W T F S** | **S M T W T F S** |
| 1           | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         | 11         | 12         |
| 8           | 9          | 10         | 11         | 12         | 13         | 14         | 15         | 16         | 17         | 18         | 19         |
| 15          | 16         | 17         | 18         | 19         | 20         | 21         | 22         | 23         | 24         | 25         | 26         |
| 22          | 23         | 24         | 25         | 26         | 27         |             |             |             |             |             |             |

**CALENDAR 1963-64**

**Summer Quarter 1963**
- **June 21**: New students report for orientation.
- **June 24**: Registration.
- **June 25**: Classes begin.
- **June 26**: Late registration fees apply.
- **June 28**: Last day for registration. Last day for adding a subject.
- **July 1**: Last day for payment of tuition and fees.
- **July 4**: Holiday.
- **July 15**: Last day for dropping a subject without penalty.
- **Aug. 3**: End of deficiency report period.
- **Sept. 6**: End of term.
Calendar of Events / 5

June 9     Summer Surveying Course, first session starts.
July 6     Summer Surveying Course, first session ends.
July 7     Summer Surveying Course, second session starts.
Aug. 3     Summer Surveying Course, second session ends.

Fall Quarter 1963
Sept. 16    All entering freshmen report for orientation.
Sept. 19    Transfer students report for schedule conferences.
Sept. 20    Registration of first quarter freshmen.
Sept. 23    Registration of upperclassmen and transfer students.
Sept. 24    Classes begin.
Sept. 25    Late registration fees apply.
Sept. 27    Last day for registration. Last day for adding a subject.
Sept. 30    Last day for payment of tuition and fees.
Oct. 14     Last day for dropping a subject without penalty.
Nov. 2      Homecoming holiday.
Nov. 2      End of deficiency report period.
Nov. 28-Dec. 1  Thanksgiving recess.
Dec. 13    End of term.
Dec. 14 —   Christmas recess.

Winter Quarter 1964
Jan. 6      Registration.
Jan. 7      Classes begin.
Jan. 8      Late registration fees apply.
Jan. 10     Last day for registration. Last day for adding a subject.
Jan. 13     Last day for payment of tuition and fees.
Jan. 27     Last day for dropping a subject without penalty.
Feb. 15     End of deficiency report period.
Mar. 20     End of term.
Mar. 21-29  Spring recess.

Spring Quarter 1964
Mar. 30     Registration.
Mar. 31     Classes begin.
Apr. 1      Late registration fees apply.
Apr. 3      Last day for registration. Last day for adding a subject.
Apr. 6      Last day for payment of tuition and fees.
Apr. 20     Last day for dropping a subject without penalty.
May 9       End of deficiency report period.
June 12     End of term.
June 13     Commencement.

Summer Quarter 1964
June 29     Registration.
June 30     Classes begin.
Sept. 11    End of term.
June 14     Summer Surveying Course, first session starts.
July 11     Summer Surveying Course, first session ends.
July 12     Summer Surveying Course, second session starts.
Aug. 8      Summer Surveying Course, second session ends.
The University System of Georgia

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Air R.O.T.C.
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Assistant School Physician

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Nurse

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Nurse

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Nurse

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Nurse

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SYLVIA OGLE  Clerk
LINDA CAIN  Typist-Receptionist
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WILLIAM DOUGLAS ROBERTS, B.S., I.M.  
Coordinator
MRS. ROSE MARIE WESTBERRY  
Senior Secretary
MISS LILLIAN ROEBUCK, B.S.  
Secretary
FREDERICK C. BISCOFF, III  
Senior Clerk

Industrial Education
THOMAS H. QUIGLEY, B.S., A.B.  
Professor of Trade and Industrial Education, Director of the Department
WILFORD N. RATCLIFF, B.S.  
Head of the Fire Institute
DALLAS B. COX, B.S.  
Research and Instructional Material Specialist
MRS. ELIZABETH C. SEVERANCE, B.S.  
Secretary
MRS. MARIE N. SLIGH  
Secretary

MRS. RUTH S. ROGERS  
Secretary

Southern Technical Institute
HOYT L. MCCLURE, M.S.  
Director
MRS. MINNIE N. MAVITY  
Administrative Assistant
LOY Y. BRYANT, M.A.  
Registrar
G. L. CRAWFORD, M.S.  
Dean, Technical Division
GEORGE L. CARROLL, M. Ed.  
Dean, Basic Studies Division
CYRUS V. MADDOX, A.B.  
Dean of Students, Acting Head, Mathematics Department
MRS. ARMENTA SIMMONS  
Acting Placement Director
WELDON L. THOMAS, B.A.  
Head, Gas Fuel Department Coordinator, Co-operative Programs
JOHN I. ALFORD, B.S.T.E.  
Head, Textile Department
CLARENCE A. ARNTSON, B.S.  
Head, Mechanical Department
JESSE J. DEFORE, A.B.  
Head, Physics Department
JAMES P. GOODWIN, JR.  
Acting Head, Electrical Department
ROBERT W. HAYS, M.Ed.  
Head, English Department
CHARLES T. HOLLADAY, B.S.C.E., P.E., R.L.S.  
Head, Civil Department
GEORGE M. LAWSON, B.S. Ed.  
Acting Head, Industrial Department
EDWARD J. MULLER, B.S.  
Head, Drawing Department
CHESTER R. ORVOLD, B.S., Reg. Landscape Architect  
Head, Building Construction Department
LEONARD H. TAYLOR, M.S.  
Head, Heating and Air Conditioning Department
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Georgia Tech National Alumni Association
W. Roane Beard, B.S.
  Executive Secretary
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  Associate Secretary
Robert B. Wallace, Jr., B.S.
  Editor, The Georgia Tech Alumnus
Mrs. Mary Peeks
  Administrative Assistant
Mrs. Linda Gibson
  Secretary
Mrs. Theresa H. Ward
  Records and Clerical
Mrs. Nell Ivey
  Records and Clerical
Marion F. Griffin
  IBM Operator

Georgia Tech Foundation, Inc.
Joe W. Guthridge, B.S.
  Executive Secretary
Mrs. Jennie L. Bradley
  Bookkeeper

WGST Radio Station
Jack Collins
  General Manager

Georgia Tech Athletic Association
Robert L. Dodd
  Athletic Director

A. M. Coleman, M.A.
  Assistant Athletic Director and Intramural Director
Robert E. Eskew, M.S.
  Business Manager and Treasurer
Ned West
  Director of Sports Information
Miss Helen Davis
  Ticket Manager
Mrs. Forest Harris
  Secretary
Mrs. Delores Cannon
  Secretary
Mrs. Margie Bennett
  Secretary
Miss Mary Elizabeth Mann
  Secretary
Mrs. Lillian Redmon
  Accountant

Georgia Tech Research Institute
Harry L. Baker, Jr., B.S., L.L.B.
  President
Robley H. Tatum, B.S.
  Assistant to the President
Milton W. Bennett, M.S.
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  Secretary
Mrs. M. Sue Corbin
  Secretary
HISTORICAL SKETCH

A May, 1882, conversation between two Confederate veterans initiated the drive to open a technological school in Georgia. The two men were Major J. F. Hanson, a publisher and manufacturer who became president of a great railroad, and Nathaniel E. Harris, a Macon attorney who eventually became Governor of Georgia. Hanson had the vision for the need for such a school and he called on Harris to make the dream a reality. Harris immediately ran for the State Legislature on the need for a technological school. He was elected and during the next three years all of his efforts were directed toward getting a bill creating such a school passed by the Legislature. After several failures, the bill was finally passed by the narrowest of margins in the summer of 1885.

In April, 1888, Dr. Isaac Hopkins, then president of Emory College at Oxford, Georgia, and a rare combination of a physicist and theologian, was chosen Tech's first president by the Board of Trustees, headed by founder Harris.

Two buildings, both financed by the State, were erected during the Hopkins administration. The Administration Building, which cost $43,250, was completed in 1888 and was the major academic building of the early Georgia Tech. It was used for teaching and administrative offices until December, 1959, when it became purely an administrative office building. The Old Shop Building was also completed in 1888 at an initial cost of $20,000. In 1892 it was badly damaged by fire but was rebuilt the same year at a cost of $10,000. It is still used for classes, laboratories, and offices by the School of Applied Biology and the Department of Social Sciences.

Dr. Lyman Hall, professor of mathematics and a West Point graduate, succeeded Hopkins in 1896. Hall was well-known as a tough disciplinarian. But, he was also a dedicated man who literally worked himself to death in nine years trying to build a decent physical plant for the struggling young school.

In 1896, he added two small temporary dormitories at a cost of $4,000 from State funds.

First major building in his administration was Knowles Dormitory, completed in 1897 at a cost of $20,000, of which $15,000 came from the State. Named for Clarence Knowles, Fulton County legislator who worked so diligently to secure the funds from the Legislature, the building now houses administrative offices.

Next building erected under Hall was the A. French Textile Building, completed in 1898 at a cost of $20,000. Funds for this building and its equipment came from the State ($10,000), Aaron French, Pennsylvania manufacturer for whom the building and Textile Department were named, and from textile manufacturers throughout the State. This building now houses the School of Industrial Engineering.

By late 1901 both the Electrical Building and Swann Dormitory were added to the growing plant. Money for the Electrical (now called the old EE Building) Building came from the State ($16,000) and from private contributions ($2,500), and Swann Hall was financed by a grant of $20,000 from Mr. James Swann providing Hall could raise an additional $15,000 and would name the
dormitory for Swann's late wife. Both conditions were met by Hall within a year. The Electrical Building now houses several research groups, and Swann Hall is headquarters for the Engineering Extension Division and the Modern Languages Department.

Hall's last act was securing a matching grant for a Chemistry Building in 1905. The State had given $10,000 for the building in 1904 and Hall managed to secure the additional $10,000 before he died in August, 1905. The building—named for Lyman Hall—was completed in 1906 and is still used for the teaching of chemistry and for offices.

Dr. Kenneth G. Matheson, professor of English, was named chairman of the faculty on August 23, 1905. Less than a year later, he was named president.

Matheson was the founder of a school library for Tech, operating it in his office and finally expanding it into three rooms in the Administration Building. It came as no surprise then that the new president's first move was toward a library building for the campus. On March 12, 1906, Andrew Carnegie donated $20,000 for a building providing that the school guarantee an annual appropriation of at least $2,000 a year to support the library. The terms were met and by September, 1907, the Carnegie Building, now an administrative office building, was open for student and faculty use.

In November, 1909, Mrs. Joseph Whitehead made an initial gift of $5,000 towards an infirmary for Tech. Within a year, other gifts brought the total of this fund up to $15,000 and construction began on the Joseph Brown Whitehead Memorial Hospital, now called the Dean of Students Building.

Matheson followed this with his February, 1910, announcement that John D. Rockefeller had offered Tech $50,000 for a YMCA Building if the school could raise $25,000. Less than a year later, a fund drive met these terms and in June, 1912, the YMCA Building was dedicated. The building is still in use.

In August, 1910, the Legislature appropriated $35,000 for a Mechanical Engineering Building on the omnipresent condition that $15,000 be raised by the school. Through the aid of the Atlanta Chamber of Commerce, $22,000 was subscribed within two months. The first three units of this building were completed in 1912. After the Legislature appropriated $100,000 in 1919, the remaining units of the Mechanical Engineering Building were completed.

Matheson also initiated the first Greater Georgia Tech campaign of 1914 to raise money to build a Power Plant to house $100,000 worth of equipment donated by manufacturers. The Power Plant Building was completed in 1917.

During Matheson's administration, several important parcels of land were added to the school's property. Included was the land that now holds Grant Field, Tech's 52,000-seat football stadium. This land was purchased in two segments, the first two-thirds in 1906 for $16,000 and the remainder in 1913. The State furnished the money for the initial purchase, while two gifts from John W. Grant were used for the second parcel and to build the West stands in 1913 and 1915. The field was named for Grant's son. The East and South stands were erected during the 1924-25 year through the use of Athletic Association funds. Since then there have been four additions to the stadium all of them built without the use of state money.

The pressures of running Tech finally began to break down Matheson's health and on orders of his physician, he resigned in October, 1921 (effective
April, 1922) to accept the less-taxing position of president of Drexel Institute. For four months after Matheson's departure, N. P. Pratt, chairman of the executive committee of the Trustees, ran the school as administrative executive ad interim.

On July 14, 1922, the Trustees selected Dr. Marion Luther Brittain, the state superintendent of schools, as Tech's fourth president. Brittain's first goal as president was to rebuild the faculty decimated by World War I and the financial crisis in Georgia that followed it. The politically astute Brittain went to the Legislature for more money for Tech and managed to convince the politicians to push through a deficiency bill of $39,000 which he used to raise salaries.

He then approached the Carnegie Foundation for the $150,000 it had pledged to Tech providing the Greater Georgia Tech campaign of 1918-1921 had reached over $1,500,000 in pledges. He received the grant even though less than 40% of the campaign pledges had been paid. With this money and the Greater Tech money, he began construction on the Physics Building which was completed in 1923. It was this building that set the architectural style for the Tech campus for the next 20 years.

The next building on the list was a Ceramic Engineering Building. Brittain, with the help of the State's top ceramics industrialists, raised $500,000 for this new department in less than six months. The building was completed in November, 1924.

Then Brittain's building program began to pick up steam. In 1925, Brown Dormitory was completed at a cost of $85,000 with the funds coming from the Brown Estate and the Greater Georgia Tech campaign. The same year, the $100,000 Emerson addition to the Chemistry Building and Harris Dormitory were completed with the funds again coming from the campaign.

With the help of the money still left from the campaign, federal monies from various agencies (including the WPA and PWA), private donations, and a stronger State support, Brittain managed to add a total of 22 buildings to the growing Tech campus. Included in this group were the Army Headquarters Building (1927), the Brittain Dining Hall (1928), Rose Bowl Field (1929), Cloudman Dormitory (1931), the Naval Armory (1934), Techwood Dormitory (1935), another addition to the Chemistry Building (1936), the Old Gym (1937), the Civil Engineering Building (1938), the Engineering Drawing Building (1938), the Clark Howell Dormitory (1939), the George W. Harrison, Jr. Dormitory (1939), the Engineering Experiment Station Building (1939), the Athletic Office Building (1941), and the Chemistry Annex (1942).

At the close of Brittain's term in 1944, the entire campus was valued at $4,500,000 with over $3,460,000 of that being vested in buildings.

But Marion Luther Brittain's proudest accomplishment was the securing of the Guggenheim award in 1930 which made possible the establishment of the Guggenheim School of Aeronautics.

When Dr. Brittain retired in 1944 at the age of 78 after setting a longevity record of 22 years for a Tech president, the Board of Regents (Tech became part of Georgia's University System in 1933) named Colonel Blake R. Van Leer as his successor. One of Van Leer's first projects was the expansion of Tech. In his 11 years as president, Van Leer saw the campus expand from
50 acres of land to over 130 and the physical plant value rise from $4,500,000 to over $25,000,000.

First new buildings added during the Van Leer administration were the Burge and Callaway Apartments for the faculty and married students. Both were completed during the 1946-47 year and were financed by bonds amortized by rentals. Still more housing followed in September, 1947, when Glenn and Towers dormitories were opened. They, too, were made possible through a self-liquidating bond issue.

First of the major academic structures to go up during the Van Leer administration was the Harrison Hightower Textile Building named for one of the school's great alumni benefactors. The building, financed by the State and equipped by the Textile Education Foundation, Inc., was started in October, 1947, and completed two years later. During 1949, Van Leer's continuing efforts to expand the campus paid off with a $65,000 remodeling of Brittain Dining Hall, another dormitory (Smith), and a new campus lighting system (paid for by the City of Atlanta, Fulton County, and the State of Georgia).

In 1951, the Thomas P. Hinman addition to the Research Building was completed and ground was broken for the Price Gilbert Memorial Library. In September, 1952, the new Architecture Building, funded by the University System Building Authority, was dedicated. In November, 1953, the new library, costing $2,200,000 of the Building Authority money and initiated through a gift from the late Judge Price Gilbert, was dedicated. The Building Authority also financed Tech's $1,000,000 modernization of the heating and electrical switching plant and the $800,000 modernization of the Carnegie Building in 1954.

By 1955, the Rich Electronic Computer Center—financed by the Rich Foundation, the State of Georgia, and the Georgia Tech Research Institute—was in operation.

On January 23, 1956, Van Leer died suddenly in an Atlanta hospital and Dean of Faculties Paul Weber was named acting president while the Regents searched for a successor. During Weber's 17 months in office, the Joint Research and Laboratory Building of the State Highway Department and Georgia Tech was dedicated (February 29, 1956) and the Alexander Memorial Building, financed by gifts from the alumni and friends of the school and by Radio Station WGST and the Georgia Tech Athletic Association, was dedicated (November, 1956).

Dr. Edwin D. Harrison became Tech's sixth president on August 15, 1957. On January 7, 1959, Tech's Radioisotopes and Bioengineering Laboratory was dedicated. The $500,000 building was financed by State funds, National Institutes of Health, and the Atomic Energy Commission which provided $250,000 worth of equipment.

In November of the same year, Tech accepted the $2,300,000 New Classroom Building which was financed by the University System Building Authority. The new Joseph Brown Whitehead Memorial Infirmary financed by the estate of Lettie Pate Evans, was dedicated on June 23, 1960. It was followed by five new dormitories which were dedicated in August, 1961. They were Field, Hanson, Hopkins, Matheson, and Perry. During May of 1962, Southern
Technical Institute's $2,000,000 campus near Marietta, funded by the State, the City of Marietta, and Cobb County, was dedicated.

In the summer of 1961, the new Physical Plant Building was opened. It was built with funds from the State as was the Crenshaw Field House, opened in the fall.

In January, 1962, the new $3,300,000 Electrical Engineering Building which was funded by the University System Building Authority was occupied by the School of Electrical Engineering. A year later, dedication services were held for the largest single building project in Tech history, the Frank H. Neely Nuclear Research Center which was supported by grants from the State of Georgia, the National Science Foundation, and national loans from the Atomic Energy Commission.

One major building still under construction on the campus is the new Chemical Engineering—Ceramic Engineering Building which should be completed in 1964. It was also financed by the University System Building Authority.
GENERAL INFORMATION

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 Aerospace, Ceramic, Chemical, Civil, Electrical, Industrial, Mechanical, and Textile Engineering; Engineering Mechanics; Applied Biology, Applied Mathematics; Applied Psychology; Architecture; Building Construction; Industrial Design; Chemistry; Physics; Industrial Management; Textile Chemistry; 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.

ADMISSION REQUIREMENTS

Application for admission forms will be provided by the Director of Admissions on request. Completion of all application forms and of all requirements contained therein is required of each applicant before his request for admission can be considered. No application will be considered unless received at least twenty days before registration day.

The Institute reserves the right to refuse to accept applications at any time when it appears that students already accepted for the quarter which the applicant wishes to enroll will fill the Institute to its maximum capacity. The Institute also reserves the right to reject an applicant who is not a resident of the State of Georgia.

FRESHMEN

The Georgia Institute of Technology has two different sets of requirements insofar as high school units are concerned: one for students planning to major in engineering or science (Group I), and one for those planning to major in architecture, industrial management, or textiles (Group II).

<table>
<thead>
<tr>
<th>Group I (Engineering or Science)</th>
<th>Group II (Arch., I.M., Textiles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>English</td>
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<tr>
<td>Algebra</td>
<td>Algebra</td>
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<tr>
<td>Plane Geometry</td>
<td>Plane Geometry</td>
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<tr>
<td>Trigonometry</td>
<td>History</td>
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<tr>
<td>Advanced Algebra</td>
<td>*Science</td>
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<tr>
<td>History</td>
<td>Optional Units</td>
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<td>Optional Units</td>
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</tbody>
</table>

*Science units may be met with courses in General Science, Biology, Chemistry and/or Physics.
Optional Units

<table>
<thead>
<tr>
<th>Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Solid Geometry</td>
<td>1/2</td>
</tr>
<tr>
<td>Trigonometry</td>
<td>1/2</td>
</tr>
<tr>
<td>Advanced Algebra</td>
<td>1 to 3</td>
</tr>
<tr>
<td>History and Civics</td>
<td>1 to 3</td>
</tr>
<tr>
<td>Economics</td>
<td>1/2 to 3</td>
</tr>
<tr>
<td>Latin or Greek</td>
<td>1 to 4</td>
</tr>
<tr>
<td>German, French, or Spanish</td>
<td>2 to 4</td>
</tr>
<tr>
<td>Biology</td>
<td>1/2 to 1</td>
</tr>
<tr>
<td>Chemistry</td>
<td>1/2</td>
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<tr>
<td>General Science</td>
<td>1/2</td>
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<tr>
<td>Physics</td>
<td>1/2</td>
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<tr>
<td>Activities</td>
<td>1/2</td>
</tr>
<tr>
<td>Drawing</td>
<td>1/2</td>
</tr>
<tr>
<td>Commerce</td>
<td>1 to 3</td>
</tr>
<tr>
<td>Shop Work</td>
<td>1/2</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1 to 2</td>
</tr>
<tr>
<td>Military</td>
<td>1/2</td>
</tr>
</tbody>
</table>

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

Special attention is called to the required one-half unit in advanced algebra in Group I. Suggested topics to be included in this course include the following: the system of real numbers, functions, complex numbers, theory of equations, systems of equations, permutations, combinations, and the binomial theorem. More detailed information regarding these suggested topics may be secured on request. Solid geometry is not an acceptable substitute for this algebra requirement but honors programs or other advanced courses including mathematical analysis or analytic geometry will be acceptable.

The Institute reserves the right to reject the credits from any high school or other institution notwithstanding its accredited status, where the Institute determines from investigation that the quality of instruction available at such high school or institution is for any reason deficient or unsatisfactory.

In addition to the scholastic units mentioned above, Georgia Tech uses the following criteria to judge its high school applicants:

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

(2) The applicant must take the College Entrance Examination Board Tests. All applicants must take the Scholastic Aptitude Tests and the Achievement Tests in English and mathematics (intermediate or advanced). In addition those students planning to major in engineering or science (Group I) must take the Achievement Test in either chemistry or physics.

(3) All applicants must be at least 16 years of age and of established good moral character. The Institute reserves the right to examine and investigate the moral worth, character, and personality of the applicant.

(4) The applicant must have a predicted grade-point average which indicates that he has the potential to pursue effectively the educational program of the Institute.

Each applicant will be required to take a physical examination and forms for this purpose will be sent with the notice of acceptance. (Additional information regarding physical examinations may be found on page 29.)
Each accepted applicant for admission to the fall quarter is required to make a deposit of $25.00 within two weeks after notification of acceptance has been issued. (Additional information regarding this and other fees may be found on page 28.)

**Honors Programs for Freshmen**

Well-qualified freshmen are invited to participate in honors programs in chemistry, English, German, and mathematics. Participation is voluntary, but those who are eligible are urged to take advantage of the opportunity. Eligibility is determined in different ways for the four programs but in general by considering some combination of the scores made on the aptitude and achievement tests of the College Entrance Examination Board together perhaps with the high school record. A student does not have to major in a particular department in order to participate in its honors program. Some of the programs provide both advanced standing and enrichment; others, enrichment only. Further details may be obtained from the departments who administer the programs.

**Admission by Examination**

An applicant with sixteen or more units or their equivalent who is not eligible for admission by certificate, but who meets all other requirements, may qualify for admission by passing examinations in English, mathematics, and chemistry or physics, or by satisfactorily completing remedial and refresher courses in these subjects.

Entrance examinations are normally held on the campus. 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.

**Mathematics Credit by Examination**

Matriculating freshmen who do not qualify for the Honors Program in mathematics (see page 133) may nevertheless have had special mathematical training in high school. If they can show to the satisfaction of the School of Mathematics that they have had such training and if their previous test scores (Scholastic Aptitude, etc.) are high enough, they may take an examination for advanced standing from 6:00 to 9:00 p.m. on the first day of classes. Arrangements to do so must be made with the School of Mathematics at least twenty-four hours in advance. The examination will not normally be given at any other time in the fall quarter. Transfer students who have had training which cannot be accepted without further validation may also apply to the School of Mathematics for an examination at the same hour. Such applications must also be made at least twenty-four hours in advance.

**TRANSFER STUDENTS**

Applicants who have made satisfactory records in scholarship and in conduct at other colleges may be considered for admission with advanced standing.

Transfer students wishing to enter the School of Architecture are generally confronted with a difficult problem because of the highly specialized nature of the curriculum in this school (starting with the first quarter of the freshman year). These specialized courses may not ordinarily be obtained in other colleges unless in a School of Architecture.
(1) All regulations applicable to students entering college for the first time shall be applicable to students transferring from other colleges, insofar as the regulations are pertinent to the applications of transfer students.

(2) A student transferring from another college shall ask the Registrars of the colleges that he has previously attended to send official transcripts to the Director of Admissions. A transcript of high school work is not ordinarily needed but may be required in certain cases.

(3) The Institute reserves the right to deny admission to any transfer student when, in the opinion of the Director of Admissions, the academic standards or the admission procedures of the institution(s) previously attended are not equivalent or comparable to those existing at this institution.

(4) Courses completed in other colleges must have an over-all average of “C” or better and grades must be satisfactory for the last term prior to transferring. Credit for specific courses will not be allowed unless grades received are above the lowest passing grade. It is ordinarily impossible to give an official statement regarding transfer credit without having an interview with the applicant.

(5) Courses used as credits for a degree must have been completed in a period of ten years, counted from the time the first credits were acquired until the time all requirements for the degree have been met. Courses not falling within this time limit may be validated by examination. Transfer students should realize that credits six years (or more) old at the time of transferring are in danger of being voided by this regulation.

(6) The basic policy regarding the acceptance of courses by transfer is to allow credit for courses completed with satisfactory grades in other accredited colleges providing the courses correspond in general in time and content to courses in the curriculum they expect to enter at the Georgia Institute of Technology.

(7) Transfer students must take the College Entrance Examination Board Achievement Tests in English composition, advanced mathematics, and either chemistry or physics. (Applicants for Architecture, Industrial Management, or Textiles, may omit the test in chemistry or physics.) Candidates for admission to the fall quarter should plan to take the required Achievement Tests at the May date. Other standardized aptitude tests and/or achievement tests may be required prior to admission. The tests required will depend upon the level at which the transfer is being made and the program which the applicant desires to enter.

(8) Transfer students must comply with such other procedures, including personal interviews and psychological or other tests, as may be necessary to determine the applicants sense of social responsibility, adjustment of personality, sturdiness of character, and general fitness for admission to the Institute.

TRANSIENT STUDENTS
A student who has taken work in another college or university may apply for the privilege of temporary registration in the Georgia Institute of Technology. Such registration is generally for the summer quarter and the student will ordinarily be one who expects to return to the institution in which previously enrolled.
(1) An applicant for admission as a transient student must present a statement from the Dean or Registrar of the institution that he last attended stating that the student is in good standing. A transcript is not ordinarily required.

(2) An applicant will be accepted as a transient student only when it appears that the applicant's previous academic work is of a satisfactory or superior quality. The Director of Admissions shall have the right to require the applicant to submit a transcript of his previous college work.

(3) The Director of Admissions must have evidence that the institution the student previously attended was an accredited or approved institution.

(4) Even though the institution that the student last attended is accredited, the Director of Admissions may reject the application if he has reason to believe that the quality of the educational program of the institution that the applicant last attended is mediocre or unsatisfactory.

(5) In case of doubt about the qualifications of an applicant who seeks admission as a transient student, the Director of Admissions may classify the applicant as a transfer student and require the applicant to comply with all regulations regarding the admission of transfer students.

(6) Applicants for admission as transient students are not normally required to take the College Entrance Examination Board Tests.

(7) Since the primary obligation of the Georgia Institute of Technology is to its regularly enrolled students, it will consider the acceptance of transient students only when the acceptance will cause no hardship or inconvenience to the Institute or its regularly enrolled students.

GRADUATE STUDENTS
All correspondence relative to admission to graduate study should be directed to the Dean of the Graduate Division. Necessary application forms may be obtained from his office. These forms, together with letters of recommendation and official transcripts of previous academic work, should be on file in the office of the Dean at least four weeks before the beginning of the quarter for which the applicant plans to register if he is to be assured consideration for acceptance. The Graduate Bulletin may be obtained on request.

AUDITORS
A regularly enrolled student at the Georgia Institute of Technology may be permitted to audit a course providing permission is obtained from the instructor in charge of the course and the student's College Dean. The audited course will count at one-half value in computation of the student's schedule load. A student auditing a course will not be placed on the rolls, and no report will be made to the Registrar.

Members of the faculty or staff of the Georgia Institute of Technology may audit a course providing permission is obtained from the Department concerned and the Registrar.

SEMINARS, SHORT COURSES, AND INSTITUTES
Applicants seeking admission to seminars, short courses, and institutes with programs of work that carry academic credit shall be required to meet all requirements prescribed for admission of students to undergraduate or graduate programs of work.
Applicants who wish to enroll in non-credit seminars, short courses, and institutes shall present evidence to prove:

1. That the applicant has the educational background and the ability to pursue successfully the program of work that he or she wishes to take.

2. That the applicant is of good moral character; that he or she possesses a sense of social responsibility, and that he or she has a capacity for growth and development in the program for which he or she seeks admission.

In the case of an applicant who is seeking admission to a non-credit seminar, short course, or institute, the Georgia Institute of Technology shall have the right to prescribe the types of evidence that an applicant must submit in order to establish qualifications for admission.

**IRREGULAR STUDENTS OR SPECIAL STUDENTS**

Irregular students and special students shall be required to meet all requirements prescribed for admission to undergraduate or graduate programs of work as the case may be and to meet any additional requirements that may be prescribed by the Institute.

**INSTITUTE POLICIES REGARDING ADMISSIONS**

When the application, necessary transcripts, College Board scores, and any other required information on an applicant are found to be complete and in order, the applicant will be evaluated in terms of his test scores and grades, scholastic aptitude, social and psychological adjustment, and the probability of his completing the requirements for the desired degree. The Institute reserves the right, in every case, to reject any applicant whose general records and attitude do not indicate a probability of success in college in the Institute environment, notwithstanding the satisfaction of other requirements. Applicants must comply with such other procedures, including personal interviews and psychological or other tests, as may be necessary to determine the applicants' sense of social responsibility, adjustment of personality, sturdiness of character, and general fitness for admission to the Institute.

In order that the appraisal of a student's ability and fitness for college work may be as nearly accurate as possible, officials of the Institute will study carefully all the information, including biographical data that is submitted by the applicant. The officials of the Institute shall have the right to require each applicant for admission to appear for an interview before his application is finally accepted or rejected. If an interview is required, the Director of Admissions will notify the applicant of the time and place of which the interview will be conducted.

The ultimate decision as to whether an applicant shall be accepted or rejected will be made by the Director of Admissions, subject to the applicant's right of appeal as provided by the bylaws of the Institute and of the Board of Regents of the University System.
Admission of Women

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

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 six quarter hours in other subjects.

Residence Accommodations. See page 32. Due to the very limited residence hall facilities on the campus for women, incoming freshmen students should make reservations with the Housing Office as early as possible prior to registration.

College Entrance Examination Board Tests

During the academic year 1963-64, the College Entrance Examination Board will hold tests on each of the following dates: December 7, 1963, January 11, March 7, May 2, and July 8, 1964.

The Bulletin of Information obtainable without charge from the College Entrance Examination Board, contains rules regarding applications, fees, reports, and the conduct of the tests; lists of examination centers; and an application blank bound in. This application blank may be used for any College Board examination.

Candidates applying for examination should write to College Entrance Examination Board, P. O. Box 592, Princeton, N. J., or P. O. Box 27896, Los Angeles 27, Calif. Each application submitted for registration must be accompanied by the appropriate examination fee. All applications and fees should reach the appropriate office of the Board at least 30 days before the examination date for those living in the United States, Canada, Alaska, Hawaii, The Canal Zone, Mexico, or the West Indies, and 60 days before for those in Europe, Asia, Africa, Central and South America, and Australia.

The Board will report the results of the tests to Georgia Tech and other institutions indicated on the candidates' applications. The college will in turn notify the candidates of the action taken upon their applications for admission. Candidates will not receive reports upon their tests from the Board.

Veteran's Program

Any veteran desiring to further his education under veterans benefits at the Georgia Institute of Technology should first be accepted as a student of Georgia Tech by the Director of Admissions. This acceptance has no direct connection whatsoever with the Veterans' Administration. After being accepted by Georgia Tech, the new veteran student must secure from the Registrar instructions on how to register on registration day. 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.

At least one month before entering Georgia Tech, the veteran should go in person to the nearest Veterans' Administration Office to make application under
the Public Law 894 (disabled veterans bill), or Public Law 550 (Korean Bill of Rights). He should carry with him photostatic and/or certified copies of separation papers. He should also furnish the Veterans' Administration with public record copy of marriage, if applicable. 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. Since the new veteran student must be in school for at least a month before being allowed to fill out his first monthly report for payment, he must not expect any money from the Veterans' Administration earlier than sixty days after he enters Georgia Tech as a veteran student.

The Georgia Institute of Technology is assisting the incoming veteran in his transition from the service to college. On the campus are a Co-ordinator of Veterans' Affairs, and administrative officials, located in the office of the Dean of Students, to counsel and aid the veteran student.

Public Law 634 provides a special type of educational assistance for sons and daughters of deceased veterans.

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 nine 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 700 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, Tennessee.
Davidson College—Davidson, North Carolina

Davidson College, founded in 1837 by Presbyterians, is a liberal arts college with an enrollment of about 900. 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 over 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 700, 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.

University of Georgia—Athens, Georgia

The University of Georgia is a unit of the University System of Georgia and the College of Arts and Sciences participates in the 3-2 plan. Further information is available from the Dean of the College of Arts and Sciences.

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 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 a school in the United States. International students whose native language is Spanish are urged to enroll in the special, non-credit, intensive review course in English which is offered by the Department of Modern Languages each summer. Classes are limited to 15, and the minimum enrollment required for establishing a class is 10. Inquiries concerning this special course should be addressed directly to the Department of Modern Languages. If after beginning your studies 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 applica-
tion, 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.

(5) The applicant must submit the results of College Entrance Examination Board Tests. All applicants must take the Scholastic Aptitude Tests and the Achievement Tests in English and mathematics (intermediate or advanced). In addition those students planning to major in engineering or science (Group I) must take the Achievement Test in either chemistry or physics.

International students will only be accepted for initial admission to Fall Quarter classes starting in September.

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.

**Definition of Legal Residence**

To be considered a bona fide legal resident of Georgia for the purpose of registering at an institution of the University System of Georgia a student must establish the following facts to the satisfaction of the registering officer:

a. A student who is under 21 years of age at the time he seeks to register or re-register at the beginning of any quarter will be accepted as a resident student only upon a showing by him that his supporting parent or guardian has been legally domiciled in Georgia for a period of at least twelve months immediately preceding the date of registration or re-registration.

b. In the event that a bona fide legal resident of Georgia is appointed as the guardian of a non-resident minor, such minor will not be permitted to register as a resident student until the expiration of one year from the date of the appointment, and then only upon proper showing that such appointment was not made to avoid the non-resident fee.

c. If a student is over 21 years of age, he must show that bona fide residence in Georgia was established at least one year prior to the registration date. Any period of time during which a person is enrolled as a student in an educational institution in Georgia may not be counted as a part of the year's residence herein required when it appears that the student came into the State and remained in the State for the primary purpose of attending a school or college.

**PLEASE NOTE:** In order to avoid delay and inconvenience upon arrival for registration, if there is any question in your mind concerning your residence status, application for clarification should be made immediately or not later than two weeks prior to the registration date. Applications should be addressed to Residence Committee, Office of the Controller, Georgia Institute of Technology, Atlanta, Georgia.
Tuition and Fees

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

<table>
<thead>
<tr>
<th>Matriculation Fee per Quarter</th>
<th>Tuition Fee per Quarter</th>
<th>Student Activity Fee per Quarter</th>
<th>Medical Fee per Quarter</th>
<th>Total Fees per Quarter</th>
<th>Total Fees per Academic Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents of Georgia—</td>
<td>$80.00</td>
<td>none</td>
<td>$11.00</td>
<td>$12.00</td>
<td>$103.00</td>
</tr>
<tr>
<td>Non-Residents of Georgia</td>
<td>80.00</td>
<td>130.00</td>
<td>11.00</td>
<td>12.00</td>
<td>233.00</td>
</tr>
</tbody>
</table>

NOTE: (a) An extra fee may be charged in special courses.
(b) A deposit of $25.00 (in addition to the $25.00 dormitory room deposit mentioned on page 31) is required of each accepted applicant for admission to the Fall Quarter within two weeks after notification of acceptance has been issued. After enrollment, this fee will be credited to the student’s fee account. If the applicant decides not to enter, he may be refunded his deposit by application to the Director of Admissions not later than 30 days before the opening of the Fall Quarter. Thereafter, the deposit is forfeited except for instance of an act of Providence.
(c) Any student who withdraws during the first quarter of his attendance shall have his admission deposit deducted before any computation is made of the refund to which he may be entitled.

Summary of Expenses

(Estimated for Academic Year)

<table>
<thead>
<tr>
<th>Resident of Georgia</th>
<th>Non-Resident of Georgia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matriculation, Tuition and Fees</td>
<td>$309.00</td>
</tr>
<tr>
<td>Board, Room, and Laundry</td>
<td>800.00</td>
</tr>
<tr>
<td>R.O.T.C. Uniform (if required)</td>
<td>75.00</td>
</tr>
<tr>
<td>Books and Equipment</td>
<td>100.00</td>
</tr>
<tr>
<td><strong>Total for Academic Year</strong></td>
<td><strong>$1,284.00</strong></td>
</tr>
</tbody>
</table>

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.

**Student Motor Vehicles**

No freshman living within the defined campus area will be permitted to operate any motor vehicle unless given special permission by the Dean of Students in case of extreme hardship. No freshman or sophomore living within the defined campus area will be allowed campus parking privileges.

Any student (day, evening, graduate, or co-operative) who drives a vehicle to the campus must register it for either ON CAMPUS or OFF CAMPUS parking. ON CAMPUS registration will allow student parking in designated institutionally-owned areas. OFF CAMPUS registration will allow student parking in areas not institutionally controlled nor restricted.

An annual registration fee of $6.00 must be paid to register each vehicle for ON CAMPUS parking. This fee is applicable regardless of which quarter the vehicle is registered and will cover an entire academic year from September until registration the following September.

Freshmen and upperclassmen granted student parking permits are required to observe all parking regulations on the campus. The Georgia Institute of Technology reserves the right to limit in any way whatsoever the issuance of student parking privileges at the beginning of any quarter.

**Physical Examinations**

Entrance physical examination forms are mailed to students with the notice of their acceptance for enrollment. These forms are to be completed by the prospective student and his personal physician and mailed to the Director of Health in sufficient time to be received prior to the date of initial registration. After review of the medical history and physical examination report, the school physicians determine the assignments to ROTC and physical training. Any student who desires special consideration because of mental or physical disability should have his physician write an explanatory letter to the Director of Health giving full details of the disability and any desired limitations on physical activity. This letter is to be attached to the physical examination form. Any special examinations or reports needed to determine eligibility for enrollment
or assignment are at the expense of the student, not the school. Any student who fails to submit the required physical examination and immunization record prior to registration will have the examination ordered by the school at the expense of the student.

**ROTC**

All male 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 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.

Each applicant for formal enrollment in the basic course of the Air Force, Army of Navy ROTC shall be required to execute a Certificate of Loyalty Oath in such form as shall be prescribed by the Secretary of Defense.

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. However, not more than 9 hours of advanced ROTC may be used as elective credit towards a degree. 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 equalling in credit hours the ROTC work from which he is exempt. However, in no case must such a student elect more than six hours of additional subjects. Veterans with at least 6 months active duty may receive credit toward a degree for ROTC courses for which exempted.

For further details regarding the Army ROTC, see page 149, the Naval ROTC, see page 164, and for Air ROTC, see page 43.

**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 probably 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.

Any student who is not eligible for the ROTC deferment may apply for a II-S deferment (student deferment) when he is classified or ordered for a physical by his local board.
Dormitory Accommodations

It is Institutional policy to require all single freshmen, men and women, who do not reside with their parents, near relatives, or bona fide guardians, to live in the dormitories. All Freshmen are given FIRST PRIORITY in making dormitory assignments, as follows:

1st Priority—Freshmen
2nd Priority—Sophomore
3rd Priority—Junior
4th Priority—Senior
5th Priority—Night School Students and Co-ops on work period

TRANSFER STUDENTS will be placed according to class status, as above. (Class status should not be taken for granted, as this is determined after credits have been evaluated by the Registrar’s Office.) Sophomore classification requires 50 acceptable credit hours.

GRADUATE STUDENTS are placed in a reserved section of Matheson Dormitory. In addition, a limited number of single rooms are available for graduate students, on a first come — first serve basis, in Harrison and Howell Dormitories.

FRESHMEN and SOPHOMORE dormitories consist of BROWN, CLOUDMAN, GLENN, HARRIS, HARRISON, HOWELL, SMITH, and TOWERS, rent is $75.00 per quarter. (Limited number single rooms in Harrison and Howell reserved for Graduate Students.) TECHWOOD is reserved for students in the Co-operative Plan — rent is $75.00 per quarter. Junior and Senior dormitories (all double rooms) consist of FIELD, HANSON, HOPKINS, MATHESON and PERRY, rent is $85.00 per quarter. (One section of Matheson Dormitory reserved for Graduate Students.)

Each Georgia Tech dormitory is staffed with: a mature Graduate Student as Resident Advisor, who is assisted by a Senior Counselor and a staff of upperclass Student Counselors, who advise and counsel student residents. The dormitory organization and operation is intended to express the individual student’s personal responsibility for the development of social competence, the values of group living and practice in democratic processes, the elevation of scholastic standards and the fostering of a high academic atmosphere.

The Dormitories provide housing for 2,738 students. Most of the rooms accommodate two students. There are a few three-man rooms, also some 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. However, your application is for accommodations in the Dormitories and NOT for a specific room or roommate.

Changes between dormitories are not permitted after registration day. However, room changes may be made within the dormitory, to which assigned PROVIDED the change has been APPROVED by the Resident Advisor of that dormitory and then officially arranged in the Housing Office BEFORE the change is made.

All rooms are equipped with beds, study desks, dressers, clothes locker, book cases, chairs, mirrors and waste baskets. The student should provide himself with a mattress pad or cover, blankets, bedspreads, sheets (39” fitted), pillow and pillow cases, towels, and a good study lamp.

Dormitory regulations prohibit the installation and use of such electrical appliances as hot-plates, toasters, irons, coffee makers, heaters, radio transmit-
ters and television. The only electrical appliances permitted are electric razors, radios, clocks and a fan not to exceed 2.5 amp. power rating.

DORMITORY APPLICATIONS should be sent to the Controller’s Office. The Registrar will supply the necessary blank when you receive your Notification of Acceptance.

A $25.00 Room Deposit (in addition to the admission deposit mentioned on page 28) must be returned with the dormitory application. No dormitory application will be honored except when accompanied by the required deposit. This deposit may be refunded at the end of the school year, or at such time a student leaves school, provided the resident checks out properly, the key is returned, and there is no damage for which a resident is responsible. The refund must be requested, it is not automatically refunded.

ASSIGNMENTS: Dormitory Room Assignments are mailed a minimum of forty (40) days prior to the first day of registration, for the quarter applied for. Those applying after the beginning of this 40-day period, will receive a room assignment, as available, and be held responsible for acceptance. If it is too late to mail the assignment, it may be secured at the Housing Office upon arrival at Tech.

THE HOUSING OFFICE will send instructions as to shipment of baggage and other information with the Room ASSIGNMENT.

CANCELLATIONS: If, for any reason, the Dormitory application, or an assignment to a room, is to be cancelled, it should be done as soon as possible. If Notification of Cancellation is not received in the HOUSING OFFICE at least thirty (30) days PRIOR to the first day of registration, the $25.00 Room Deposit is forfeited.

A receipt for the key and security deposit will be promptly returned to the student, along with helpful preliminary instructions. Dormitory keys are issued at the Key Office in Smith Dormitory.

DORMITORY RENT is payable 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 two (2) 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 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 dollars ($8.00).

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

Residents once having paid rent, will receive no refund of room rent should they decide to move from the dormitories during any given quarter, UNLESS disenrolling from school in good standing.

COED DORMITORY ACCOMMODATIONS: The Girls’ Dormitory, located at 171 Fifth St., N. W., has six bedrooms, two baths, a large living room and a study room. Quarterly rent is $90.00. The housemother lives in the dormitory at all times, and she will make your room assignment upon your arrival.
The $25.00 deposit is refundable upon request at the end of the school year, or at such time a student may leave school, provided the key is turned in and there is no damage for which she is responsible.

Any student who withdraws from school and is in good academic and disciplinary standing should receive a dormitory rent refund in accordance with the Institution tuition refund policy.

Any student who moves from a dormitory to an apartment, fraternity house, private home, or is removed from the dormitory for disciplinary reasons, or leaves the Institution without proper notification should not receive a room rent refund and should forfeit his room deposit.

**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 reassigned according to the date of application in the following order: 1. Freshmen, 2. Sophomores, 3. Juniors, 4. Seniors, 5. Graduate Students.

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**
Cafeteria style food service is offered at Brittain Dining Hall. Here you have a wide choice of foods. The cost of the meal is determined by the items and quantity selected.

The “T” Room and O.D.K. Room are open for lunch and dinner with restaurant-style food service. A great many students prefer this relaxed dining atmosphere.

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.

**Public Relations and Placement**
The Department of Public Relations is a service organization handling public relations, placement, press relations and publications.

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.

In regard to publications, the Office of Publications is responsible for publishing all official publications of both the Institute and the Engineering Experiment Station.

**Other Information**
*Class Attendance:* Students are expected to attend all of the classes on their official schedules unless exemptions are granted under specific provisions of the Student Rules and Regulations. Students may be dropped from the class
rolls in any course when they neglect their studies to the extent that they cannot possibly earn credit in the course. No fees are refunded under such circumstances.

**Examinations and Grade Reports:** Final examinations are scheduled during the last week in each quarter and reports of the student’s academic progress are issued after the close of the quarter.

**Constitution and History Examinations:** A Georgia law, amended March 4, 1953, requires all students to pass examinations on United States and Georgia history and the United States and Georgia constitutions or pass comparable courses before graduation. Courses which may be substituted for the United States and Georgia constitutions examination are S.S. 113 or S.S. 323; courses which may be substituted for the United States and Georgia history examination are: S.S. 319, S.S. 324, S.S. 325, S.S. 327, or S.S. 328.

**Limitations on credit for ROTC courses:** Twelve (12) quarter hours in Basic ROTC courses and nine (9) quarter hours in Advanced ROTC courses is the maximum credit allowed toward meeting the requirements for any degree.

**Grading System:**
- **A**—excellent (4 quality points)
- **B**—good, above average (3 quality points)
- **C**—satisfactory (2 quality points)
- **D**—unsatisfactory, but passing (1 quality point)
- **F**—failure, must be repeated if in a required course (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 grade of D is passing in a single subject but a general average of C is required for graduation.

More detailed information regarding the academic regulations of the Institute is contained in the handbook of student rules and regulations which is available to all students in the Publications Office.

**Curricula**

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

At least 24 credit hours of humanities and social science must be included in all curricula leading to an undergraduate degree. The following courses have been approved as meeting this requirement:

- **I.M.** 201, 202, 203, 204, 486, 487, 490.
- **Music** 201, 202, 203.
- **Psy.** 303, 304, 402, 410.

From time to time additional courses may be added to this list.
School of Aerospace Engineering

(Daniel Guggenheim School of Aeronautics)
(Established in 1930)


General Information

The School of Aerospace Engineering includes the Daniel Guggenheim School of Aeronautics that was established in 1930, by a gift from the Guggenheim Foundation, to establish opportunities at the Georgia Institute of Technology for study and research of the highest order in the field of aeronautics. The inclusion of space in the name indicates the broadening of the school’s activities into this area. The scope of the work extends from the field of hydrodynamics to the area of rarified gasdynamics and the design of vehicles to operate in the oceans, in the air, or in outer space. The rapidly expanding fields of aircraft and missile aerodynamics; high temperature phenomena both in the gasdynamics field and the structural dynamics and materials field; propulsion; and aircraft, missile and space vehicle design make the courses in aerospace engineering especially significant.

The number of students accepted as candidates for the Aerospace Engineering degree is limited. The selection will be made at the beginning of the junior year on the basis of the student’s ability as demonstrated during his previous two-years’ work.

Satisfactory completion of the four-year curriculum leads to the degree Bachelor of Aerospace Engineering. Students with marginal background preparation will probably find it necessary to spend more than twelve quarters. It is usually possible for applicants who already possess the degree of Bachelor of Science in Mechanical, General, Electrical, or Civil Engineering to complete the additional work toward the degree of Bachelor of Aerospace Engineering in one additional year if they so desire.

The School offers work leading to both the Master of Science degree and the Doctor of Philosophy degree and these programs prepare the student for research, high-level design, or teaching.

Equipment

The School of Aerospace Engineering 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 three buildings; a three-story structure, erected in 1930; a one-story temporary annex, completed in 1947; and a new two-story permanent annex, completed in 1957. The principal building contains, in addition to classrooms and offices, a nine-foot wind tunnel, a 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 aerospace 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 low turbulence wind tunnel. The permanent annex houses the expanded compressible flow laboratory including a water table, smoke flow tunnel, supersonic wind tunnel, and the associated air compressors, dryers and storage tanks.

**Freshman Year**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<tr>
<td>Chem. 101-2-3</td>
<td>Inorganic Chemistry</td>
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<td>Eng. 105</td>
<td>Introduction to Literature</td>
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<td>Math. 100</td>
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<td>P.T. 101-2-3</td>
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**Sophomore Year**

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<tr>
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<td>Aerodynamics of the Airplane</td>
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<td>Eng. 201-2-3</td>
<td>Survey of the Humanities</td>
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<td>Math. 202-3</td>
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<td>Math. 304</td>
<td>Differential Equations</td>
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<td>M.E. 207</td>
<td>Engineering Materials and Processes</td>
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<td>Mech. 305</td>
<td>Statics</td>
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<td>Phys. 207-8-9</td>
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**NOTE:** Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

*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.

**For course numbers, see the course descriptions under the appropriate ROTC sections in this Bulletin.**
### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
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<tr>
<td>A.E.</td>
<td>325</td>
<td>Aero and Hydro Mechanics</td>
<td>3-0-3</td>
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<tr>
<td>A.E.</td>
<td>331</td>
<td>Theory of Structures I</td>
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<td>3-0-3</td>
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<tr>
<td>A.E.</td>
<td>421</td>
<td>Aerodynamics—Elementary Supersonics</td>
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<td>A.E.</td>
<td>424</td>
<td>Aerodynamics—Perfect Fluids</td>
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<td>Theory of Structures II</td>
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<td>E.E.</td>
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<td>Advanced Engineering Mathematics</td>
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<td>M.E.</td>
<td>322-23</td>
<td>Thermodynamics</td>
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<td>Dynamics</td>
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<td>Phys.</td>
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<td>A.E.</td>
<td>323</td>
<td>Aerodynamics of the Airplane II</td>
<td>3-0-3</td>
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<td>A.E.</td>
<td>428</td>
<td>Experimental Methods</td>
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<tr>
<td>A.E.</td>
<td>435-37</td>
<td>Theory of Structures III, IV</td>
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<td>A.E.</td>
<td>440-41</td>
<td>Airplane Design I, II</td>
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<td>A.E.</td>
<td>457</td>
<td>Static and Dynamic Stability</td>
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<td>Seminar</td>
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<td>Mechanical Vibrations</td>
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<td>14-12-18</td>
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*NOTE: 1) At least 6 hours must be in the Humanities. See list on p. 34.
2) Not more than 9 hours of ROTC may be counted.
3) At least 9 hours must be selected from A.E. Electives list.
4) Remaining hours are free electives.
Courses of Instruction

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

A.E. 322. Aerodynamics of the Airplane, I.
3-0-3. Prerequisites: Math. 203 and Physics 209 or concurrently.

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.


A.E. 323, Aerodynamics of the Airplane II.

Drag; horsepower; basic performance; special performance problems; load factors and maneuvers; compressibility effects.


A.E. 325. Aero and Hydro Mechanics
3-0-3. Prerequisites: A.E. 322. Math. 412 or concurrently.

Fluid mechanics, hydrodynamics, including continuity, circulation and curl, irrotational flow, velocity potential, vortex theorems, Euler equations, momentum theory, Bernoulli equation.


A.E. 331. Theory of Structures I.

Basic theory of aircraft and missile structural design including: a review of plane stress and strain theory; loads, shears, and moments in wings and fuselages; inertia loads and load factors; section properties of aircraft components, space structures; bending of beams; materials properties and testing.

Text: Peery, *Aircraft Structures; Mil HNBK-5.*

0-9-3. Prerequisites: Third Quarter Junior or Senior Standing and approval of A.E. School Director.

A clearly stated program prepared by the student describing in detail the nature, purpose and scope of the proposed problem, carrying the endorsement of the sponsoring A.E. staff member, must be submitted to the A.E. School Director for approval. Library, experimental, or theoretical work will be considered.

Text: None.

A.E. 410. Thermal Stresses
3-0-3. Prerequisites: A.E. 435, or consent of instructor.

Origin of thermal stress; external constraints; determination of temperatures—the heat transfer problem; fundamental equations of uncoupled isotropic thermoelasticity; some solutions of typical thermoelastic problems; properties of materials at high temperatures; problems in creep analysis.


A.E. 415. Missile Aerodynamics

The aerodynamics of airborne missiles including slender body theory at subsonic and supersonic speeds. Wing-body-tail interference and ex-
tended study of drag with particular application to slender body configurations. Mathematical methods and general formulas are emphasized.

Text: To be selected. Staff.

A.E. 419. Hypersonic Flow
3-0-3. Prerequisite: A.E. 421.

General flow equations; the hypersonic similarity law; slender body theory; approximate methods; methods using shock and simple wave relations; leading edge bluntness effects.


A.E. 421. Aerodynamics—Elementary Supersonics
3-0-3. Prerequisites: A.E. 325, M.E. 322.

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

Text: Liepmann and Rosko, Elements of Gas Dynamics. Staff.

A.E. 424. Aerodynamics—Perfect Fluids
5-0-5. Prerequisites: A.E. 325, Math. 412.

Flow about a body; finite thickness airfoils and three-dimensional wing theory; complex variable theory; conformal mapping and transformations.

Staff.

A.E. 425. Wind Tunnel Laboratory
1-3-2. Prerequisites: A.E. 323 and A.E. 450.

Selected experiments in 2½ foot, 9-foot, low turbulence, and 2 x 6 inch supersonic tunnels. Use of various types of wind tunnel instrumentation will be stressed.

Text: Pope, Wind Tunnel Testing. Staff.

A.E. 426. Viscous Flow

A study of the momentum and energy equations as applied to viscous flows with applications. Boundary layer equations with applications.

Text: None. Staff.

A.E. 427. Wind Tunnel Design and Techniques
2-0-2. Prerequisite: A.E. 323.

Theory and design of wind tunnels and components, proper testing procedure.


A.E. 428. Experimental Methods
1-6-3. Prerequisites: A.E. 323, A.E. 457.

The methods, equipment, and instrumentation used in experimental aerospace engineering. The technique of recording and interpreting experimental data from selected laboratory tests is emphasized.

Text: None. Staff.

A.E. 430. Theory of Structures II.
3-3-4. Prerequisites: A.E. 331, Math. 412.

Stress relations for an arbitrary continuous body; strain-displacement and compatibility relations; introduction to the theory of isotropic elasticity; strain gages and strain measurements; illustrative elasticity solutions for beams; application to thin sheet-stringer aircraft structures; shear centers; unsymmetrical bending; tapered sections; shear flows in closed box beams.

Text: Peery, Aircraft Structures, and notes. Staff.

A.E. 435. Theory of Structures III.
3-3-4. Prerequisite: A.E. 430.

General discussion of strain energy in elastic structures; application
to rods, webs, beams, and shafts; virtual work and generalized virtual work; structural deflections by virtual work, Rayleigh-Ritz, and double integration; introduction to stability analysis; use of energy methods; long and short columns; elastic and plastic buckling of plates; the pure tension field beam; the semi-tension field beam.


Staff.

A.E. 437. Theory of Structures IV.
3-3-4. Prerequisite: A.E. 435.

Statically indeterminate structures by energy methods and special methods; torsion on multicell sections; elastic axis of multicell sections; elastic axis of wing sections, warping of box beams; correlation of theory and practice by experiments in laboratory.


Staff.

A.E. 439. Advanced Structures
3-0-3. Prerequisites: A.E. 435.

Detailed study of beam columns; shear webs with cut-outs; shear lag; bending in the plastic range; miscellaneous thin metal structural problems.


Staff.

A.E. 440. Airplane Design I.

Design of stressed skin type airplane in accordance with the U. S. Civil Aeronautics 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; ANC-5a Bulletin.

Staff.

A.E. 441. Airplane Design II.

Continuation of A.E. 440 to a stress of the basic wing components.

Text: Lecture notes; ANC-5a Bulletin.

Staff.

A.E. 442. Airplane Design III.
0-9-3. Prerequisites: A.E. 441 and A.E. 437.

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

Text: Lecture notes; ANC-5a Bulletin.

Staff.

A.E. 454. Dynamics of the Airplane
4-0-4. Prerequisites: A.E. 450, Mech. 421.

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.


Staff.

A.E. 456. Vibration and Flutter

Historical sketch, influence of aeroelasticity in designs of aircraft and missiles, matrices, structural dynamics, solution of wing divergence and flutter problems. Experimental considerations, lab demonstrations.


Staff.
A.E. 457. Static and Dynamic Stability
Airplane and missile static lateral and longitudinal stability and a study of the equations and methods used in the analysis of dynamic stability of airplanes and missiles.
Text: None. Staff.

A.E. 467-468. Seminar
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. Staff.

A.E. 471. Internal Aerodynamics
3-0-3. Prerequisites: A.E. 421, M.E. 323.
One dimensional, internal aerodynamics. Flow characteristics of wind tunnels, diffusers and exhaust nozzles. Flow in ducts with friction, energy change and mass addition.

A.E. 473. Introduction to Propeller and Rotor Theory
3-0-3. Prerequisites: A.E. 323 and M.E. 323.
A study of the theory and equations used in the design of propellers and helicopter rotors.
Text: None. Staff.

A.E. 481. Jet Propulsion
3-0-3. Prerequisite: A.E. 471
Text: Keenan, J. H. and Kaye, Jr., Gas Tables. Staff.

A.E. 482. Jet Propulsion and Rocketry
5-0-3. Prerequisite: A.E. 481.
Text: To be selected. Staff.

A.E. 495. Engineering Analysis
Introduction to programming for digital computer; numerical analysis for digital computation; problem solution on an analog computer; applications to problems in aerospace engineering. Students have the opportunity to work with both analog and digital computers.
Text: Notes. Staff.

Graduate Courses Offered

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<tr>
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<th>Title</th>
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<td>A.E. 615</td>
<td>Kinetic Theory of Gases</td>
<td>3-0-3</td>
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<tr>
<td>A.E. 621</td>
<td>Elements of Viscous Fluid Theory</td>
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<td>A.E. 622</td>
<td>Elements of Compressible Flow Theory</td>
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<td>A.E. 623</td>
<td>Theoretical Aerodynamics I</td>
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<td>A.E. 630</td>
<td>Elasticity</td>
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<td>A.E. 632</td>
<td>Advanced Structural Analysis II</td>
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<td>A.E. 633</td>
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<td>Aerodynamics of Aeroelasticity</td>
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<td>A.E. 659</td>
<td>Structural Dynamics of Aeroelasticity</td>
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<td>Aerodynamics of the Helicopter II</td>
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<td>Rocket Propulsion Principles I</td>
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<td>A.E. 681</td>
<td>Theory of Compressors and Turbines</td>
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<td>Jet Propulsion Principles</td>
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<td>A.E. 704,5,6 Special Problems in Aerospace (Credit to be arranged)</td>
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<td>Three-Dimensional Vortex Theory</td>
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<td>Turbulent Flow II</td>
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<td>Hypersonic Flow Theory</td>
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<td>A.E. 720</td>
<td>Dynamics of Perfect Fluids</td>
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<td>A.E. 727,728 Advanced Problems in Aerodynamics</td>
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<td>A.E. 755</td>
<td>Applied Aeroelasticity</td>
<td>3-0-3</td>
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<tr>
<td>A.E. 800</td>
<td>Doctor's Thesis</td>
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</tr>
</tbody>
</table>
Department of Air Science
(Established in 1950)


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 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.

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 training (between the junior and senior year), about $78. Cadets going to summer training receive compensation for traveling expenses for the round trip to an Air Force Base at five cents per mile. Cadets at summer training are furnished food, housing, uniform, medical and dental care.

Completion of the advanced course, including summer training and receipt of a college degree makes a cadet eligible for a commission as a second lieutenant in the United States Air Force Reserve. Cadets receiving commissions will be ordered to active duty shortly after graduation. The active duty requirement for those who enter and satisfactorily complete pilot training is four years after graduation from the flying school. For others, the requirement is four years after initial call to active duty.

Students who have successfully completed the basic course and who are
selected for further training may enroll in the advanced course. The advanced course is a recognized elective in all departments at Georgia Tech to the extent that nine hours of credit may be applied toward a degree providing the entire advanced course is completed. If the student does not complete the entire advanced program, ROTC credits may not be used as electives unless the student has been relieved of his contractual obligations by the Secretary of the Air Force.

**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.

Newly entering students in the Air Force ROTC are required to purchase a new uniform through Georgia Institute of Technology. The cost for the basic uniform is approximately $75.00. The advanced uniform costs $108.00.

A cadet receives reimbursement for the basic uniform while he remains enrolled in AFROTC at Georgia Tech. Upon completion of Freshman year he receives $25, and Sophomore year an additional $25.

A cadet who transfers to another institution prior to completion of the basic course will be governed by the gaining institution's uniform system as to whether or not he will receive reimbursement for the remainder of the basic course.

An additional $100 allowance is provided for the advanced cadet upon his completion of the course or upon discharge without prejudice.

**Texts**

Textbooks are furnished by the Air Force (except for those subjects of the regular curriculum which may be substituted in lieu of Air Force subjects).

**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. Final grades for each quarter will be based on evidence of those attributes combined with his academic standing.

**Academic Credit**

Academic credit is granted for the completion of Air Science courses as indicated in the sections that follow, however, not more than 9 hours in Advanced AFROTC courses may be applied toward a degree.

<table>
<thead>
<tr>
<th></th>
<th>1st Q.</th>
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<th>3rd Q.</th>
<th>Credit Hrs.</th>
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<td><strong>Total</strong></td>
<td></td>
<td></td>
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</table>
Courses of Instruction

NOTE: 2-1-2 means 2 hours class, 1 hour laboratory, 2 hours credit.

BASIC COURSE — Aerospace Age Citizenship Education

AIR SCIENCE I — Foundations of Aerospace Power.

A.S. 131—Laboratory
0-1-0.

Basic instruction and practice in military formation and drills. No outside preparation is required and no quizzes will be given. The grade of "S" will be given for satisfactory completion.

A.S. 132—Laboratory
0-1-0.

Continuation of A.S. 131 and in addition instruction and practice in parades, reviews and ceremonies. No outside preparation is required and no quizzes will be given. The grade of "S" will be given for satisfactory completion.

A.S. 133—Aerospace Power and its Vehicles
2-1-2.

A brief introduction to Air Force ROTC followed by study of the fundamentals of air power, to include military air power, research and development, civilian air industries, airlines and airways, and general aviation. The basic elements of aircraft and space vehicles are covered, with emphasis on theories of aerodynamics, guidance and propulsion.

AIR SCIENCE II — Foundations of Aerospace Power.

A.S. 231—The Evolution of Aerial Warfare and its Impact on National Security
2-1-2.

A study of the military policy of the United States emphasizing the current role of the Air Force in the Department of Defense. Weapon system developments and their affiliation based upon the principles of war, analyses of ground, naval and air warfare, and current concepts. This course also contains a brief presentation of the professional opportunities in the United States Air Force.

A.S. 232—United States Air Force Weapon Systems and Their Employment
2-1-2.

A continuation of studies of weapon systems, including consideration of conventional weapons, chemical, biological and thermo-nuclear weapons, aircraft, bases, missiles and personnel, followed by study of the conduct of air operations by the USAF, including political, diplomatic, and humanitarian considerations as well as combat operations. A study of space operations covering environment, vehicles, facilities, human and technical problems, current programs and future implications.

A.S. 233—Laboratory
0-1-0.

Continuation of previous laboratory work and in addition training in leadership, military customs and courtesies to develop cadet officers who can be given command responsibility for the administration and operation of the Cadet Wing during Advanced ROTC. No outside preparation is required and no quizzes will be given. The grade of "S" will be given for satisfactory completion.

NOTE: Before being eligible for the Advanced Course, each student must satisfactorily complete Air Science I and II. In addition, he must satisfactorily complete any two of the following courses during his Fresh-
man year and one of the remaining courses during his Sophomore year:

**ADVANCED COURSE — Air Force Officer Development.**

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

**A.S. 311—Air Force Commanding, Communicating, and Instructing**
4-1-3.

Principles and concepts of command and staff activities; air base functions; theories and fundamentals of human communicating, with media, channels and methods. Instructing as an officer responsibility, with elementary studies in field of education.

**A.S. 312—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. 313—Problem Solving and Military Justice**
4-1-3.

Techniques and concepts of modern problem solving; detailed study of principles of applied imagination. Basic authorities, rules, and fundamentals of military law, with policies and procedures of military courts and boards.

**AIR SCIENCE IV—Global Relations.**

**A.S. 411—Weather and Navigation**
4-1-3.

Operational factors encountered in flight; Command positions in leadership laboratory.

**A.S. 412—International Relations**
(See A.S. 422 and S.S. 347 below, given in lieu of A.S. 412)

**A.S. 422—Laboratory**
(Must be scheduled concurrently with Social Science 347)
0-2-0.

Air Force exercises designed to train senior cadets to perform as Commanders, staff officers, instructors, and supervisors, and to gain extensive understanding of the organization of the Air Force. No outside preparation is required and no quizzes will be given. The grade of "S" will be given for satisfactory completion.

**S.S. 347—Foundations of National Power and International Relations**
3-0-3. Prerequisites: Junior and Senior standing.

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 for S.S. 347: Haas and Whiting, *Dynamics of International Relations*. Mr. Roberds.

**A.S. 413—Military Aspects of World Political Geography; The Air Force Officer (Briefing for Commissioned Service)**
4-1-3.

The relationship of geographical factors to national strength and national policy. Preparation for active duty as an officer.
School of Applied Biology
(Established 1960)

Director—Robert S. Ingols; Professor-emeritus—Hugh A. Wyckoff; Professors—*Albert E. Cannon, Thomas W. Kethley; Associate Professors—Allen B. Eschenbrenner, Robert Fetner, Peter E. Gaffney, Carlyle J. Roberts; Assistant Professors—Edward L. Fincher, Evan Dwain Porter, Nancy W. Walls; Instructor—Ralph E. Sharp; Secretary—Mrs. Mildred H. Smead.

General Information

The purpose of the School of Applied Biology is principally to prepare students for a career in Biology with emphasis on the basic sciences and applications of Biology. The Biology courses in the curriculum stress the functioning of organisms as dynamic systems and the physical and chemical changes resulting from interaction with their environment. The intensity of the biological studies coupled with a broad background in the other sciences prepares the graduates for professional careers in Biology with employment opportunities in government (Public Health, or related medical fields, agriculture, space systems, food and drug) or in industry (pharmaceutical, food, fermentation).

Completion of the curriculum with the degree of Bachelor of Science in Applied Biology also prepares students who wish to continue their studies in graduate schools in advanced biological specialties or in medicine. Pre-Medical students have the guidance of a special committee of the faculty.

The School also offers programs leading to the Masters Degree in Public Health or Public Health Engineering.

Since the faculty are actively engaged in research in such fields as radiobiology, cytology, microbiology, aerobiology, limnology, waste treatment, and water pollution, student majors will be encouraged to realize the challenges and opportunities in these and related areas of interest.

In addition, the courses in the Biology curriculum are offered as an integral part of the broad technical background of students in the other sciences or engineering curricula at Georgia Tech.

*Retired.
Curriculum in Applied Biology

### Freshman Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
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<tr>
<td>Chem. 101-2-3</td>
<td>General Chemistry</td>
<td>3-3-4</td>
<td>3-3-4</td>
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<td>Draw. 105-5-5</td>
<td>Engineering Graphics</td>
<td>5-0-5</td>
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<tr>
<td>Eng. 101-2</td>
<td>Composition and Rhetoric</td>
<td>2-6-4</td>
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<tr>
<td>Eng. 105</td>
<td>Introduction to Literature</td>
<td>3-0-3</td>
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<tr>
<td>Math. 100</td>
<td>Algebra-Trigonometry</td>
<td>3-0-3</td>
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<td>Math. 104</td>
<td>Analytical Geometry-Calculus</td>
<td>3-0-3</td>
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<td>Math. 201</td>
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<td>S.S. 111-12-13</td>
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<td>P.T. 101-2-3</td>
<td>ROTC</td>
<td>3-1-2</td>
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<td>Gen. 101</td>
<td>Orientation</td>
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**Totals:** 18-14-20 17-8-18 17-8-18

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

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### Sophomore Year

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<td>3-3-4</td>
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<td>Bio. 307</td>
<td>Microbiology</td>
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<tr>
<td>Chem. 214-15</td>
<td>Analytical Chemistry</td>
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<td>Eng. 201-2-3</td>
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<td>Phys. 207-8-9</td>
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<td>3-1-2</td>
<td>3-1-2</td>
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</table>

**Totals:** 16-17-20 16-17-20 17-15-20

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### Junior Year

<table>
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<th>Course No.</th>
<th>Subject</th>
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<tbody>
<tr>
<td>Bio. 407</td>
<td>Bacteriology or</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<td>Bio. 203</td>
<td>Comparative Anatomy</td>
<td>3-0-3</td>
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<tr>
<td>Bio. 334</td>
<td>Biostatistics</td>
<td>3-0-3</td>
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<tr>
<td>Chem. 340-1-2</td>
<td>Organic Chemistry</td>
<td>3-0-3</td>
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<td>Chem. 343-4-5</td>
<td>Organic Chem. Lab.</td>
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<td>M.L. *</td>
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<td>S.S. 111-12-13</td>
<td>Social Science</td>
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<td>Psych. 303-4</td>
<td>General Psychology</td>
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<td>Electives **</td>
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**Totals:** 12-9-19 12-9-19 11-16-19

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

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**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.**

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

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**If Modern Language was taken during Freshman year, then Social Science shall be scheduled during the Junior Year or vice-versa.**

**Not more than 9 hours of Electives in the Junior and Senior Years may be advanced ROTC. The remaining electives must be chosen from acceptable courses in Biology, Mathematics, Physics, Chemistry, Chemical Engineering, or Civil Engineering. The courses must be chosen in conference with a staff advisor to provide a sequence or group of courses which is interrelated to a specific field of interest.**
Senior Year

<table>
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<tbody>
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<td>Bio. 415</td>
<td>Radiation Biology</td>
<td>3-6-5</td>
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<tr>
<td>Bio. 431</td>
<td>Microscopy</td>
<td>3-0-3</td>
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<tr>
<td>Bio. 435-6</td>
<td>Applied Biology</td>
<td>3-3-4</td>
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<td>Bio. 440-1-2</td>
<td>General Physiology</td>
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<td>0-0-11</td>
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<td>9-9-18</td>
<td>5-6-18</td>
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*Not more than 9 hours of Electives in the Junior and Senior Years may be advanced ROTC. The remaining electives must be chosen from acceptable courses in Biology, Mathematics, Physics, Chemistry, Chemical Engineering, or Civil Engineering. The courses must be chosen in conference with a staff advisor to provide a sequence or group of courses which is interrelated to a specific field of interest.

Courses of Instruction

**Bio. 201. Introduction to Biology**

3-3-4. Prerequisite: None.

Fundamental principles and theories of biology. Study of cells and the plant kingdom.


**Bio. 202. Introduction to Biology**

3-3-4. Prerequisite: Bio. 201.

Study of invertebrate and vertebrate animal forms.


**Bio. 203. Comparative Anatomy**


Study of the comparative anatomy of the vertebrates with laboratory dissection of several vertebrate forms.

Text: To be selected. Staff.

**Bio. 204. Introduction to Biology**


A review of animal physiology and the various disciplines in Biology.


**Bio. 307. General Bacteriology**

3-4-4. Prerequisite: Bio. 201.

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.


Mr. Gaffney.

**Bio. 316. Industrial Hygiene**

3-0-3. Prerequisite: None.

Problems of health in industry; industrial poisons, occupational hazards and diseases, industrial fatigue, ventilation, and accident prevention.

Text: Cannon, *Outline of Industrial Hygiene*.

References. Mr. Eschenbrenner.

**Bio. 333. Biostatistics**

3-3-4. Prerequisites: Math. 201, Bio. 204.

An introduction to statistical methods and their use in the preparation and interpretation of biological experiments.


Mr. Kethley.

**Bio. 334. Genetics**

3-3-4. Prerequisite: Bio. 333 or consent of instructor.
The effect of hereditary units in dynamic interplay with the environment on the development and function of organisms.

Text: Srb and Owens, General Genetics.

Mr. Fetner.

Bio. 407. Advanced Microbiology
3-4-4. Prerequisite: Bio. 307, Chem. 341.
Advanced discussion and laboratory procedures in Mycology, Virology, and bacterial Physiology.
Text: To be selected. Mr. Gaffney.

Bio. 411. Sanitation
3-0-3. Prerequisite: Bio. 307.
The principles of sanitation, water supplies, sewage and refuse disposal, food sanitation and inspection methods.

Bio. 413. Air and Water Pollution
3-0-3. Prerequisites: None.
An introduction to the technical and legal problems of air and water pollution by industry and its control, for those engineers working in industry (for non-Sanitary Engineers).
Text: References. Mr. Gaffney.

Bio. 415. Introductory Radiation Biology
3-3-4. Prerequisite: Consent of instructor.
A general survey of biological systems and their responses to various kinds of radiations.
Mr. Fetner.

Bio. 420. Water and Sewage Analysis
1-6-3. Prerequisite: Chem. 103.
A laboratory course to acquaint the Sanitary Engineer with the techniques of standard methods for the analysis of water and sewage.
Text: Committee—A.P.H.A. Standard Methods for the Examination of Water and Waste Water; Sawyer, Chemistry for Sanitary Engineers. Mr. Ingols.

Bio. 425. Microbiological Fermentations
3-0-3. Prerequisites: Bio. 307 and/or Chem. 342.
A study of the nutritional and environmental requirements for, and the mechanisms involved in the production of useful chemicals, foods and drugs by microbiological agencies.
Text: Steel, Biochemical Engineering. Mr. Gaffney.

Bio. 428. Survey of Sanitary Microbiology
2-6-4. Prerequisite: None.
A lecture and laboratory course to acquaint the sanitary engineer with the agents of disease and with the agents of sewage treatment.
Text: Kreuger, Principles of Microbiology. Mr. Gaffney.

Bio. 431. Cytology
3-6-5. Prerequisite: Bio. 204.
An introduction into the techniques of preparing living and fixed biological materials for study under light transmitting, phase contrast, interference, and electron microscopes.
Text: Laboratory manual (to be selected). Mr. Fincher.

Bio. 435, 436. Applied Biology
3-0-3. Prerequisite: Bio. 307.
A course dealing with the methods of applying basic biological principles and techniques to contemporary problems in the fields of public health and bioengineering with emphasis on their economic and environmental importance.
Text: References. Gaffney and Visiting Lecturers.

Bio. 440, 441, 442. General Physiology
3-3-4, 3-6-5, 3-6-5. Prerequisites: Bio. 307, Chem. 342.
The chemical, physical and biological responses and functions of living systems. The study of cellular biochemistry and metabolism, tissue and organ function, interrelationship of organ systems and the response of the whole organism to its environment.

Text: Giese, *Cell Physiology*; Other texts to be selected.

**Bio. 450. Seminar**

2-0-2. Prerequisite: Bio. 340 and senior status.

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Student and staff presentations of reports on laboratory or literature searches.

Text: References. Staff.

**Bio. 460, 461, 462. Special Problems**

Hours to be arranged. Prerequisite: Bio. 204.

A course for the study of special laboratory problems in biology, to be given any quarter with credits (not to exceed 6) to be arranged.

Text: References. Staff.

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**Graduate Courses Offered**

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<tr>
<th>Bio.</th>
<th>Course Title</th>
<th>Credits</th>
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<td>Sanitary Bacteriology</td>
<td>2-4-3</td>
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<tr>
<td>607</td>
<td>Parasitology</td>
<td>2-3-3</td>
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<tr>
<td>617</td>
<td>Industrial Hygiene</td>
<td>3-0-3</td>
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<tr>
<td>618</td>
<td>Industrial Hygiene Field Investigations</td>
<td>2-3-3</td>
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<tr>
<td>620</td>
<td>Water Treatment</td>
<td>2-3-3</td>
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<tr>
<td>621</td>
<td>Sewage Treatment</td>
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<td>623</td>
<td>Industrial Wastes &amp; Stream Pollution</td>
<td>2-6-4</td>
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<td>630</td>
<td>Biological Effects of Radiation</td>
<td>3-3-4</td>
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<td>702</td>
<td>Public Health Engineering Field Practices</td>
<td>0-6-2</td>
</tr>
</tbody>
</table>

(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)
School of Architecture
(Established in 1908)


General Information
The School of Architecture was established as a degree granting department of the Institute in 1908 and now offers the following courses of study—(1) the five-year curricula in Architecture with options in Architectural Design or Structural Design both leading to the degree Bachelor of Architecture, (2) a four-year curriculum in Building Construction leading to the degree Bachelor of Science in Building Construction and (3) a four-year curriculum in Industrial Design leading to the degree Bachelor of Science in Industrial Design. In addition, the graduate program in Architecture* prepares for the degree Master of Architecture, and the graduate program in City Planning* leads to the degree Master of City Planning.

Architecture
The original objective and first aim of the School is to prepare students for the profession of Architecture. The scope of the field is of such breadth in current practice that need is felt not only for men who are strong in design but for others whose interests will be closely integrated with design in structural and mechanical techniques. The training in Architecture is uniform for the first four years with two areas of specialization. Architectural Design and Structural Design, strongly emphasized in the final year. The central core of the curriculum in Architecture is the study of design, with related exercises in drawing, graphics, visual composition and model building. The student is given an opportunity in these courses to develop his creative as well as his analytical powers by finding solutions to programs employing the requirements of contemporary buildings and paralleling the conditions to be encountered in later practice. Instruction is generally in the form of guidance and suggestion on the part of the instructor to each student individually, accompanied by group discussions, lectures, and demonstrations. Solutions are submitted as drawings or models for review and judgment by a jury of teachers, practicing architects, and such designers or specialists as the occasion may require.

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

*For the graduate program in Architecture and City Planning, see Graduate Bulletin.
architecture supply a fuller understanding of our architectural heritage, its meaning and impact on contemporary problems. Work of technical importance is offered in building materials, mechanical plant (plumbing, heating, air-conditioning and electrical installations), office and field practice.

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

The National Council of Architectural Registration Boards and the Georgia State Board for the Examination, Qualification and Registration of Architects, recognize the Bachelor of Architecture degree at the Georgia Institute of Technology as adequate preparation for practice, with the exception of experience requirements. After three years internship in the office of a registered architect, Bachelor of Architecture graduates may apply for examination and registration as licensed architects.

All work executed in classes administered by the School becomes the property of the School and will be retained, or returned at the discretion of the faculty.

The faculty reserves the right to refuse for credit any project executed outside the precincts of the School of Architecture, or otherwise executed without proper coordination with the instructor.

Standards for Advancement

All students entering the School of Architecture are required during the first term of residence to take interest and aptitude tests with the Office of Guidance and Testing.

Curriculum in Architecture

In order for students to obtain the greatest benefit from courses offered concurrently in the curriculum, progress will be noted at several intervals as follows:

a) Averages in drawing and design will be checked at the end of each year group of three courses (151-52-53; 251-52-53, etc.). A student will not be permitted to enter a more advanced group until his record in the previous group equals 2.0 or better.

b) Admission to the third year of architecture will be based on Faculty approval plus the completion of all required and prerequisite courses, both academic and departmental, in the first two years of the curriculum. A point average in design of 2.0 and an overall average not less than 1.9 are required. The student on entering the third year must be prepared to schedule his primary subjects concurrently (Arch. 351, 361, 371).

c) Admission to the 5th year of Architecture will be based on Faculty approval plus the completion of all required and prerequisite courses, both academic and departmental, in the first four years of the curriculum. A point average of 2.0, both overall and in design courses is required. The student must be prepared to schedule his primary subjects concurrently (Arch. 551 or 554, 561 and C.E. 400); in addition he must present an affidavit confirming at least three months practical experience in the office of a registered architect or approved construction company.
d) Admission to the thesis in architecture requires Faculty approval and a minimum average of 2.0 in Arch. 551-52 (Option I) or 554-55 (Option II).

**Curriculum in Building Construction**

a) Requirements for the first two years are identical with those for architectural students.

b) Admission to the third year of Building Construction will be based on Faculty approval plus the completion of all required and prerequisite courses, both academic and departmental, in the first two years of the curriculum. An overall average not less than 1.9 is required. The student must be prepared to schedule his primary subjects concurrently (Arch. 322, 337, 371).

c) To become a candidate for a degree, the student must present an affidavit confirming at least three months practical experience with an approved construction or materials concern.

**Curriculum in Industrial Design**

a) Requirements for the first four quarters are identical with those for architectural students.

b) Averages in Industrial Design will be checked at the end of each year's group of courses (I.D. 202-3, I.D. 301-2-3, etc.). A student will not be permitted to enter a more advanced group until his record in the previous group equals 2.0 or better.

**ARCHITECTURE**

**Freshman Year (Uniform for Architecture, Building Construction and Industrial Design)**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch. 151-52-53</td>
<td>Arch. Drawing</td>
<td>0-9-3</td>
<td>0-9-3</td>
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<tr>
<td>Arch. 162-63</td>
<td>Arch. Orientation</td>
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<tr>
<td>Arch. 171-72-73</td>
<td>Graphics</td>
<td>1-3-2</td>
<td>1-3-2</td>
<td>1-3-2</td>
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<tr>
<td>Eng. 101-2-5</td>
<td>Composition and Rhetoric</td>
<td>3-0-3</td>
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<td>Math. 100</td>
<td>College Algebra and Trig.</td>
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<td>Math. 104</td>
<td>Analytic Geom. and Calculus</td>
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<td><em>M.L.</em> 104</td>
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<td>Physical Training</td>
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Totals: 16-17-19 16-17-19 16-17-19

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

*Chemistry is required in place of M.L. for the curricula in Building Construction and Industrial Design.

**For course numbers, see the course descriptions under the appropriate ROTC sections in this Bulletin.
### Sophomore Year

(Uniform for Architecture and Building Construction)

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng. 201-2-3</td>
<td>Survey of the Humanities</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<tr>
<td>Math. 202</td>
<td>Calculus</td>
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<td>Phys. 211-12-13</td>
<td>Mech.; Elec.; Heat, Light &amp; Sound</td>
<td>4-0-4</td>
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<td>P. T. 201-2-3</td>
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Totals: 15-20-20 15-20-20 15-20-20

*Arch. 351 is required in place of Arch. 253 for the curriculum in Building Construction.

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

### Junior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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<th>3rd Q.</th>
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<tr>
<td>Arch. 361-62-63</td>
<td>History and Theory</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<tr>
<td>Arch. 371-72-73</td>
<td>Structures</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td>3-0-3</td>
</tr>
<tr>
<td>Arch. 322-23-24</td>
<td>Building Materials</td>
<td>2-0-2</td>
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<tr>
<td>S.S. 111-12-13</td>
<td>Social Sciences</td>
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*Electives: 8 hours must be chosen from the restricted list of the School of Architecture, Group I or Group II corresponding to option.

9 hours must be chosen from the list of general electives approved by the School of Architecture.

9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

### Senior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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<tbody>
<tr>
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<td>Arch. 461-62-63</td>
<td>History and Theory</td>
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<td>Arch. 471</td>
<td>Structures</td>
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<tr>
<td>C.E. 306, 406</td>
<td>Structural Analysis, Reinforced Concrete</td>
<td>3-3-4</td>
<td>2-3-3</td>
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<tr>
<td>M.E. 334-35</td>
<td>Mech. Equip. Bldgs.</td>
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Totals: 12-18-18 11-24-19 11-21-18

*Electives: 8 hours must be chosen from the restricted list of the School of Architecture, Group I or Group II corresponding to option.

9 hours must be chosen from the list of general electives approved by the School of Architecture.

9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.
Fifth Year (Option I—Architectural Design)

<table>
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<th>Subject</th>
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<td>Arch. 561-62-63</td>
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<tr>
<td>Arch. 581-82-83</td>
<td>Professional Practice</td>
<td>3-0-3</td>
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<tr>
<td>C.E. 400</td>
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*Electives: 8 hours must be chosen from the restricted list of the School of Architecture, Group I or Group II corresponding to option.

9 hours must be chosen from the list of general electives approved by the School of Architecture.

9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

Fifth Year (Option II—Structural Design)

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<td>Arch. 554-55-56</td>
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<td>Arch. 561</td>
<td>Seminar</td>
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<td>Arch. 581-82-83</td>
<td>Professional Practice</td>
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<td>Arch. 522</td>
<td>Structural Design: Integration</td>
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<td>8-27-17</td>
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*Electives: 8 hours must be chosen from the restricted list of the School of Architecture, Group I or Group II corresponding to option.

9 hours must be chosen from the list of general electives approved by the School of Architecture.

9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

Building Construction

As one of the major industries in the country, Construction has need of many men who are trained in the field of materials, products, manufacture, sales and general contracting. The Building Construction curriculum at Georgia Tech is designed to supply graduates for these varied building activities which, with the architect and engineer, help to coordinate all building projects. The course parallels the curriculum in Architecture for the first two years, then specializes in technical studies in construction, materials, personnel and management problems. The degree, Bachelor of Science in Building Construction, is awarded on the completion of four years of study.
Freshman and Sophomore years—see Architecture.

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
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<th>3rd Q.</th>
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<tbody>
<tr>
<td>Arch.</td>
<td>322-23-24</td>
<td>Building Materials</td>
<td>2-0-2</td>
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<tr>
<td>Arch.</td>
<td>337-38-39</td>
<td>Arch. History</td>
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<td>Arch.</td>
<td>371-72-73</td>
<td>Structures</td>
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<td>C.E.</td>
<td>204</td>
<td>Elem. Surveying</td>
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<td>C.E.</td>
<td>306</td>
<td>Structural Analysis</td>
<td>3-3-4</td>
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<tr>
<td>Eng.</td>
<td>320</td>
<td>Tech. Writing</td>
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<tr>
<td>I.M.</td>
<td>204</td>
<td>Economics</td>
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<tr>
<td>I.M.</td>
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<td>Accounting Survey</td>
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<tr>
<td>M.E.</td>
<td>353</td>
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*Electives: 12 hours must be chosen from the approved list of the School of Arch. 9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
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<tr>
<td>Arch.</td>
<td>471</td>
<td>Structures</td>
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<td>Arch.</td>
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<td>Professional Practice</td>
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<td>Arch.</td>
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<tr>
<td>C.E.</td>
<td>406, 400</td>
<td>Reinforced Concrete</td>
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<td>M.E.</td>
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<td>Mech. Plant</td>
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<td>E.E.</td>
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<td>I.M.</td>
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<td>I.M.</td>
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<td>Survey of Bus. Law</td>
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<td>I.M.</td>
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*Electives: 12 hours must be chosen from the approved list in the School of Arch. 9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

### Industrial Design

Industrial Design deals with the development of those products of industry with which man, in utilizing them, has direct visual physical relationship, such as utensils, appliances, equipment, and furnishings for the home, industry, commercial and public places.

The specialized curriculum in Industrial Design begins with the second term of the Sophomore Year. It is comprised of two design series which are taken concurrently.

The Industrial Design Series deals with the nature of objects, the design processes, the different fields of design, and the types and groups of objects. In this series the student deals with the actual design and execution of test
models as well as with the theoretical aspect of design for mass-production.

The Material and Technique Series covers the relationship of design to various industrial materials and processes. In this series the student designs and executes objects, but is limited in each assignment to specific materials and/or processes.

The degree, Bachelor of Science in Industrial Design, is awarded on the completion of four years of study.

**Freshman year—see Architecture.**

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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<td>Arch. Design</td>
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<td>Arch. 254-55</td>
<td>Color Theory</td>
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<td>I.D. 202-3</td>
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<td>Materials and Technique</td>
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<tr>
<td>Math. 202</td>
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<tr>
<td>Phys. 211-12-13</td>
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<td>4-0-4</td>
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<tr>
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<td>Physical Training</td>
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Totals 15-20-20 13-23-19 13-23-19

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

**Junior Year**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<tbody>
<tr>
<td>Arch. 354-55</td>
<td>Arch. Rendering</td>
<td>0-3-1</td>
<td>0-3-1</td>
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<tr>
<td>Arch. 337-38-39</td>
<td>Arch. History</td>
<td>2-0-2</td>
<td>2-0-2</td>
<td>2-0-2</td>
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<tr>
<td>I.D. 301-2-3</td>
<td>Design</td>
<td>1-12-5</td>
<td>1-12-5</td>
<td>1-15-6</td>
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<tr>
<td>I.D. 314-15-16</td>
<td>Material and Technique</td>
<td>1-3-2</td>
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<td>Met. 325</td>
<td>General Metallurgy</td>
<td>3-0-3</td>
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<tr>
<td>I.E. 311</td>
<td>Manufacturing Processes</td>
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<td>3-0-3</td>
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<td>M.L. or S.S.</td>
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<tr>
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<td>6-0-6</td>
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</table>


*Electives: 14 hours must be chosen from the approved list of the School of Arch. 9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.*
## Senior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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<tr>
<td>Arch. 530</td>
<td>Art History</td>
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<tr>
<td>I.D. 401-2-3</td>
<td>Design</td>
<td>1-15-6</td>
<td>1-18-7</td>
<td>1-21-8</td>
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<td>I.D. 414</td>
<td>Material and Technique</td>
<td>1-3-2</td>
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<tr>
<td>Eng. 320</td>
<td>Tech. Writing</td>
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<tr>
<td>I.E. 490</td>
<td>Legal and Ethical Phases of Engr.</td>
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<td>I.M. 317</td>
<td>Industrial Marketing</td>
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<tr>
<td>Psy. 303-4</td>
<td>General Psychology A and B</td>
<td>3-0-3</td>
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<td>S.S. 313</td>
<td>Problems of Public Opinion</td>
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<td>4-0-4</td>
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**Totals** 12-18-18 12-18-18 11-21-18

*Electives: 14 hours must be chosen from the approved list of the School of Arch. 9 hours may be used as free electives. If advanced military is elected, 9 hours only will be credited toward a degree.

General Electives: See humanities list on page 34 plus the following: C.E. 201 or 204; Eng. 315, 320; Geol. 101, 201; I.D. 215, 216; I.M. 316, 317, 329; Math. 203, 304; Text. 231, 232.

Restricted Electives: Group I: Arch. 254, 255, 354, 355, 416, 430, 444, 510, 511, 512, 522, 530, 540, 541. Group II: Arch. 540, 541, 584; C.E. 201 or 204, 409; I.M. 405; M.E. 353.

### Courses of Instruction: Architecture

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

**Arch. 151, 152, 153. Architectural Drawing**
0-9-3.

Introductory studies in drawing and the principles of visual expression; includes one laboratory period per week in freehand drawing.


Mr. Rabun, Mr. Greene, Staff.

**Arch. 162, 163. Orientation**
1-0-0.

An introduction to the field of architecture and design; a requirement for all students in the School of Architecture.


Mr. Beckum, Mr. Wilson.

**Arch. 171, 172, 173. Graphics**
1-3-2.

Lectures and laboratory exercises in descriptive geometry; shades and shadows; perspective.


**Architectural Graphics**.

Mr. Gailey, Mr. Greene, Mr. Rabun.

**Arch. 251, 252, 253. Design**
0-15-5. Prerequisites: Arch. 153, 163, 173.

Basic composition, architectural problems and presentation methods; includes one laboratory period per week in freehand drawing.

Text: None.

Mr. Beckum, Mr. Greene, Mr. Norris, Mr. Shipley.

**Arch. 254, 255. Color Theory**
1-3-2. Prerequisite: Arch. 251 or Soph. Standing.

Lecture and laboratory experiments on the properties of color and its use in design.

Text: None.

Mr. Greene.

**Arch. 310, 311, 312. Freehand Drawing**
0-3-1.

For non-architects and architects entering under catalogs previous to June, 1961. Freehand drawing from compositions by students.

Text: None.

Mr. Harris, Mr. Beattie.
Arch. 322, 323, 324. Building Materials
2-0-2. Prerequisite: Arch. 253 or consent.
A study of materials of construction, their properties and use in modern construction, with special attention to their effect upon architectural design.
Text: Hornbostel, Materials for Architecture. Mr. Gailey or Mr. Polychrone.

Arch. 337, 338, 339. Architectural History
2-0-2. Prerequisite: Arch. 252 or consent.
A survey course in architectural history for non-architectural students. In non-technical language, it covers architectural development from ancient times to the present. Lectures, supplemented by slide projection, notes and reading assignments.

Arch. 351, 352, 353. Design
0-15-5. Prerequisites: Arch. 253 and admission to the third year curriculum.
Elementary problems in architectural design and presentation methods; includes one laboratory period per week in freehand drawing.
Text: Dietz, Dwelling House Construction. Mr. Saporta, Mr. Grady.

Arch. 354, 355. Architectural Rendering
0-3-1. Prerequisite: Arch. 251.
Rendering of architectural subjects in various media.
Text: None. Mr. Rabun.

Arch. 361, 362, 363. History and Theory
3-0-3. Prerequisite: Admission to the third year curriculum or consent.
History of architecture in ancient Egypt and Mesopotamia, Greece and Rome; Medieval Europe; the Renaissance in continental Europe.
Text: Banister Fletcher, A History of Architecture. Mr. Beckum, Mr. Shipley.

Arch. 371, 372, 373. Structures
3-0-3. Prerequisites: Mech. 343 and admission to the third year curriculum.
Introduction to methods of construction, proportioning and qualitative explanation of behavior; theory and design of ordinary timber structures; theory and design of metal structures (Part 1).

Arch. 381, 382. Design and Graphic Presentation
1-12-4. Prerequisite: Senior standing.
A basic course in drawing and design for students preparing for the Master's program in City Planning. Not open to architectural students.
Text: None. Mr. Rabun.

Arch. 410. Freehand Drawing
0-6-2.
For non-architects, and architects entering under catalogs previous to June, 1961.
Pencil sketching.
Text: None. Mr. Beattie, Mr. Wilson.

Arch. 411. Freehand Drawing
0-3-1.
For non-architects, and architects entering under catalogs previous to June, 1961.
Pen and ink sketching.
Text: None. Mr. Wilson.
Arch. 412. Freehand Drawing
0-6-2.
For non-architects, and architects entering under catalogs previous to June, 1961.
Water color sketching.
Text: None. Mr. Beattie or Mr. Rabun.

Arch. 416. Introduction to Landscape Architecture
2-0-2. Prerequisites: Arch. 451 and Arch. 461.
A brief history of landscape architecture followed by a study of the principles of landscape design as applied to contemporary problems.
Text: None. Mr. Byrd.

Arch. 430. Art History
2-0-2. Prerequisite: Junior standing.
A short history of Pre-Columbian and Oriental art and architecture.
Text: None. Mr. Shipley.

Arch. 435. Art History
2-0-2. Prerequisite: Junior standing.
A survey course in the history of artistic manifestations from primitive times to our own day.
Text: Upjohn, Wingert and Mahler, History of Art. Mr. Harris.

Arch. 444. Housing Seminar
2-0-2. Prerequisite: Junior standing.
Lecture and discussion broadly covering the housing field and the home building industry, housing needs, housing markets and financing, standards of design and construction, the Government and housing.
Text: Bayer, Housing, A Factual Analysis. Mr. Saporta.

Arch. 451, 452, 453. Design
0-18-6. Prerequisites: Arch. 353 and advancement standard.
Intermediate problems in architectural design and presentation methods; includes one laboratory period per week in freehand drawing and modeling.
Text: None. Mr. Wilson.

Arch. 461, 462, 463. History and Theory
3-0-3. Prerequisite: Arch. 363 and advancement standard.
Renaissance architecture in England and America; the 19th and 20th centuries; history of town and city planning in Europe and America.
Mr. Grady, Mr. Saporta.

Arch. 471. Structures
3-0-3. Prerequisite: Arch. 373.
Theory and design of metal structures (Part II).
Mr. Gailey, Mr. Polychrone.

Arch. 510, 511, 512. Freehand Drawing: Advanced
0-3-1. Prerequisite: Arch. 453.
Freehand drawing of varied subjects and in various media.
Text: None. Mr. Beattie.

Arch. 513, 514. Freehand Drawing: Advanced
0-3-1, 0-6-2. Prerequisite: Arch. 453.
Freehand drawing from live models.
Text: Albert and Seckler, Figure Drawing Comes to Life.
Mr. Beattie.

Arch. 522. Structural Design: Integration
3-3-4. Prerequisites: Arch. 373 and C.E. 400 or concurrent.
This course brings together the information obtained in previous courses in Structural Design and presents the subject matter as an integrated whole.
Text: None. Mr. Polychrone.
Arch. 530, Art History
2-0-2. Prerequisites: Arch. 339, 462 or consent.

A survey of 19th and 20th century art in Europe and the United States.
Text: None.
Mr. Grady.

Arch. 540, 541, Research
0-6-2, 0-9-3 or 1-9-4.

A clearly stated program by the student describing in detail the nature, purpose and extent of the proposed problem must be submitted for approval. The major portion of the work will be conducted in library, drafting room, or shop.
Text: None.
Staff.

Arch. 551, 552, 553, Design

Group I. Advanced problems in architectural design with emphasis on the solution of complex building programs and site planning, terminating in an independent major problem submitted as a thesis for the degree Bachelor of Architecture (Option I).
Text: None.
Mr. Heffernan, Mr. Polychrone, and Staff.

Arch. 554, 555, 556, Design

Group II. Advanced Problems in architectural design with emphasis on structural solutions, computations and details, terminating in an independent problem submitted as a thesis for the degree Bachelor of Architecture (Option II).
Text: None.
Mr. Heffernan, Mr. Polychrone, and Staff.

Arch. 561, 562, 563, Seminar
2-0-2. Prerequisites: Arch. 453, 463.

Preparation of thesis programs and research; lectures and discussions of current problems in architecture and design.
Text: None.
Staff.

Arch. 581, 582, 583, Professional Practice
3-0-3. Prerequisites: Arch. 453, 463 or Senior standing.

Conduct of architectural practice, office organization, competitions, contracts, legal and ethical problems; specification writing; estimating and supervision of construction.
Mr. Edwards, Mr. Saporta.

Arch. 584, Cost Analysis
2-3-3. Prerequisite: Senior standing.

Principles and methods of cost analysis in the construction industry. Methods of compiling and analyzing material, labor and equipment production costs. Exercises in office and field management procedures.
Text: Clough, Construction Contracting.
Mr. Polychrone, Mr. Gailey.

Courses of Instruction: Industrial Design

All Courses conducted by Mr. Bredendieck and Mr. Seay.

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

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
Introduction to design analysis.
Design of simple objects.
Text: None.

I.D. 215. Material and Technique
1-3-2. Prerequisite: Arch. 103 or consent.
The standard joints and hand operated machines. Exercises, execution and development of joints.
Text: None.

I.D. 216. Material and Technique
1-3-2. Prerequisite: I.D. 215 or consent.
Continuation of I.D. 215, hand operated machines—wood and metal turning, spinning, bending, laminating, etc. Assembly techniques. Demonstration, exercises, field trips, and design of objects for manufacturing processes.
Text: None.

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. Design of objects from different groups.
Text: None.

I.D. 302. Design
1-12-5. Prerequisite I.D. 301. Concurrent with I.D. 315.
Design 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
Design 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 design of objects for the various techniques.
Text: Bolz, Manufacturing Processes and Their Influence on Design.
DuMond, Fabricated Materials and Parts.

I.D. 315. Material and Technique
1-3-2. Prerequisite: I.D. 314.
The industrial pre-formed materials—extrusion, rolled and drawn profiles, mouldings, etc.
Demonstration, exercises, field trips, and design of objects for the various techniques.
Text: Bolz, Manufacturing Processers and Their Influence on Design.
DuMond, Fabricated Materials and Parts.

I.D. 316. Material and Technique
1-3-2. Prerequisite: I.D. 315.
Semi-automatic and mass-production techniques—forging, stamping, heading, screw machining, wire forming.
Demonstration, field trips, and design of objects for various techniques.
Text: Bolz, Manufacturing Processes and Their Influence on Design.
DuMond, Fabricated Materials and Parts.

I.D. 401. Design
Design of appliances and equipment for the commercial, industrial and public fields (such as machines, store and office appliances). Design of packaging for industrial products.
Text: None.
I.D. 402. Design  
1-18-7. Prerequisite: I.D. 401.  
Design 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—molding, etc.  
Demonstration, field trips, and design of objects for each technique.  
Text: Bolz, Manufacturing Processers and Their Influence on Design.  
DuMond, Fabricated Materials and Parts.

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; Professors—Willis E. Moody, Harrison W. Straley, III; Associate Professors—William C. Hansard, Charles F. Wysong; Special Lecturers—John Husted, R. A. Young; Senior Secretary—Thelma Saggus; Laboratory Mechanic—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 contracts 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

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
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<td>Chem.*</td>
<td>101-2-3</td>
<td>General Chemistry</td>
<td>3-3-4</td>
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<td>Draw.</td>
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<td>Eng.</td>
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<td>Composition and Rhetoric</td>
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<td>S.S.</td>
<td>111-12-13</td>
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<td>P.T.</td>
<td>101-2-3</td>
<td>Physical Training</td>
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<td>101</td>
<td>Orientation</td>
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</table>

**Totals**: 18-14-20 17-14-20 17-14-20

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

*Chem. 107-108-109 is a recommended substitution for Chem. 101-2-3. A grade of C or better in Chem. 103 is a prerequisite for Chem. 214.

**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.

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

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<th>3rd Q.</th>
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<tr>
<td>Cer.E.</td>
<td>202</td>
<td>Products and Materials</td>
<td>2-3-3</td>
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<tr>
<td>Cer.E.</td>
<td>203</td>
<td>Equipment and Tests</td>
<td>2-3-3</td>
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<tr>
<td>Cer.E.</td>
<td>208</td>
<td>Ceramic Survey</td>
<td>2-0-2</td>
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<tr>
<td>Cer.E.</td>
<td>209</td>
<td>Ceramic Survey Laboratory</td>
<td>0-3-1</td>
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<tr>
<td>Chem.</td>
<td>214</td>
<td>Analytical Chemistry</td>
<td>2-6-4</td>
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<tr>
<td>Eng.</td>
<td>201</td>
<td>Survey of the Humanities</td>
<td>3-0-3</td>
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<td>Geol.</td>
<td>201</td>
<td>General Geology</td>
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<td>Geol.</td>
<td>202</td>
<td>General Geology Laboratory</td>
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<td>Math.</td>
<td>202-3</td>
<td>Calculus</td>
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<tr>
<td>Phys.</td>
<td>207-8-9</td>
<td>Physics</td>
<td>5-3-6</td>
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<td>P.T.</td>
<td>201-2-3</td>
<td>Physical Training</td>
<td>0-4-1</td>
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**Totals**: 17-17-21 18-14-21 18-11-20

**For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
## Junior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<th>3rd Q.</th>
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<tbody>
<tr>
<td>Cer.E. 305</td>
<td>Phase Equilibria for Ceramists</td>
<td>3-0-3</td>
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<tr>
<td>Cer.E. 311</td>
<td>Processing and Forming</td>
<td>3-3-4</td>
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<tr>
<td>Cer.E. 315</td>
<td>Solid State Ceramics</td>
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<td>Cer.E. 318</td>
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<td>17-9-20</td>
<td>14-9-17</td>
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*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

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**Totals**                         | 17-6-19| 14-18-20| 9-15-14|

*Not more than 9 hours electives may be in advanced ROTC.

**At least 6 hours electives must be in Humanities from approved list on page 34.
Recommended Electives*

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<td>Cer.E 450</td>
<td>Engineering Materials in Nuclear Engineering</td>
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<td>Elementary Aerial Photogrammetry</td>
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<td>Crystallography and Tests</td>
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<td>Introduction to Geophysics</td>
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<td>Geol. 445</td>
<td>Mining of Ceramic Materials</td>
<td>2-0-2</td>
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</table>

*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.

Courses of Instruction

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

**Cer.E. 202. Products and Materials**

2-3-3. Prerequisites: Chem. 103, Cer.E. 208.

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, the effects of size, and the physical properties of particles are stressed. Text: Norton, *Elements of Ceramics*. Mr. Mitchell and Mr. Wysong.

**Cer.E. 203. Equipment and Tests**

2-3-3. Prerequisite: Chem. 103, Cer.E. 208.

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 of testing. Mathematical analysis of data; inherent errors.

Text: Wilson, *An Introduction to Scientific Research*.

Mr. Wysong and Mr. Mitchell.

**Cer.E. 208. Ceramic Survey**

2-0-2. Prerequisite: None. General Elective for non-ceramic majors.

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.

Mr. Mitchell or Mr. Hansard.
Cer.E. 209. Ceramic Survey Laboratory  
0-3-1. Prerequisite or Corequisite: Cer.E. 208.  
Plant trips to local ceramic plants. Production of molds and pottery.  
Text: None.  
Mr. Hansard.

Cer.E. 305. Phase Equilibria for Ceramists  
3-0-3. Prerequisite or Corequisite: Cer.E. 320, Chem. 331.  
Heterogeneous equilibria of inorganic systems. One, two, and three component systems. Solid solutions and isomorphous replacement. Alkemade lines. Metastable equilibrium. Paths of crystallization.  
Mr. Wysong.

Cer.E. 311. Processing and Forming  
3-3-4. Prerequisite: Cer.E. 203.  
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 and Dulberg, Fundamentals of Ceramics.  
Mr. Wysong or Mr. Moody.

Cer.E. 315. Solid State Ceramics  
3-0-3. Prerequisite: Cer.E. 311.  
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. Sintering, melting, and crystallization processes and their effects on structure and density are discussed. Whitewares, terra cotta, heavy clay products, glass, and body, mold, and saggar composition and processing are studied.  
Text: Kingery, Introduction to Ceramics; Course Notes.  
Mr. Moody.

Cer.E. 318. Pyrometry and Instruments  
1-3-2. Prerequisite: Physics 208.  
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, CO₂ meters, temperature controls, and other control instruments.  
Text: Foote, Fairchild and Harrison, Pyrometric Practice; Dike, Thermoelectric Thermometry.  
Mr. Wysong.

Cer.E. 320. Glass  
2-3-3. Prerequisite or Corequisite: Cer.E. 305.  
The fundamentals of glass structure, composition, manufacture, properties and applications. Phase relations of the important oxides. Reasons for glass formation instead of crystallization. Melting, quenching, annealing, tempering, fracturing, devitrification and modification are phenomena studies. Techniques of forming and basis of selection of ingredients for glass forming, fluxing, color, refractive index, and other properties are carefully considered.  
Text: Morey, Properties of Glass.  
Mr. Moody.
Cer.E. 406-7-8. Seminar
2-0-2. Prerequisite: Senior standing in Cer.E.

Discussion of current ceramic and scientific literature and reports of investigation. Course may be repeated with different numbers.

Text: *Journal of American Ceramic Society.* Mr. Moody, Mr. Wysong.

Cer.E. 409. Microscopy
3-6-5. Prerequisites: Physics 209, Geology 414.

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: Kerr, *Optical Mineralogy.* Mr. Wysong.

Cer.E. 422-23-12. Thesis
1-0-1, 0-6-2, 0-6-2. 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. Staff.

Cer.E. 418. Drying and Psychrometry
2-0-2. Prerequisites: Cer.E. 315, Physics 209.

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.


Cer.E. 419. Firing and Combustion
2-3-3. Prerequisites: Physics 209, M.E. 320 or equivalent.

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.


Cer.E. 421. Cements
2-3-3. Prerequisites: Chem. 332; Cer.E. 305.

Includes the required properties of raw materials, processing and the hydraulic properties of cements. Portland, magnesia, high alumina, 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. 425-426. Physical Ceramics
3-3-4, 2-0-2. Prerequisites: Cer.E. 315, Chem. 331, and Physics 209.

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, electrodialysis, viscosity measurement, x-ray analysis, and other techniques of analysis are studied in the laboratory. Sintering, melting, and recrystallization.

Text: Kingery, *Introduction to Ceramics; Course notes*. Mr. Moody, Mr. Mitchell.

Cer.E. 431-32-34. Design and Construction
1-3-2, 0-6-2, 0-3-1. Corequisite: Cer.E. 418. Prerequisite: Drawing 109 (or 103).

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.

Mr. Wysong, Mr. Hansard.

Cer. E. 440. Glaze and Enamel Coatings
3-3-4. Prerequisite: Cer.E. 320.

The fundamental methods for calculating, compounding, manufacturing and using vitreous and crystalline protective coatings as well as the methods commonly employed to correct faults. The prior preparations of frits, and ceramic bodies for glazing, or metals or glass for enameling are also considered. Compositions of low, moderate, and high temperature coatings are studied to learn bases of glass properties, adherance, color, opacification, and texture.


Mr. Hansard.

Cer.E. 450. Engineering Materials in Nuclear Engineering
2-3-3. Prerequisites: Senior or graduate standing and consent of instructor.

The basic principles of ceramic and metallurgy with particular emphasis on problems inherent in reactor technology. Engineering aspects of the structure and constitution of materials used in reactors including ceramic materials, cermets, metals and alloys. The behavior of these materials under conditions involving elevated temperatures, corrosion, and irradiation.


Geol. 101. Introduction to Earth Science
3-0-3. Prerequisite: None.

A survey of both celestial and earthly environment surrounding humanity; utilizing nature's storehouse of raw materials.

Text: Kendall, Glendenning, and MacFadden, *Introduction to Physical Geography*. Mr. Straley.

Geol. 201. General Geology
3-0-3. Prerequisite: None.

An introduction to geological processes, including lectures on historical and economic geology, with special emphasis upon the needs of the engineer.


Geol. 202. General Geology Laboratory
0-3-1. Prerequisite or Corequisite: Geol. 201.

An introduction to the study of minerals, rocks, topographic and geological maps, with special emphasis upon the needs of the engineer.

Text: Ellison, *General Geology Laboratory Workbook*. Mr. Straley.

Geol. 305. Historical Geology
3-0-3. Prerequisites: Chem. 103; Phys. 207, Geol. 201, 202.

A course of recitations and lectures in Historical Geology.

Text: Moore, *Introduction to Historical Geology*. Mr. Straley.
Geol. 307. Historical Geology Laboratory
0-3-1. Prerequisite or Corequisite: Geol. 305.
Recognition and classification of fossils.
Text: Laboratory Notes.
Mr. Husted.

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

Geol. 311. Economic Geography
3-0-3. Prerequisite: None.
The effects of climate, location, power, soil types, mineral deposits, agriculture and manufacture upon nations, peoples, civilization, and trade routes.
Text: Jones and Darkenwald, Economic Geography.
Mr. Straley.

Geol. 312. Economic Geology
3-0-3. Prerequisites: Geol. 201-2.
A geographical and economic study of all commercially valuable minerals and rocks.
Text: Lovering, Minerals and World Affairs.
Mr. Straley.

Geol. 313. Economic Geology Laboratory
0-3-1. Corequisite or Prerequisite: Geol. 312.
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 and Ford, Textbook of Mineralogy; Laboratory notes.
Mr. Husted.

Geol. 414. Mineralogy
2-3-3. Prerequisites: Geol. 201, 202.
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, 5th Ed.
Mr. Husted.

Geol. 418. Petrography
2-6-4. Prerequisite: Geol. 414, Senior standing.
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.
Mr. Straley.

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

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

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

Geol. 424-25-26. Field Methods in Geology
0-6-2, 0-6-2, 0-6-2. Prerequisites. Geol. 201-2, Senior standing.
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.
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.
Mr. Straley.

Geol. 445. Mining of Ceramic Materials
2-0-2. Prerequisites: Geol. 312, Senior standing.
Methods of developing and producing fuel and mineral deposits, with emphasis upon application 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 ceramic industries and to methods of tunneling as used by the civil engineer.
Mr. Straley.

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—H. V. Grubb; Regents’ Professor—W. T. Ziegler; Professors—Niels N. Engel, H. C. Lewis, J. W. Mason, W. M. Newton, Clyde Orr, Jr., Henderson C. Ward; Associate Professors—J. D. Fleming, R. F. Hochman; Assistant Professor—J. M. Spurlock; Graduate Assistants—D. B. Bivens, R. L. Briant, J. F. Lyle, W. W. Piper, R. A. Tickner, J. W. Whatley; 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

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*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 C or better.

**German recommended.

Sophomore Year

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***For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
### Junior Year

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<td>Ch.E.</td>
<td>302 Chemical Engineering Calculations</td>
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**Totals** 15-12-19 15-9-18 17-9-20

*Not more than 9 hours electives may be in advanced ROTC. At least 6 hours of electives must be humanities from list on page 34.

### Senior Year

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<td>446 Comprehensive Problems</td>
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<td>431 Chemical Engineering Economics</td>
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<td>434 Chemical Plant Design</td>
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<td>E.E.</td>
<td>325 Electrical Circuits and Fields</td>
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<td>326 or Elementary Electronics</td>
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<td>E.E.</td>
<td>327 Electric Power Conversion</td>
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<td>341 Process Instrumentation</td>
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</table>

**Totals** 15-6-17 17-3-18 15-12-19

**Courses of Instruction**

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

**Ch.E. 202. Stoichiometry and Material Balance**

Stoichiometric principles and calculations and material balances are applied to chemical processes.


**Ch.E. 302. Chemical Engineering Calculations**
3-3-4. Prerequisites: Ch.E. 202 and Math. 203.

Energy balances are applied to the thermochemical problems in the first part, and to fluid flow in the last part.

Ch.E. 311. Chemical Engineering Analysis
3-0-3. Prerequisites: Ch.E. 314 and Math. 304.
Application of mathematics to problems in the analyses of chemical engineering processes and operations. Text: To be selected.
Mr. Newton, Mr. Ward.

Ch.E. 314. Unit Operations
3-3-4. Prerequisites: Ch.E. 302 and Chem. 331.
Flow through porous media, filtration, elementary heat transfer, and evaporation.
Text: McCabe and Smith, *Unit Operations of Chemical Engineering*.
Mr. Ward and Mr. Fleming.

Ch.E. 315. Unit Operations
3-3-4. Prerequisite: Ch.E. 302.
Continuation of Ch.E. 314.
Stagewise operations.
Text: McCabe and Smith, *Unit Operations of Chemical Engineering*; Perry, *Chemical Engineer's Handbook*; Staff, *Laboratory Notes*.
Mr. Grubb.

Ch.E. 328. Chemistry of Engineering Materials
3-0-3. Prerequisite: Chem. 103.
A survey of materials of construction with emphasis on nonmetallics. The fundamental properties of plastics, and all types of surface coatings are studied.
Staff.

Ch.E. 329. Survey of Chemical Engineering
3-0-3. Prerequisites: Chemistry 103, Mathematics 103 and Physics 209 or 213.
A general survey of chemical engineering including processes, equipment and calculations. Not open to students in the School of Chemical Engineering.

Mr. Spurlock.

Ch.E. 339. Chemical Engineering Literature
1-0-1. Prerequisites: Ch.E. 302, Chem. 340, 331.
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: *Staff Notes*.
Mr. Ziegler.

Ch.E. 341. Process Instrumentation
2-3-3. Prerequisite: Ch.E. 314; E.E. 326 recommended.
A study of the methods and technology associated with chemical process systems analysis and the application of measurement and control devices and techniques to these systems.
Mr. Spurlock.

Ch.E. 350. Elementary Heat and Mass Transfer
3-0-3. Prerequisites: Math. 203, Physics 209, M.E. 320, and Senior standing or consent of instructor.
Elementary heat and mass transfer primarily designed for Textile students. Not open to students in the School of Chemical Engineering. Offered in the fall quarter only.
Text: *Staff Notes*.
Mr. Spurlock.

Ch.E. 407. Chemical Process Analysis
3-0-3. Prerequisites: Ch.E. 315, Chem. 342 and Chem. 333. Fall and spring.
Introduction to the engineering of chemical reaction involving colloidal and amorphous materials.
Mr. Lewis.
Ch.E. 408. Chemical Process Analysis
Introduction to applied chemical kinetics.
Text: To be selected. Mr. Lewis.

Ch.E. 411. Nuclear Engineering Fundamentals
3-0-3. Prerequisites. Ch.E. 314, Met. 401, Phys. 319 recommended.
Survey of the principles of design and analysis of nuclear reactor systems stressing the relation of chemical engineering to the nuclear industry.
Text: Staff notes. Mr. Fleming.

Ch.E. 413. Unit Operations
3-3-4. Prerequisite: Ch.E. 315.
Continuation of Ch.E. 314-315. Diffusional processes, including combined mass and heat transfer.
Text: Perry, *Chemical Engineer's Handbook*; McCabe and Smith, *Unit Operations of Chemical Engineering*. Mr. Grubb and Mr. Newton.

Ch.E. 431. Chemical Engineering Economics
3-0-3. Prerequisite: Ch.E. 315.
A study of techniques required in project analysis in areas of systems cost analysis and the use of the economic balance for design and optimization.

Ch.E. 434. Chemical Plant Design
1-6-3. Prerequisites: Chem. 333, Ch.E. 413, Mech. 302. Fall and spring.
A comprehensive problem in plant design.
Text: None. Mr. Lewis.

Ch.E. 435-436-437. Chemical Engineering Thermodynamics
3-0-3. Prerequisites: Chem. 333 and Ch.E. 315.
A study of the principles of thermodynamics with applications to the problems of industry. The areas covered include flow of compressible fluids, estimation and use of thermodynamic properties, charts and tables, power and refrigeration cycles, phase equilibria, chemical equilibria and properties of solutions.

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. Staff.

Ch.E. 446. Comprehensive Problems
3-0-3. Prerequisites: Ch.E. 408, 431, 436.
The integration of the professional work of the previous courses by means of a series of comprehensive problems.
Text: To be selected. Mr. Newton and Mr. Ward.

Ch.E. 447. Comprehensive Problems
3-0-3. Prerequisites: Ch.E. 446, 413, 407, 435, Met. 402.
Continuation of Ch.E. 446. Emphasis on Unit Operations.

Ch.E. 448. Comprehensive Problems
3-0-3. Prerequisites: Ch.E. 447, 408, 436, Met. 402.
A continuation of Ch.E. 447, with emphasis on thermodynamics.
Courses of Instruction in Metallurgy

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

*Met. 325. General Metallurgy
(Formerly Ch.E. 325)
3-0-3. Prerequisites: Chem. 103 and Physics 207.
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.
Mr. Hochman.

Met. 327. General Metallurgy
(Formerly Ch.E. 327)
3-0-3. Prerequisite: Met. 325.
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.
Staff.

Met. 401. Engineering Materials
(Formerly Ch.E. 425)
3-0-3. Prerequisite: Chem. 333.
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: Guy, Elements of Physical Metallurgy.
Mr. Engel.

Met. 402. Engineering Materials
(Formerly Ch.E. 426)
3-3-4. Prerequisite: Met. 401.
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: Guy, Elements of Physical Metallurgy and Staff Notes.

Met. 401. Basic Extractive Metallurgy
3-0-3. Prerequisite: Chem. 333 or equivalent.
Theory and practice of extraction and refining of ferrous and nonferrous metals. Calculations and reactions related to pyrometallurgical and hydro-metallurgical extractive processes will be emphasized.
Text: Newton, Extractive Metallurgy.
Staff.

Met. 411. Nonferrous Metallography
(Formerly Ch.E. 428)
2-3-3. Prerequisite: Met. 441 or 402, or equivalent.
The use of the microscope to study the influence of processing variables on the structure and properties of metals and alloys. Pyrometric instrumentation as applied to heat treating operations and thermal analysis of metals and alloys is also covered.
Text: Kehl, Metallographic Laboratory Practice.
Mr. Engel.

Met. 422. Ferrous Metallography
3-3-4. Prerequisites: Met. 401 and 402.
The influence of processing variables on the microstructure and properties of steels and ferrous alloys. Heat treat operations and thermal

*This course is not to be scheduled by chemical engineering students, since they are required to schedule Met. 401.
analysis of ferrous materials.

**Met. 423. Metallurgical Fabrication**
3-0-3. Prerequisite: Met. 401.
Primary forming techniques and secondary fabrication and joining processes will be discussed. Some of the processes to be considered are casting, rolling, forging, welding, etc.
Text: Semans, *Engineering Materials*, the *ASM Handbook* and *Staff Notes*.

**Met. 441. Theoretical Physical Metallurgy**
(Formerly Ch. E. 427)
3-0-3. Prerequisite: Met. 402 and Chem. 333 or equivalent.
A study of the physical and mechanical properties of metals and alloys in the light of their structure.
Mr. Engel and Mr. Hochman.

**Met. 445. Electron Microscopy**
The theory and principles of electron optics and electron microscopy will be covered. Techniques of preparation and observation of materials by electron microscopy will be presented in lecture and applied in the laboratory.
Mr. Hochman.

**Met. 461. Pyrometry**
1-3-2. Prerequisite: Met. 402.
Temperature measurement and control methods. Dilations, resistance, thermoelectric, total radiation, and color pyrometry. Control devices and methods of obtaining constant temperature.
Text: To be selected.

**Graduate Courses Offered**

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<td>Technology of Fine Particles</td>
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<tr>
<td>Ch.E. 619</td>
<td>Chemical Engineering Calculations</td>
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<tr>
<td>Ch.E. 620</td>
<td>Applied Mathematics in Chemical Engineering</td>
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<td>Ch.E. 622</td>
<td>Applied Chemical Kinetics</td>
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<td>Ch.E. 630</td>
<td>Radiochemical Separations Processes I</td>
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<td>Ch.E. 631</td>
<td>Radiochemical Separations Processes II</td>
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<td>Economic Analysis of Chemical Engineering Processes</td>
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<td>Ch.E. 704, 5, 6</td>
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<td>Ch.E. 707, 8, 9</td>
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<td>Ch.E. 716, 17, 18</td>
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<td>Ch.E. 719, 20, 21</td>
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<td>Properties of Matter at Low Temperatures</td>
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<td>Special Topics in Thermodynamics</td>
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<td>Ch.E. 732</td>
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<td>Ch.E. 742</td>
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**Graduate Courses in Metallurgy**

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(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)


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, and Master of Science in Nuclear Science.
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 51 quarter hours of elective work. No elective course will be given for less than six applicants. A student must have had the prerequisites for any course he elects.

A prerequisite for senior courses is a minimum grade-point average of 2.0 in the following junior courses: Chem. 331, 332, 333, 334, 335, 340, 341, 342, 343, 344, and 345.
### Freshman Year

<table>
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**NOTE:** Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

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

**The School of Chemistry recommends that German be taken in the Freshman year. However, should Social Science be taken in the freshman year, German must be elected in the junior year.

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

### Sophomore Year

<table>
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<tr>
<td>Eng. 201-2-3</td>
<td>Survey of Humanities</td>
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**For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.

### Junior Year

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<td>Organic Chemistry Laboratory</td>
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<td>Chem. 331-2-3</td>
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**For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
Senior Year

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<td>Chem. 403</td>
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<td>Chem. 405-6</td>
<td>Instrumental Analysis</td>
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<td>Inorganic Chemistry</td>
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<td>Special Problems</td>
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Totals       9-6-17  7-12-17  4-6-18

*Not more than 9 hours of electives may be in the advanced ROTC. At least 15 hours of electives must be selected from the humanities electives on page 34. Among these electives the second year of German and the first year of French or Russian are recommended. For non-technical electives the school of Chemistry recommends Math. 304 (or 305 & 306), 309, 412, and 415. Physics 319, and the sequence 308, 320, 409, and 313.

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.

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: Laubengayer, General Chemistry; Smith and Wood, Laboratory Manual for General Chemistry.

Mr. Stanfield and Staff.

Chem. 107, 108, 109. General Chemistry
3-3-4. Prerequisites: Chem. 107: Satisfactory Placement Examination; Chem. 108: Chem. 107 or B or better in Chem. 101, and consent of staff.

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.

Text: Sienko and Plane, Chemistry.

Staff.

Chem. 110. General Chemistry
3-6-5. Prerequisite: Satisfactory Placement Examinations.

This is an accelerated course with emphasis on chemical equilibrium. The laboratory work will consist mainly of qualitative analysis.

This course makes it possible for the well prepared student to complete freshman chemistry in one quarter. If a grade of C or better is made, credit for Chemistry 108, 109 will be granted. If a grade of D is made, Chemistry 108, 109 or 102, 103 must be taken.

Text: Hogness and Johnson, An Introduction to Qualitative Analysis.

Staff.

Chem. 214, 215. Analytical Chemistry
2-6-4. Prerequisites: Chem. 109, Chem. 110, or Chem. 103 with a grade of C or better.

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


Mr. Flaschka and Mr. Sturrock.

3-3-4. Prerequisite: Chem. 103.

A study of the various classes of organic compounds at an elementary level with emphasis on applications to the textile field.

Text: Seymour, Organic Chemistry.

Mr. Caine and Mr. Kimbrough.
Physico-chemical properties of matter in the gaseous, liquid, and solid states; solutions; equilibrium, kinetics and thermodynamics of chemical reactions, electrochemistry. Text: Daniels and Alberty, Physical Chemistry.
Mr. Spicer, Mr. Eberhardt and Mr. Carpenter.

Chem. 334, 335, 336. Physical Chemistry Laboratory 0-3-1. Prerequisites: Chem. 215.
To be taken concurrently with or following Chem. 331, 332, 333.
Text: Eberhardt, Physical Chemistry Laboratory Notes.
Mr. Eberhardt and Staff.

The principal classes of organic compounds, aliphatic and aromatic, are studied.
Text: Morrison and Boyd, Organic Chemistry.
Mr. Dyer.
Mr. Grovenstein and Mr. Hine.

Chem. 343, 344, 345. Organic Chemistry Laboratory 0-6-2. Prerequisite: Chem. 103 or 109. To be taken concurrently with or following Chem. 340, 341, and 342, respectively. But Chem. 343 is prerequisite to Chem. 344, 345.
Mr. Cox, Mr. Dyer and Mr. Kimbrough.

Chem. 346, 347. Organic Chemistry Laboratory 0-3-1. Prerequisite: Chem. 343. To be taken concurrently with or following Chem. 341 and 342, respectively.

Organic preparations and reactions—similar to, but less extensive than, Chem. 344, 345.

Application of molecular spectroscopy, electron diffraction, x-ray diffraction, neutron diffraction, and magnetic methods to the determination of molecular structure.
Text: Wheatley, The Determination of Molecular Structure.
Mr. Eberhardt.

Chem. 403. Physical Chemistry 3-0-3. Prerequisite: Chem. 333.
A study of the relation of atomic and molecular structure to the physical properties of matter and the nature of chemical bonding.
Text: Cartmell and Fowles, Valency and Molecular Structure.
Mr. Eberhardt and Mr. Royer.

Chem. 405-406. Instrumental Analysis 1-6-3. Prerequisite: Chem. 333.
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.
Text: Willard, Merrit, and Dean, Instrumental Methods of Analysis.
Mr. Flaschka and Mr. Sturrock.

The methods of identification of compounds and characteristic groups are studied.
Mr. Dyer.
Lectures, recitation, and laboratory work on the preparation, properties, and practical application of colloidal substances.
Text: Jirgensons and Straumanis, *A Short Textbook of Colloid Chemistry.* Mr. Topp.

A classroom study of selected topics with emphasis on laws, principles and generalizations; the periodic classifications, atomic structure, natural and artificial radioactivity, valence, complex compounds, and other topics.

Chem. 437, 438, 439. Special Problems 0-6-2. Prerequisites: Chem. 333, Chem. 345.
The instruction will be individual and will include library, conference, and laboratory work.
Text: None. Staff.

A study of the scope and usefulness of some important reactions and theories in organic chemistry.
Mr. Grovenstein and Mr. Hine.

Lectures, independent reading, and discussion of topics relating to the chemistry and metabolism of plant and animal products.

Graduate Courses Offered

<table>
<thead>
<tr>
<th>Chem.</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>631</td>
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<td>Organic Chemistry</td>
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<tr>
<td>633</td>
<td>4, 5</td>
<td>Reactivity, Mechanism, and Structure in Organic Chemistry</td>
<td>3-0-3</td>
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</table>
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. 657 Radiochemistry ................................................................. 3-0-3
Chem. 658 Experimental Radiochemistry .............................................. 1-3-2
Chem. 661, 2, 3 Chemical Thermodynamics .......................................... 3-0-3
Chem. 664, 5, 6 Advanced Inorganic Chemistry ................................... 3-0-3
Chem. 674 Organic Reagents in Analytical Chemistry ......................... 3-0-3
Chem. 700 Master's Thesis .................................................................
Chem. 701, 2, 3 Seminar ....................................................................... 1-0-0
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. 760, 1 Special Topics in Physical Chemistry ............................... 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)


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.

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 students 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.

*On leave.
Other laboratories are completely equipped for undergraduate and graduate teaching and research in the following: highway materials, building materials, sanitary engineering, air pollution, soil mechanics, stress analysis, structural design, and surveying and mapping. The materials, soil mechanics and structural laboratories are located in the State Highway Department and Georgia Institute of Technology Joint Research and Testing Laboratories Building on the campus.

**Freshman Year**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<tr>
<td>Chem. 101-2-3</td>
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<td>Composition and Rhetoric</td>
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<td>Eng. 105</td>
<td>Introduction to Literature</td>
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**NOTE:** Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

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.

**Most students must take 3 basic ROTC courses. For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin. (Students who are exempt from ROTC take 3 hours of electives.)

**Sophomore Year**

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<td>C.E. 2-1-2</td>
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**Totals (excluding ROTC)**

**Most students must take 3 basic ROTC courses. For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin. (Students who are exempt from ROTC take 3 hours of electives.)

**Students who are exempt from C.E. 203, Surveying Camp, take C.E. 310. See course description for C.E. 203 and C.E. 310.**
### Junior Year

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<td>Materials of Construction</td>
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<td>C.E. 321-23</td>
<td>Fluid Mechanics I, II</td>
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<td>C.E. 415</td>
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<td>C.E. 431</td>
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<td>Economics</td>
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<td>I.M. 329</td>
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*Selected from list on page 34.

### Senior Year

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<td>Advanced Surveying</td>
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<td>C.E. 320</td>
<td>Fluid Mechanics Laboratory</td>
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<td>C.E. 403</td>
<td>Construction</td>
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<td>C.E. 407</td>
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<td>Soil Mechanics and Foundations</td>
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<td>C.E. 416</td>
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<td>C.E. 424</td>
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<td>Public Speaking or Technical Writing</td>
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<td>15-12-19</td>
<td>15-9-18</td>
<td>14-12-18</td>
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</tbody>
</table>

*Students who take C.E. 203, Summer Surveying Camp, 6 credits, omit C.E. 310. See course description for C.E. 203.

**Nine hours of elective course work in Civil Engineering or another field must be chosen when preregistering for the first quarter of the senior year or before taking the first of such electives. Forms for use in requesting approval of an elective sequence are available in the office of the School of Civil Engineering. The elective sequence must lead to some goal chosen by the student and approved by the Director of the School of Civil Engineering.

### Courses of Instruction

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

**C.E. 201. Plane Surveying**
3-3-4. Prerequisites: Math. 100 or 102. Draw. 113.

The theory and practice of surveying. The care and use of the level, tape and transit. Computation of areas; stadia; topographic mapping; map plotting; measurement of angles and direction; land surveying and construction surveys.

Text: Davis and Foote, *Surveying*.
C.E. 202. Route Surveying
3-3-4. Prerequisite: C.E. 201.
Reconnaissance, preliminary, location and construction surveys for routes; computation of circular, reverse, compound, parabolic and spiral curves; earthwork; the use of the mass diagram; effect of grades, distance and curvature.
Text: Meyer, Route Surveying.

C.E. 203. Surveying Camp, 4 weeks course during summer*. 6 hours credit
Prerequisites: C.E. 201, 202.
Observations on the Sun and Polaris. Calculation of azimuth, time, latitude and longitude. Precise tapping, leveling and triangulation. Topographic and route surveys including the use of photogrammetry. Plane table surveys; adjustment of instruments.
*This course should be scheduled between the Sophomore and Junior years. It is required of all Civil Engineering students except as follows:
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. 310 for C.E. 203.
Text: Same as for C.E. 201 and 202 plus Eichler and Tubis, Photogrammetry Lab Kit.

C.E. 204. Elementary Surveying
1-3-2. Prerequisites: Math. 100 or 101, 102. For non-C.E. students. Not offered winter quarter.
The use and maintenance of the level, transit and tape; surveying principles, including leveling, angles, direction, areas, traverses, stadia, topographic mapping, construction surveys and mechanical layout.
Text: Brinker and Taylor, Elementary Surveying.

C.E. 210. Civil Engineering Applications of Digital Computers
0-3-1. Prerequisite: Math. 104.
A study of the application of digital computers to the solution of Civil Engineering problems. Exercises will use an algebraic compiler language and selected numerical methods.
Text: Selected manuals.

C.E. 302. Civil Engineering Seminar
0-3-1. Prerequisite: Junior standing.
Lectures, discussions and reports on current Civil Engineering projects and problems, including engineering ethics, professionalism, introductions to the specialties in civil engineering and introductions to civil engineering contemporary literature.
Text: Fogel, Introduction to Engineering Computations.

C.E. 305. Structural Analysis I
3-0-3. Prerequisites: Mech. 334.
Determination of forces and moments resulting from fixed and moving load systems on statically determinate structures; emphasis placed on influence lines.
Text: Wilbur and Norris, Elementary Structural Analysis.

C.E. 306. Structural Analysis II
3-3-4. Prerequisites: C.E. 305, or Mech. 343.
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.
Text: Same as for C.E. 305.

C.E. 309. Materials of Construction
3-3-4. Prerequisite: C.E. 302, Mech. 334.
Basic principles of the properties of materials. Physical, chemical and mechanical properties of metals, concrete, timber, masonry and asphalt. The laboratory period is for tests, demonstrations and writing reports.
C.E. 310. Advanced Surveying
4-6-6. Spring Quarter. Prerequisites: C.E. 202. For C.E. students exempt from C.E. 203, Summer Surveying Camp.

Field Astronomy; Precise taping, leveling and triangulation. Errors and adjustments of observations. Adjustment of instruments. Division of land areas. Elements of photogrammetry, stereoscopic instruments, mosaics.

Texts: Davis and Foote, Surveying; Eichler and Tubis, Photogrammetry Laboratory Kit.

C.E. 320. Fluid Mechanics Laboratory
0-3-1. Prerequisite: C.E. 323.

Experiment, demonstration and analysis of basic fluid phenomena and exercise in laboratory techniques.

Text: Carstens and Jones, Laboratory Manual.

C.E. 321. Fluid Mechanics I
3-3-4. Prerequisite: Mech. 308.

Elementary mechanics of fluids with emphasis on analysis. Fluid statics; fluid kinematics; equations of motion; energy equation; momentum principle; flow of liquids in pipes. The laboratory period is for supervised computation.


C.E. 323. Fluid Mechanics II
3-0-3. Prerequisite: C.E. 321.

Continuation of C.E. 321. Fluid measurements; uniform and non-uniform flow in open channels; principles of dynamic similitude; principles of selection and performance of pumps and turbines.

Text: Same as for C.E. 321.

C.E. 324. Elements of Fluid Mechanics
3-3-4. Prerequisites: Mech. 308. For non-C.E. students.

Elementary mechanics of fluids in a single comprehensive course. Fluid statics; flow of ideal and real fluids; impulse-momentum principle; flow of incompressible fluids in pipes; fluid measurements. The laboratory period is for lecture, laboratory demonstration and supervised computation.


C.E. 400. Reinforced Concrete Design
3-0-3. Prerequisite: C.E. 406. No credit for C.E. students.

Analysis and design of reinforced concrete foundations, slabs and building frames.

Text: Same as for C.E. 406.

C.E. 403. Construction
2-3-3. Prerequisite: Senior standing. Restricted to C.E. students.

The relations of construction to design and ultimate use; the construction contract; basic machinery and construction operations; job planning, estimating; cost accounting; preparation of bids. The laboratory is for supervised problems and inspection trips.


C.E. 406. Reinforced Concrete Design
2-2-3. Prerequisites: C.E. 305, or Mech. 343; C.E. 309 or Arch. 324.

Principles of design of structural elements including beams, columns, and slabs; consideration of bond stresses, diagonal tension effects, and web reinforcement; application to the design of elementary structures.

Text: Ferguson, Reinforced Concrete Fundamentals.

C.E. 407. Metal Structural Design
2-2-3. Prerequisites: C.E. 305 and C.E. 309.

Principles of design of tension and compression members, beams, riveted and welded connections; application to the design of elementary structures.

Texts: Gaylord and Gaylord, Design of Steel Structures; American Insti-
tute of Steel Construction, *Steel Construction Manual*.

**C.E. 409. Soil Mechanics and Foundations**
4-3-5. Prerequisites: Mech. 334, C.E. 309 or Arch. 322, 323, 324.

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.


**C.E. 412. Applied Soil Mechanics**
1-3-2. Prerequisite: C.E. 409. Spring Quarter.

The application of soil mechanics principles to problems in design. Planning and execution of soil investigations, foundation bearing capacity and structural settlement analyses, and field tests for foundation design. Laboratory period is for inspection trips and design problems.


**C.E. 413. Structural Analysis III**
2-3-3. Prerequisite: C.E. 306. Fall and Winter Quarters.

Structural analysis using electronic digital computers; programming methods; flexibility and stiffness concepts; matrix notation. The laboratory period is for supervised computation.

**C.E. 415. Sanitary Engineering I**
3-3-4. Prerequisite: Chem. 103, C.E. 321.

Introduction to public health engineering. The engineering theory and the public health, legal and economic factors involved in the development of sources of public and industrial water supplies; design and construction of distribution systems; principles of design and operation of water treatment works. The laboratory period is for supervised design problems and inspection trips.


**C.E. 416. Sanitary Engineering II**
3-3-4. Prerequisite: C.E. 431. Co-requisite: C.E. 323.

Sanitation; rural sewage disposal; occupational health; quantity and quality of sewage and industrial wastes; theory of design and construction of collection works for sanitary and storm sewage; principles of design and operation of sewage and industrial waste treatment plants. The laboratory period is for supervised design problems and inspection trips.

Text: Babbitt and Baumann, *Sewerage and Sewage Treatment*.

**C.E. 424. Transportation Engineering**
5-3-6. Prerequisites: C.E. 202, C.E. 309.

The history, economics, design and construction of roads and highways; urban and rural traffic problems; the fundamentals of air, 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.

The economics of highway construction, operation and maintenance; methods of financing.

**C.E. 431. Hydrology**
3-0-3. Prerequisites: C.E. 302, 321.

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 Brader, *Hydrology*.

**C.E. 433. Applied Hydraulics**  
3-0-3. Prerequisites: C.E. 323, C.E. 431. Fall Quarter.  
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.  

**C.E. 438. Elementary Aerial Photogrammetry**  
2-3-3. Offered Fall Quarter only. Prerequisite: C.E. 203 or C.E. 310 or consent of instructor.  

**C.E. 439. Structural Design**  
5-3-6. Prerequisites: C.E. 306, 406, 407.  
Integrated design of structures in metal and concrete. Typical topics: buildings, bridges, plate girders, plastic design in steel, ultimate strength design in concrete, concrete foundations and retaining walls.  
Texts: Same as for C.E. 406 and C.E. 407.

**C.E. 440. Water Treatment**  
3-0-3. Prerequisite: C.E. 415. Fall Quarter.  
Quality and conditioning of municipal and industrial water supplies; clarification, softening, filtration, disinfection, corrosion control and miscellaneous treatment.  

**C.E. 441. Sewage and Industrial Waste Treatment**  
3-0-3. Prerequisite: C.E. 416. Winter Quarter.  
The theory and principles of sewage and industrial waste treatment for water pollution control; principles of design and operation of treatment plants.  

**C.E. 442. Applied Hydrology**  
3-0-3. Prerequisites: C.E. 323, 431. Winter Quarter.  
Applications of hydrology in the design of hydraulic structures for water supply, irrigation, power, drainage and flood control facilities, with attention to groundwater as well as surface water phenomena.

**C.E. 443. Water Resources Development**  
3-0-3. Prerequisites: C.E. 323, 431, or consent of instructor. Spring Quarter.  
Identification and evaluation of problems related to comprehensive water resources development, including flood management, hydroelectric power, navigation, water quality management, irrigation, and other objectives. Attention to socioeconomic and policy implications.

**C.E. 444. Special Problems**  
1 Credit.
C.E. 445, 446. Special Problems
2 Credits. Prerequisite: Senior standing.

Minor research or special problems involving analytical or experimental investigations to develop student initiative and technique under general supervision.

C.E. 447. Engineering Astronomy
2-3-3. Prerequisite: Math. 203. Winter Quarter.

Study of the celestial sphere including the horizon system, equator system and angular measurements. Study of the Sun, Moon, Earth and planets, including man's early theories of the universe. Study of time and the calendar. Determination of time, latitude, longitude and azimuth. Trips will be made to the Agnes Scott College Observatory.

C.E. 448. Design in Timber and Prestressed Concrete
2-3-3. Prerequisite: C.E. 406. Spring Quarter.

Use of prestressed concrete and timber in structural design. Typical topics: Methods of prestressing concrete; analysis and design of structural elements of prestressed concrete and timber; design of joints in timber structures.

C.E. 449. Engineering Aspects of Environmental Health
3-0-3. Prerequisite: Biol. 428 or consent of instructor.

The functions and practices of local, state and federal health agencies; engineering control of insects, rodents and vermin; refuse disposal; swimming pools and recreational areas; housing; and engineering analysis in problems of epidemiology, industrial hygiene and atmospheric pollution, and water supply and waste disposal.

Graduate Courses Offered

C.E. 601 Advanced Aerial Photogrammetry........................................... 2-3-3
C.E. 602 Photographic Interpretation.................................................. 1-3-2
C.E. 603 Geodetic Engineering............................................................... 2-3-3
C.E. 604 Legal Principles of Land Surveying......................................... 2-3-3
C.E. 605 Dock, Harbor and Shore Structures......................................... 3-0-3
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C.E. 613 Reinforced Concrete Structures I............................................. 4-0-4
C.E. 614 Structural Planning................................................................. 3-0-3
C.E. 615 Structural Research Techniques.............................................. 2-6-4
C.E. 621 Indeterminate Structural Theory I............................................ 4-0-4
C.E. 622 Indeterminate Structural Theory II........................................... 3-0-3
C.E. 625, 6 Steady Flow in Open Channels I and II................................ 3-0-3
C.E. 627 Flow in Enclosed Conduits..................................................... 3-0-3
C.E. 628 Sedimentation and Sediment Transport................................... 3-0-3
C.E. 632 Water Power Engineering....................................................... 3-0-3
C.E. 633 Intermediate Fluid Mechanics................................................ 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. 649 Urban Sanitary Facilities....................................................... 2-3-3
C.E. 650 Urban Transportation Facilities and Policies............................ 3-3-4
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<th>Credits</th>
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<td>C.E. 651</td>
<td>Industrial Wastes Treatment and Disposal</td>
<td>2-0-2</td>
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<tr>
<td>C.E. 652</td>
<td>Air Pollution, Measurements and Control</td>
<td>3-3-4</td>
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<tr>
<td>C.E. 653</td>
<td>Analytical Methods for Air Pollution Studies</td>
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<tr>
<td>C.E. 654</td>
<td>Highway Transportation IV</td>
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<td>C.E. 655</td>
<td>Asphalt Mix Design</td>
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<td>C.E. 656</td>
<td>Pavement Design</td>
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<td>C.E. 662</td>
<td>Materials and Design for Radiation Shielding</td>
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<td>C.E. 670</td>
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<tr>
<td>C.E. 671</td>
<td>Plastic Design in Steel</td>
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<td>C.E. 676</td>
<td>Physical and Physico-Chemical Properties of Soil</td>
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<td>Soil Construction</td>
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<td>C.E. 678</td>
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<td>C.E. 680</td>
<td>Detection of Radionuclides in Water</td>
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<td>C.E. 727</td>
<td>Theoretical and Applied Soil Mechanics I</td>
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<td>C.E. 730</td>
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<td>C.E. 737</td>
<td>Gravity-Wave Phenomena</td>
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<tr>
<td>C.E. 800</td>
<td>Doctor's Thesis</td>
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</table>

(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)
Almost every part of our society is influenced by the work of electrical engineers. They have long pioneered the fields of control, power, and communication and without controlled electricity, industry as we know it simply could not exist. Today electricity and electronics are expanding anew into the non-industrial world — into commerce, medicine, astronomy, and a seemingly endless array of diverse areas. The large-scale computer is becoming almost as familiar a sight in the insurance company office as it is in the scientific laboratory. The revolutionary achievements of the past have made electricity the servant of society. There is every reason to believe that the achievements of electrical engineering will be even more revolutionary in the future.

The School of Electrical Engineering offers a program that prepares its graduates to enter any phase of electrical engineering. Accordingly, all students are required to master the fundamentals of mathematics, physics, and electrical theory. Mastery of these fundamentals enables the student to learn quickly the techniques that are necessary for any special job. Moreover, a thorough, mastery of fundamental concepts puts the student in a position to help extend knowledge in his own special field or even originate new fields that are unknown at the present.

Laboratory work is included, where appropriate, in the electrical engineering program to accustom the student to the use of electrical equipment and to develop his skill in practice as well as theory. Finally, a broad range of humanistic studies is included to help the engineer recognize and fulfill his responsibilities as a citizen and at the same time to prepare him for the day when he may leave strictly engineering work to assume administrative responsibilities.

The School of Electrical Engineering requires a scholastic average of C in the prescribed courses in mathematics, physics and electrical engineering. Students who fail to meet this requirement may continue in the School only on a probationary status.

*On leave.
## Courses of Instruction

### Freshman Year

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<thead>
<tr>
<th>Course No.</th>
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<td>Inorganic Chemistry</td>
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<tr>
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<td>Engineering Graphics</td>
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<tr>
<td>Eng. 101-2</td>
<td>Composition and Rhetoric</td>
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<td>Eng. 105</td>
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<td>Math. 100</td>
<td>Algebra-Trigonometry</td>
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<td>Math. 104</td>
<td>Analytical Geometry-Calculus</td>
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<td>Math. 201</td>
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<tr>
<td>M.L. *</td>
<td>Modern Language OR</td>
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<tr>
<td>S.S. 111-12-13</td>
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<td>P.T. 101-2-3</td>
<td>Physical Training</td>
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**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.

**For course numbers and descriptions see the appropriate ROTC sections of this Bulletin. Only 6 credit hours of basic ROTC may be applied toward meeting degree requirements.

### Sophomore Year

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<thead>
<tr>
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<tr>
<td>E.E. 205-6</td>
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<td>Eng. 201-2-3</td>
<td>Survey of the Humanities</td>
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<td>Math. 202-3</td>
<td>Calculus</td>
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<td>Math. 304</td>
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<td>Phys. 207-8-9</td>
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<td>I.M. 204</td>
<td>Economics</td>
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**Totals** 19-8-20 18-11-20 18-11-20

**For course numbers and descriptions see the appropriate ROTC sections of this Bulletin. Only 6 credit hours of basic ROTC may be applied toward meeting degree requirements.

### Junior Year

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<td>E.E. 304-5-6</td>
<td>Engineering Electronics</td>
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<td>E.E. 308</td>
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<td>E.E. 342</td>
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<td>Eng. 315</td>
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**Totals** 11-6-19 14-9-20 11-6-16

*Humanities elective must be selected from the approved list on page 34 of this bulletin.
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</table>

**Of the 36 hours of electives in the junior and senior years, at least 11 hours must be in electrical engineering courses at the 400 level or above. A maximum of nine hours of these electives may be in advanced ROTC courses.**

### 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. Prerequisites: Physics 207, M. 201.


Text: Lecture notes. Mr. White.

**E.E. 206. Elements of Electrical Engineering**

2-3-3. Prerequisite: Physics 208, M. 202.

An introduction to the theory of electric and magnetic fields.

Text: Lecture notes. Mr. Hurd.

**E.E. 304. Engineering Electronics**

3-3-4. Prerequisite: E.E. 206.

A basic study of the electronic structure of matter related in particular to the conduction process and other processes which govern the behaviour of solid state electronic devices and of electron tubes.

Text: Sproull, Modern Physics.

Mr. Hurd.

**E.E. 305. Engineering Electronics**

3-3-4. Prerequisites: E.E. 304, 311.

An introduction to electronic circuits. Includes a study of equivalent plate circuits, amplifiers, rectifier systems, thyatron and phototube circuits. Lectures, recitation, computing, and laboratory periods.

Text: Angelo, Electronic Circuits.

Mr. Hurd.

**E.E. 306. Engineering Electronics**

3-3-4. Prerequisite. E.E. 305.

A continuation of E.E. 305. Includes a study of oscillators, modulation and detection, transistors, and transistor circuits. Lectures, recitation, computing and laboratory periods.

Text: Angelo, Electronic Circuits.

Mr. Hurd.

**E.E. 308. Electric Fields and Waves**

3-0-3. Prerequisites: E.E. 206, 312.

An introduction to electromagnetic theory, including the study of vector analysis, static electric and magnetic fields, and related phenomena.

Text: Moon and Spencer, Foundations of Electrodynamics.

**E.E. 311, 312, 313. Electric Circuits**

3-3-4. Prerequisites: E.E. 205, Math. 304 or parallel.

A study of the transient and steady-state responses of RLC networks to a variety of types of forcing functions. Solutions of the differential equations for dynamic equili-
brium lead to the concepts of complex impedance and complex frequency. These results are used to analyze single-phase and three-phase circuits, resonant circuits, coupled circuits and others of special interest. Introductions to Laplace transforms and Fourier integrals are included. Texts: Guillemin, *Introductory Circuit Theory*. Van Valkenburg, *Network Analysis. Notes*. Mr. Su.

**E.E. 315. Mechanical Plant of Buildings**  
3-0-3. Prerequisite: Senior Architecture standing. Not to be scheduled for credit if credit for E.E. 331 has been earned.  

**E.E. 325. Electric Circuits and Fields**  
2-3-3. Prerequisite: Physics 208. For non-electrical Engineering students. Not to be scheduled for credit if credit for E.E. 320 or E.E. 316 has been earned.  
A study of magnetic and electric fields; electric circuits with a-c or d-c excitation. Lectures, recitations, computation and laboratory periods. Text: E. E. notes. Mr. Wallace.

**E.E. 326. Elementary Electronics**  
2-3-3. Prerequisite: E.E. 325. For non-electrical Engineering students. Not to be scheduled for credit if credit for E.E. 322 has been earned.  
This course is an introduction to electronic and semiconductor devices and includes a study of circuits containing these elements, such as amplifiers and oscillators. Text: E. E. notes. Mr. Wallace.

**E.E. 327. Electric Power Conversion**  
2-3-3. Prerequisite: E.E. 325. For non-electrical Engineering students. Not to be scheduled for credit if credit for E.E. 321 or E.E. 317 has been earned.  

**E.E. 328. Electronic Control**  
3-3-4. Prerequisites: E.E. 326 and E.E. 327. For non-electrical Engineering students. Not to be scheduled for credit if credit for E.E. 322 has been earned.  

**E.E. 342. Electrical Measurements**  
3-3-4. Prerequisite: E.E. 312, or concurrently.  
This course includes the modern methods of measuring resistance, current, capacitance, inductance and iron losses, and the calibration of electrical instruments. Lectures, recitations, computing and laboratory periods. Text: Stout, *Basic Electrical Measurement*. Mr. Nottingham.

**E.E. 408. Electrical Control Systems**  
3-3-4. Prerequisite: E.E. 413 or parallel.  
This course deals with systems of electromagnetic and electronic control of electrical machinery, including such special machines as the amplidyne, rototrol, amplistat, sel-syn, and electronic drive. Lectures, recitations, computing and laboratory periods. Text: R. W. Jones, *Electrical Control Systems*. Mr. Weston.
A continuation of E.E. 308. Includes a study of Maxwell's Equations, electromagnetic waves, and distributed parameter circuits.
Text: Johnson, Transmission Lines and Networks.
Mr. Fielder.

A continuation of E.E. 409. Includes a study of radiation and antennas.
Texts: Kraus, Electromagnetics.
Mr. Fielder.

A study of electromechanical energy conversion methods and devices. Includes a study of transformers, rotating machinery and transducers.
Mr. Weston.

A continuation of E.E. 313. Laplace transformers and Fourier integrals are used to study the behavior of electric and electromechanical systems.
Text: Cheng, Analysis of Linear Systems.
Mr. Fielder.

A basic study of closed-loop systems utilizing frequency response analysis. Synthesis techniques are developed for desired performance criteria. Electrical, mechanical and hydraulic systems are considered.
Text: Thaler and Brown, Servomechanism Analysis.
Mr. Hammond.

A study of the basic principles of analog computation.
Text: Johnson, Analog Computer Techniques.
Mr. Hammond.

A study of the theory and design of pulse circuits with applications to electronic computers, radar and television circuits.
Text: Strauss, Wave Generation and Shaping.
Mr. Jones.

A study of power system parameters, fault currents, stability and protective relaying.
Text: Stevenson, Power System Analysis.
Mr. Weston.

Theory and operating characteristics of electronic power conversion and industrial electronic control devices. Laboratory and problem work are included.
Text: To be selected.
Mr. Nottingham.

An analytical study of radio circuit components, audio- and radio-frequency amplifiers, oscillators, radio-frequency power amplifiers, modulators and detectors. A study of transmitting and receiving systems including frequency-modulation, amplitude-modulation, and television. Some emphasis is placed on the in-
herent problem involving frequency-allocation, interference, and propagation. Lectures, recitation, computing and laboratory periods.


**E.E. 432. Communication Circuits**

3-3-4. Prerequisite: E.E. 313.

A study of communication circuits and electric filters. Lectures, recitations, computing and laboratory periods.

Text: Kuh and Pederson, *Principles of Circuit Synthesis*. Mr. Fielder

**E.E. 434. High-Frequency Measurements**

3-0-3. Prerequisites: E.E. 342 or parallel.

A study of the techniques employed in the measurement of voltage, current, power, inductance, resistance and capacitance at audio and radio frequencies.

Text: To be selected.

Mr. Hutchison.

**E.E. 435. Transistor Circuit Analysis**

3-3-4. Prerequisites: E.E. 306, 313.

After a short review of transistor parameters and equivalent circuits, quiescent-point and stability considerations are discussed. The analysis and design of both small-signal and large-signal amplifiers, transistor oscillators, modulators and pulse circuits are studied.


**E.E. 436. Ultra-High-Frequency Techniques**

3-3-4. Prerequisite: E.E. 409.

A study of high frequency amplifiers, oscillators and metallic and dielectric wave guides.


**E.E. 441. Illumination**

3-3-4. Prerequisite: E.E. 313.

A course dealing with the scientific principles of illumination. Light sources and their application in industrial and commercial areas. Some emphasis is placed on building wiring, the National Electrical Code, and electrical specifications: Lectures, recitation, computing and laboratory periods.


**E.E. 442. Electrical Design**

3-3-4. Prerequisites: E.E. 413 or parallel.

Design problems of various types of apparatus involving the electric and magnetic circuits. Lectures and computing periods.


**E.E. 452-453-454. Special Problems**

0-3-1. Prerequisite: Senior E.E. standing.

Special engineering problems will be assigned to the student according to his needs and capabilities.

Text: None. Staff.

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**Graduate Courses Offered**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.E. 605</td>
<td>Symmetrical Components</td>
<td>3-3-4</td>
</tr>
<tr>
<td>E.E. 608</td>
<td>Power System Relaying</td>
<td>3-3-4</td>
</tr>
<tr>
<td>E.E. 609</td>
<td>Digital Control Circuits</td>
<td>3-0-3</td>
</tr>
<tr>
<td>E.E. 622,3</td>
<td>Advanced Electrical Transients</td>
<td>3-0-3</td>
</tr>
<tr>
<td>E.E. 624</td>
<td>Advanced Electrical Measurements</td>
<td>3-3-4</td>
</tr>
<tr>
<td>E.E. 625, 6, 7</td>
<td>Feedback Control Systems</td>
<td>3-3-4</td>
</tr>
<tr>
<td>E.E. 628</td>
<td>Transmission Lines</td>
<td>3-3-4</td>
</tr>
<tr>
<td>E.E. 632</td>
<td>Transistor Circuits</td>
<td>3-0-3</td>
</tr>
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</table>
F.E. 634 Antenna Systems ................................................................. 4-3-5
F.E. 638 Random Processes ............................................................ 3-0-3
F.E. 639 Electromagnetic Theory ................................................... 3-0-3
F.E. 640 Wave Guides and Cavity Resonators ............................... 3-0-3
F.E. 647 Communication Circuits and Signals ............................... 3-0-3
F.E. 648 Modulation Theory ......................................................... 3-0-3
F.E. 649 Noise in Communications Systems ................................. 3-0-3
F.E. 650 Power System Stability .................................................. 3-0-3
F.E. 659 Information Theory ....................................................... 3-0-3
F.E. 660 Optimum Linear Filters ................................................. 3-0-3
F.E. 661 Decision Theory ............................................................ 3-0-3
F.E. 662, 3, 4 Advanced Network Theory ..................................... 3-3-4
F.E. 668 Statistical Theory of Measurements ................................ 3-0-3
F.E. 671 Hydromagnetics ............................................................. 3-0-3
F.E. 672 Gaseous Electronics ....................................................... 3-0-3
F.E. 673 Gaseous Discharges ....................................................... 3-0-3
F.E. 677, 8, 9 The Physical Basis of Electronic Devices ............... 3-0-3
F.E. 680 Tenor Analysis of Circuits ............................................. 3-0-3
F.E. 681 Advanced Machinery ...................................................... 3-0-3
F.E. 682 Advanced Machinery ...................................................... 3-0-3
F.E. 700 Master's Thesis .............................................................
F.E. 701, 2, 3 Seminar .................................................................. 1-0-0
F.E. 704, 5, 6 Special Problems ................................................... Credit to be arranged
F.E. 716 Traveling-Wave Voltages Due to Lighting ....................... 3-0-3
F.E. 718 Non-Linear Random Processes ....................................... 3-0-3
F.E. 729 Advanced Electronics ...................................................... 5-0-5
F.E. 734, 5, 6 Oscillators .............................................................. 3-0-3
F.E. 745, 6, 7 Advanced Electromagnetic Theory ......................... 3-3-4
F.E. 750 Advanced Analysis of Automatic Control Systems .......... 4-3-5
F.E. 751 Random Processes in Automatic Control Systems ............ 3-0-3
F.E. 762, 3, 4 Advanced Communication Theory II ...................... 3-0-3
F.E. 800 Doctor's Thesis ...............................................................
Department of Engineering Graphics

Department Head—R. Kenneth Jacobs; Associate Professor—Joseph C. Durden, Jr.; Assistant Professors—Ishmael L. Ellis, John D. Hutcheson; Lecturers—Joseph W. Adams, Everard M. Heim, Theodoric C. Linthicum, Donald H. Smith, Robert H. Smith, Earl M. Wheby; Teaching Assistants—Charles D. Clark, John G. Nevitt, Hardy J. Smith, James H. Starnes; Secretary—Sarah V. Dollar.

General

Graphics has long been a language of the Engineer. It has endured through the years because it is the most flawless means of communication yet invented by man. Where the spoken word or the written document is always subject to misinterpretation, a well executed graphical analysis conveys the thought or plan exactly as intended.

As the line of demarcation between the efforts of engineers and scientists continues to diminish, it becomes increasingly imperative that rapid communication between them be extended and improved. Engineering Graphics, or Graphic Science, not only supplies the common language linking the closely oriented fields of engineering and science, it also takes on the added task of providing the engineer with means of expression in his newer role in the area of analysis and synthesis without relinquishing his command in design, which has long been his primary responsibility. This nowise ignores the cultural attainments arising from study in this discipline which, for many, initiates first steps into our modern and ever changing world of precise measurements, spatial relationships, and clear thinking.

To visualize in three dimensions and to express thoughts and ideas in concise form readily understood by those conversant with the common language is one of the essentials for growth in engineering and allied sciences. Setting a climate conducive to the student's development in this phase of his education is the aim and purpose of the department.

While all students at Georgia Tech do not pursue identical courses in Graphics, since the subject matter is suited to specific needs of the various disciplines, it is expected that the able student will reach that level of graphics literacy whereby he may live comfortably within his professional environment.

Courses of Instruction

Note: 4-3-5 means 4 hours class, 3 hours laboratory, 5 hours credit. Students are expected to use drawing instruments approved by the Department of Engineering Graphics.

E.Gr. 103. Graphic Presentation
0-6-2. Prerequisite: None. Not open to students with credit in Draw. 101 or E.Gr. 113.

Topics of study include lettering; the use of instruments; geometric construction; dimensioning; pencil drawing and ink tracing techniques; theory and construction of charts and graphs for technical data and business trends in industry. Text: Schmid, Handbook of Graphic Presentation, and Departmental Notes.
E.Gr. 106. Charts and Graphs
0-6-2. Prerequisite: Draw. 101 or E.Gr. 113.

Topics of study include working drawings; operational drawings and specifications; theory and construction of charts and graphs used to present technical data and trends in business.

E.Gr. 113. Engineering Graphics
0-6-2. Prerequisite: None.

Topics of study include lettering (capital and lower case); the use of instruments; geometric construction; orthographic projection; emphasis on descriptive geometry concepts as applied to the solution of problems involving orthographic projection of solids, auxiliary views, and points, lines and planes.

E.Gr. 114. Engineering Graphics
0-6-2. Prerequisite: E.Gr. 113.

Topics of study include the solution of problems involving points, lines, and planes by use of the revolution method; intersection of surfaces; development of surfaces; warped surfaces; Practical applications are emphasized.

E.Gr. 115. Engineering Graphics
0-6-2. Prerequisite: E.Gr. 114.

Topics of study include sections and conventions; dimensioning; pictorial representation; detail sketches; shop processes; assembly drawings from detail sketches; working pictorial sketches; introduction to charts and graphs; reproduction processes, ink tracing on cloth; graphical calculus.

NOTE: E.Gr. 105, E.Gr. 106, E.Gr. 113, E.Gr. 114, and E.Gr. 115 are listed in the curricular sections of this catalogue as Draw. 105, Draw. 106, Draw. 113, Draw. 114, and Draw. 115.
School of Engineering Mechanics

Director—Milton E. Raville; Professors Emeritus—William B. Johns, Jr., Phil Blasier Narmore; Professors—Helmut F. Bauer, Bryan T. Brown, Francis M. Hill, Jakob Mandelker, Andrew W. Marris, Charles E. Stoneking; Associate Professors—James H. Armstrong, Francis C. Bragg, William J. Lnenicka; Assistant Professors—John C. Clark, Jose Villanueva, James T. Wang, Ira E. Wilks; Secretary—Barbara C. Martinez.

General

Engineering Mechanics has long been recognized as a fundamental of engineering, and all engineering curricula include some courses in mechanics. Recent advances in science and technology are creating problems which are demanding for their solution the direct application of fundamental principles of mechanics in the hands of a trained analyst. The course of study offered here provides both breadth and depth through a strong foundation in mathematics, basic electricity and electronics, dynamics and vibration, advanced strength of materials, theoretical and experimental stress analysis. Successful completion of the program outlined should enable the graduate to enter upon a career in any one of a number of different phases of engineering or to fit into a research program. An excellent background is also provided for further study at the graduate level.

A minimum scholastic average of C is required in the prescribed courses in mathematics, physics and engineering mechanics. Students who fail to meet this requirement may continue only on a probationary status.

A modern well-equipped laboratory is maintained for experimentation and demonstration in the field of experimental stress analysis. There is an air conditioned dark room and the required equipment for photoelastic studies and experiments. The necessary machines for production of models and specimens are available.

Successful completion of the following program leads to the degree of Bachelor of Science in Engineering Mechanics.
### Freshman Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem. 101-2-3</td>
<td>General Chemistry</td>
<td>3-3-4</td>
<td>3-3-4</td>
<td>3-3-4</td>
</tr>
<tr>
<td>Draw. 113-14-15</td>
<td>Engineering Graphics</td>
<td>0-6-2</td>
<td>0-6-2</td>
<td>0-6-2</td>
</tr>
<tr>
<td>Eng. 101-2</td>
<td>Composition and Rhetoric</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<tr>
<td>Eng. 105</td>
<td>Introduction to Literature</td>
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<tr>
<td>Math. 100</td>
<td>College Algebra and Trigonometry</td>
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<tr>
<td>Math. 104</td>
<td>Analytical Geometry and Calculus</td>
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<td>5-0-5</td>
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<tr>
<td>Math. 201</td>
<td>Calculus</td>
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<td>5-0-5</td>
</tr>
<tr>
<td>M.L.*</td>
<td>Modern Language, OR</td>
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</tr>
<tr>
<td>S.S. 111-12-13</td>
<td>Social Science</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<tr>
<td>P.T. 101-2-3</td>
<td>Physical Training</td>
<td>0-4-1</td>
<td>0-4-1</td>
<td>0-4-1</td>
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<tr>
<td>Gen. 101</td>
<td>Orientation</td>
<td>1-0-0</td>
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</tbody>
</table>

Totals (excluding ROTC**) 15-13-18 14-13-18 14-13-18

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

*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.

**Most students must take two years of basic ROTC. For further details see page 30. For course numbers and credits, see the course descriptions under the appropriate ROTC sections of this Bulletin.

### Sophomore Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<th>3rd Q.</th>
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<tbody>
<tr>
<td>Eng. 201-2-3</td>
<td>Survey of Humanities</td>
<td>3-0-3</td>
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<td>Math. 202-3</td>
<td>Calculus</td>
<td>5-0-5</td>
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</tr>
<tr>
<td>Math. 304</td>
<td>Differential Equations</td>
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<td>5-0-5</td>
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<tr>
<td>Phys. 207-8-9</td>
<td>Physics</td>
<td>5-3-6</td>
<td>5-3-6</td>
<td>5-3-6</td>
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<tr>
<td>M.E. 208</td>
<td>Engineering Materials and Processes</td>
<td>2-3-3</td>
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<td>Mech. 305</td>
<td>Statics</td>
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<td>3-0-3</td>
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<td>Elective*</td>
<td>Humanities</td>
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<tr>
<td>P.T. 201-2-3</td>
<td>Physical Training</td>
<td>0-4-1</td>
<td>0-4-1</td>
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Totals (excluding ROTC) 15-10-18 16-7-18 16-7-18

*Humanities elective must be selected from the approved list on page 34.
### Junior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
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<tr>
<td>Chem. 475</td>
<td>Physical Chemistry for Engineers</td>
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<td>3-0-3</td>
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<tr>
<td>Chem. 476</td>
<td>Chemistry of the Solid State</td>
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<td>3-0-3</td>
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<tr>
<td>Eng. 320</td>
<td>Technical Writing</td>
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<td>3-0-3</td>
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<tr>
<td>Math. 411</td>
<td>Advanced Engineering Mathematics</td>
<td>3-0-3</td>
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<tr>
<td>Phys. 319</td>
<td>Modern Physics for Engineers</td>
<td>3-0-3</td>
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<tr>
<td>Mech. 312-13</td>
<td>Dynamics</td>
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<tr>
<td>Mech. 421</td>
<td>Mechanical Vibrations</td>
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<td>M.E. 322-3</td>
<td>Thermodynamics</td>
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<tr>
<td>E.E. 325</td>
<td>Electrical Circuits and Fields</td>
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<td>E.E. 326</td>
<td>Elementary Electronics</td>
<td>3-0-3</td>
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<td>6-0-6</td>
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</table>

Totals 16-3-17 17-3-18 18-0-18

*Of the 24 hours of undesignated electives in the junior and senior years, at least 9 hours must comprise a sequence of technical courses leading to some goal. A maximum of 9 hours of these electives may be in advanced ROTC.

### Senior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<tr>
<td>Mech. 401-2</td>
<td>Dynamics</td>
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<td>Mech. 404</td>
<td>Applied Vibration</td>
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<tr>
<td>Mech. 441</td>
<td>Advanced Strength of Materials</td>
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<tr>
<td>Mech. 444</td>
<td>Stress Analysis</td>
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<td>3-0-3</td>
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<tr>
<td>Mech. 445</td>
<td>Introduction to Plasticity</td>
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<tr>
<td>Mech. 471</td>
<td>Introduction to Experimental Stress Analysis</td>
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<td>1-6-3</td>
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<tr>
<td>A.E. 325 or M.E. 310</td>
<td>Fluid Mechanics</td>
<td>3-0-3</td>
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<tr>
<td>Math. 412-13*</td>
<td>Advanced Engineering Mathematics</td>
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<tr>
<td>A.E. 410</td>
<td>Thermal Stresses</td>
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Totals 18-0-18 15-6-17 16-6-18

*Math. 491, Advanced Calculus, (3-0-3) may be substituted for Math. 413.

### Courses of Instruction

#### Engineering Mechanics

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

**Mech. 301. Applied Mechanics**

2-0-2. Prerequisites: Phys. 207; and Math. 201.

Topics of study include elements of statics; laws of equilibrium applied to machines and structures; laws of friction applied to simple machines.  
Mech. 302. Applied Mechanics
Topics of study include elements of rectilinear and curvilinear kinematics, kinetics of particles, and kinetics of translation of bodies with applications.

Mech. 303. Applied Mechanics
3-0-3. Prerequisites: Mech. 302; Math. 203.
Topics of study include kinematics and kinetics of rotating bodies; kinematics and kinetics of plane motion; work, power, energy, and their relationships.

Mech. 304. Applied Mechanics
0-3-1. Prerequisite: One of the following courses: Mech. 301, Mech. 305, Mech. 306 or Mech. 342.
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. Staff.

Mech. 305. Statics
3-0-3. Prerequisites: Phys. 207; Math. 201.
Topics of study include elements of statics in two and three-dimensions; review of centroids and moments of inertia of areas; laws of equilibrium applied to machines and structures; friction.

Mech. 306. Applied Mechanics
Elements of statics in two and three dimensions; laws of equilibrium applied to machines and structures; friction; centroids, centers of gravity, and moments of inertia; kinematics; kinetics of translation, rotation, and plane motion; work-energy and impulse-momentum principles.

Mech. 308. Dynamics
Kinematics of rectilinear and curvilinear motion of particles; kinematics of rotation and plane motion of rigid bodies; kinetics of a particle; kinetics of translation, rotation, and plane motion of bodies; work and energy relations; impulse and momentum principles.

Mech. 312. Applied Mechanics
3-0-3. Prerequisites: Math. 203, Phys. 207.
Review of vector algebra and vector calculus; kinematics and kinetics of particle motion; introductory space mechanics; plane motion of rigid bodies.
Text: To be selected. Staff.

Mech. 313. Applied Mechanics
3-0-3. Prerequisite: Mech. 312.
Mechanics of rigid body motion; the method of impulse and momentum; simple gyroscopic applications; work and energy methods; introduction to vibration theory.
Text: To be selected. Staff.

3-0-3. Prerequisites: Math. 202; Mech. 301 or Mech. 305.
Topics of study include stresses and strains; shear and bending moment diagrams; flexure stresses in beams; torsion; column theory.

2-0-2. Prerequisites: Mech. 301 or Mech. 305; Mech. 331.
Topics of study include deflection of beams; longitudinal shear; combined stresses.

Simple stresses and strains; membrane stresses; torsion; shear and bending moment diagrams; flexure stresses and shearing stresses in beams; plastic bending of beams; combined stresses; deflection of beams; statically indeterminate beams; strain energy and Castigliano's theorems; column theory.

Mech. 337. Mechanics of Materials
3-0-3. Prerequisites: Mech. 332 or Mech. 334; Math. 203.
Topics of study include beam deflections due to bending moment and simple cases of statically indeterminate beams by the conjugate beam concept; beam deflections due to vertical shear; energy of strain; the theorems of Castigliano; impact; statically indeterminate axial stresses; curved beams; thick walled cylinders.

Mech. 342. Statics
Topics of study include coplanar and space force systems; equilibrium of particles and rigid bodies; simple structures; centroids and moments of inertia of areas reviewed; load, shear and bending moment diagrams; parabolic and catenary cables.
Text: Beer and Johnson, Statics. Staff.

Mech. 343. Mechanics of Materials
5-0-5. Prerequisites: Mech. 342.
Topics of study include Hooke's Law; stresses and strains in bars, plates, and beams; mechanical properties of materials; combined stresses with graphical illustration by Mohr's circle; deflection of beams; columns.

Mech. 401. Dynamics
3-0-3. Prerequisite: Mech. 421, or consent of instructor.
Topics of study include particle dynamics; relative motion; motion in resisting medium; exterior ballistics; planetary motion; motion with variable mass.
Text: Timoshenko and Young, Advanced Dynamics. Mr. Hill.

Mech. 402. Dynamics
3-0-3. Prerequisite: Mech. 401, or consent of instructor.
Topics of study include motion of rigid body; three-dimensional motion; LaGrange's equations; vibration of conservative and non-conservative systems.
Text: Timoshenko and Young, Advanced Dynamics. Mr. Mandelker.

Mech. 404. Applied Vibration
3-0-3. Prerequisite: Mech. 421, or consent of the instructor.
Topics of study include mobility method; geared systems; topics in applied vibration; introduction to the vibration of elastic bodies; tabular methods for vibration of beams.
Text: To be selected. Mr. Hill.
Mech. 421. Mechanical Vibrations
3-0-3. Prerequisites: Math. 304 or Math 305; Mech. 303 or 308; Mech. 332 or 334.

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: Thomson, Mechanical Vibrations.

Mr. Hill and Staff.

Mech. 441. Advanced Strength of Materials
3-0-3. Prerequisites: Mech. 332 or Mech. 334; senior standing.

Topics of study include unsymmetrical bending; shear center; the short eccentrically loaded column; further treatment of columns; further treatment of deflection of structural members.

Mr. Lnenicka and Staff.

Mech. 444. Stress Analysis
3-3-4. Prerequisites: Mech. 337 or A.E. 331 or equivalent; Math. 304 or equivalent.

Stress relations for an arbitrary continuous body; introduction to the theory of isotropic elasticity; strain gages and strain measurements; illustrative elasticity solutions for beams; unsymmetrical bending; torsion; shear flows in closed box beams; practical applications to structures.
Text: Notes; text to be selected. Staff.

Mech. 445. Introduction to Plasticity
3-0-3. Prerequisites: Mech. 444 or equivalent; Math. 411.

Stress strain relationships in different types of plastic flow with applications.
Text: Hoffman and Sachs, Theory of plasticity.

Mr. Armstrong and Mr. Stoneking.

Mech. 446. Continuum Mechanics
3-0-3. Prerequisite: Mech. 444 or consent of instructor.

Geometrical foundations; concept of stress and strain tensors; analysis of stress and strain; fundamental physical laws; constitutive equations; introduction to elasticity, plasticity, thermoelectricity, viscoelasticity, wave propagation.

Mr. Wang and Mr. Marris.

Mech. 471. Introduction to Experimental Stress Analysis
1-6-3. Prerequisite: Senior standing.

Topics of study include the elements of two dimensional photoelasticity; the elements of electric resistance strain gage theory and practice; strain recording devices; measurement of damping in simple vibrating systems; introductory study of fatigue.
Text: Notes and references.

Mr. Armstrong and Mr. Hill.

3-0-3. Prerequisite: Senior standing.

Topics of study include fatigue; creep; effect of shape, size, temperature, and microstructure of specimen; the more common stress-strain equations, hysteresis, after effect, etc.; theories of failure. Considerable reading and report writing required.
Text: Notes and References.

Mr. Armstrong.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>Mechanical Vibrations</td>
<td>3-0-3</td>
</tr>
<tr>
<td>Mech. 445</td>
<td>Introduction to Plasticity</td>
<td>3-0-3</td>
</tr>
<tr>
<td>Mech. 446</td>
<td>Continuum Mechanics</td>
<td>3-0-3</td>
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<tr>
<td>Mech. 603</td>
<td>Applied Vibrations</td>
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<tr>
<td>Mech. 604</td>
<td>Dynamics</td>
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<tr>
<td>Mech. 610</td>
<td>Theory of Oscillations</td>
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<tr>
<td>Mech. 613</td>
<td>Vibration of Elastic Bodies</td>
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<tr>
<td>Mech. 615</td>
<td>Gyroscopic Motion and Devices</td>
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<td>Mech. 618</td>
<td>Space Ballistics</td>
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<td>Mech. 620</td>
<td>Theory of Experimental Stress Analysis</td>
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<tr>
<td>Mech. 622</td>
<td>Energy Methods in Mechanics</td>
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<td>Mech. 635</td>
<td>Advanced Strength of Materials</td>
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<td>Mech. 640</td>
<td>Introductory Photoelasticity</td>
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<td>Mech. 643</td>
<td>Photoelasticity</td>
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<td>Mech. 645</td>
<td>Theory of Elasticity</td>
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<td>Mech. 646</td>
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<tr>
<td>Mech. 652</td>
<td>Theory of Plates</td>
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<tr>
<td>Mech. 653</td>
<td>Theory of Elastic Stability</td>
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<tr>
<td>Mech. 654</td>
<td>Theory of Shells</td>
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<td>Mech. 700</td>
<td>Master's Thesis</td>
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<td>Mech. 701, 2, 3</td>
<td>Seminar</td>
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<td>Mech. 704, 5, 6</td>
<td>Special Problems in Engineering Mechanics</td>
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<td>Mech. 710</td>
<td>Space Mechanics</td>
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<td>Mech. 750</td>
<td>Nonlinear Vibrations</td>
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<td>Mech. 760</td>
<td>Theory of Elasticity</td>
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<td>Mech. 764</td>
<td>Stability of Plates and Shells</td>
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</table>

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


General

Fundamental for effective study and successful communication with others is the ability to think logically, to organize material properly, and to express ideas in clear and appropriate English prose. Toward these ends the English courses of the freshman year are primarily directed.

Every student must achieve an acceptable minimum level of writing. Students of exceptional ability, as revealed by their scores on College Board tests, will be placed in Merit sections and challenged to secure credit for three courses in one quarter. Regular students will take three quarters of composition. Students beyond the freshman year whose composition is found to be unsatisfactory may be required to repeat a composition course, even though they have received credit for the course. Transfer students may be required to take a proficiency test in writing before credit is allowed.

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. For students from foreign countrieske a special two-year program serves as an introduction to the American language and the American way of life.

The department offers to all sophomores a unified series of courses in the humanities aimed at a deeper appreciation of the value of the individual in society and a wider acquaintance with the great writers and great ideas basic to an understanding of western culture. Additional elective courses in literature and language are available for juniors and seniors.

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.
Review of essentials of grammar, punctuation, and composition. Recitation, written exercises, quizzes, short themes.

*On leave.
**Eng. 50. Reading for Speed and Comprehension**  
2-0-0. Prerequisite: None.  
Mechanics of reading, exercises in increasing speed and improving comprehension. Recitation, tests, and individual practice.  
Text: Brown, *Efficient Reading*.  
Mr. Almon and Mr. Foote.

**Eng. 101, 102. Composition and Rhetoric**  
3-0-3. Prerequisite: None.  
Analyzing and writing short units of composition efficiently and effectively, with emphasis on methods, relevancy, and adequacy of organization and development.  
A dictionary acceptable to the department.  
Mr. Walker and Staff.

**Eng. 105. Introduction to Literature**  
3-0-3. Prerequisite: English 102.  
Guided analysis of humanistic ideas in selected literary works, with special attention to the relationship of content to form. Lectures, discussions, quizzes, papers.  
Text: McNamee, *Literary Types and Themes*.  
Mr. Walker and Staff.

**Eng. 110. Vocabulary Building**  
3-0-3. Prerequisite: None.  
Development of a useful vocabulary required in technical and scientific courses and general reading. Recitation, written exercises, individual practice and research, quizzes.  
Mr. Mullen.

**Eng. 131-2-3. English for International Students**  
5-0-5. Freshman year, consecutive quarters.  
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.  
A dictionary acceptable to the department.  
Mr. O'Neill.

**Eng. 201-2-3. Survey of the Humanities**  
3-0-3. Prerequisite: Eng. 105.  
A sequence of courses studying the contribution of several western civilizations from the Greeks to modern times as revealed in literature. Lecture, quizzes, report, collateral reading.  
Texts: Selected readings in each period.  
Mr. Walker and Staff.

**Eng. 204. Creative Writing**  
3-0-3. Prerequisite: Eng. 105.  
Study and practice in several forms and methods of composition, with emphasis on effective writing. Recitation, quizzes, compositions.  
Mr. Haman.

**Eng. 221-2-3; 331-2-3. Acting and Producing the Play**  
0-3-1. Prerequisite: Admission by consent of instructor.  
Participation in the production of various kinds of plays, including the presentation of one play before an audience.  
Mrs. Santacroce.

**Eng. 231-2-3. Literature for International Students**  
5-0-5. Sophomore year, consecutive quarters. Prerequisite: Eng. 133.  
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.  
Mr. Spillman and Mr. Foster.
Eng. 301. Modern Drama
3-0-3. Prerequisite: Eng. 203.
Dramatic theory and technique as illustrated by a number of modern playwrights. Lectures, reports, collateral reading, quizzes.
Text: Reinert, *Modern Drama*.
Mr. Chaikin and Mr. Walker.

Eng. 302. Shakespeare
3-0-3. Prerequisite: Eng. 203.
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.
Mr. Adams and Mr. Rubin.

Eng. 303. American Literature
3-0-3. Prerequisite: Eng. 203.
Reading of American writers for form and ideas. Lectures, reports, collateral reading, quizzes.
Text: Selected texts as announced.
Mr. Foster and Mr. Young.

Eng. 304. Contemporary Literature
3-0-3. Prerequisite: Eng. 203.
A careful study of major figures and movements in modern fiction. Lectures, reports, collateral reading, quizzes.
Text: To be announced.
Mr. Haman and Mr. O'Neill

Eng. 306. The English Language
3-0-3. Prerequisite: Eng. 105.
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 and Cassidy, *Development of Modern English*.
Mr. Walker.

Eng. 315. Public Speaking
3-0-3. Prerequisite: Eng. 203.
Instruction in the basic principles of effective public speaking, with emphasis on practice and criticism. The course is conducted as a laboratory.
Mr. Walker and Staff.

Eng. 318. Argumentation and Debate
3-0-3. Prerequisite: Admission by consent of the instructor.
Principles of argumentation and persuasion, with emphasis on issues of current public interest.
Text: To be announced.
Mr. Rainey.

Eng. 320. Technical Writing
3-0-3. Prerequisites: Eng. 203.
Study and practice of effective English in business letters, technical papers, engineering reports. Letters, reports, quizzes.
Mr. Walker and Staff.

Eng. 360. The Literature of the Bible
3-0-3. Prerequisite: Eng. 203.
Study of a number of Biblical selections of unusual literary merit. Lectures, collateral reading, reports, quizzes.
Mr. Ketchin.
School of Industrial Engineering
(Established in 1945)
(Including a Program in Safety Engineering)


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 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 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
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<tr>
<td>Chem.</td>
<td>101-2-3</td>
<td>Inorganic Chemistry</td>
<td>3-3-4</td>
<td>3-3-4</td>
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<td>Draw.</td>
<td>113-14-15</td>
<td>Engineering Graphics</td>
<td>0-6-2</td>
<td>0-6-2</td>
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<td>Eng.</td>
<td>101-2</td>
<td>Composition and Rhetoric</td>
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<td>Eng.</td>
<td>105</td>
<td>Introduction to Literature</td>
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<td>Math.</td>
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<td>College Algebra and Trigonometry</td>
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<td>Math.</td>
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<td>Analytical Geometry and Calculus</td>
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<tr>
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<td>Calculus</td>
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<td>M.L.</td>
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<td>Modern Language OR</td>
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<td>S.S.</td>
<td>111-12-13</td>
<td>Social Science</td>
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<td>P.T.</td>
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<td>Orientation</td>
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**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**

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
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<tr>
<td>I.E.</td>
<td>304</td>
<td>Organization for Production</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<td>I.M.</td>
<td>201-2</td>
<td>Principles of Economics</td>
<td>3-0-3</td>
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<td>Eng.</td>
<td>201-2-3</td>
<td>Survey of the Humanities</td>
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<td>202-3</td>
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**Totals** 19-8-20 19-8-20 19-8-20

*For course numbers, see course descriptions under the appropriate ROTC sections of this Bulletin.
### Junior Year

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<td>Evaluation of Engineering Data</td>
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<td>3-0-3</td>
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<td>I.E. 415</td>
<td>Methods and Systems Analysis</td>
<td>3-6-5</td>
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<td>I.E. 425</td>
<td>Engineering Economy</td>
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<td>I.E. 439</td>
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<td>I.M. 336-7</td>
<td>Accounting and Cost Accounting</td>
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<td>Industrial Psychology</td>
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<td>C.E. 324</td>
<td>Fluid Mechanics</td>
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<td>Applied Mechanics</td>
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<td>Math. 407</td>
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<td>Electives*</td>
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<td>20-0-20</td>
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*Free electives — a maximum of nine credit hours of advanced ROTC may be used.

### Senior Year

<table>
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<tr>
<th>Course No.</th>
<th>Subject</th>
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<td>Production Control</td>
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<td>I.E. 420</td>
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<td>Seminar</td>
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<td>12-9-15</td>
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</table>

### Courses of Instruction

**I.E. 304. Organization for Production**

3-0-3. Prerequisite: Math. 201.

The principles of organization and administration which are applicable to various engineering and industrial enterprises. An elective course for all engineering students.

Text: To be selected. **Staff.**

**I.E. 306. Production Control**


A lecture and problems course covering production control systems, work routing, dispatching, inventory control, stores, etc.

Text: To be selected. **Mr. Franklin and Staff.**
I.E. 311. Manufacturing Processes  
3-0-3. Prerequisite: None.  
A study of modern manufacturing processes and production methods.  
Text: To be selected, visual aids and lecture notes.  
Staff.

I.E. 339. Evaluation of Engineering Data  
3-0-3. Prerequisite: Math. 203 or concurrently.  
Elementary probability theory, descriptive statistics, theoretical probability distributions, statistical inference, point and confidence interval estimation, simple regression and correlation analysis.  
Staff.

I.E. 340. Evaluation of Engineering Data  
3-0-3. Prerequisite: I.E. 339.  
An introduction to the methods of industrial experimentation including the analysis of variance, multiple regression, and design of experiments.  
Text: Duncan, Quality Control and Industrial Statistics.  
Staff.

I.E. 349. Elementary Quality Control  
3-0-3. Prerequisite: Math. 104. Not to be scheduled for credit if credit for I.E. 339 or I.E. 439 has been earned.  
An introduction to industrial quality control by statistical methods. This course will include methods of data analysis, sampling, and control charts as applied to manufacturing processes.  
Text: E. L. Grant, Statistical Quality Control.  
Staff.

I.E. 402. Production Problems  
3-0-3. Prerequisite: Senior standing, I.E. 304 or instructor permission.  
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: To be selected.  
Staff.

I.E. 410. Industrial Surveys and Reports  
1-3-2. Prerequisites: Eng. 320 and I.E. 339.  
A study of some of the problems which engineers encounter in investigating and reporting on various industrial operations.  
Text: Staton and Groseclose, Industrial Reports.  
Mr. Staton and Staff.

I.E. 411-412. Seminar  
1-0-1. Prerequisite: Senior standing in I.E.  
To provide an hour for the Industrial Engineering students and faculty to join in discussions on current problems, professional responsibilities and opportunities.  
Text: None.  
Staff.

I.E. 415. Methods and Systems Analysis  
3-6-5. Prerequisites: I.E. 339 or Math. 416 or equivalent.  
A study of methods engineering, work measurement, and systems design. This course provides an understanding of the principles of effective work and of the scientific method as applied to the analysis, measurement, and design of integrated systems of men, materials, and facilities. Applications of theory and principles are made by use of a term project.  
Mr. Smalley and Mr. C. Johnson.

I.E. 416. Motion and Time Study  
2-3-3. Prerequisites: Junior standing; Non-Industrial Engineering students.  
An introduction to the problems of work measurement and work productivity associated with increasing productivity and decreasing the costs of producing goods and services.  
Text: Barnes, Motion and Time Study.  
Staff.

I.E. 420. Cost and Production Estimating  
3-0-3. Prerequisites: I.E. 415.  
A course in the development of estimating technique for tool and equipment costs, production rates, costs ratios, establishment of basic time charts, etc.
I.E. 422. Job Evaluation and Wage Incentives
3-0-3. Prerequisite. I.E. 415 or I.E. 416.
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.
Text: Brennan, *Wage Administration*.

Mr. Smalley and Staff.

I.E. 424. Materials Handling Equipment and Methods
The engineering and design aspects of materials handling equipment, methods of application, operations analysis and systems, including cost controls.

Mr. Eaton and Mr. Apple.

I.E. 425. Engineering Economy
3-0-3. Prerequisites: Math. 104 and Junior Standing.
The fundamental principles and basic techniques of economic analysis of engineering projects. Topics such as time value of money, economic measures of effectiveness, costs and their estimation, basic comparative models, breakeven analysis, and replacement analysis are included.
Text: Grant and Ireson, *Engineering Economy*.

Mr. Groseclose and Staff.

I.E. 433. Electronic Data Processing
3-0-3. Prerequisites: Senior standing and I.E. 415 or I.E. 416.
Case studies of industrial applications of electronic data processing such as inventory control, production control, payroll, etc. Emphasis will be placed on systems analysis, flow charts, and methods and equipment used. Students will be given an opportunity to use electronic data processing equipment in operation at the Rich Electronic Computer Center.
Text: To be selected.

Mr. Krol.

I.E. 434. Introduction to Operations Research
3-0-3. Prerequisites: I.E. 339 and Math. 407 or Math. 238 or equivalents, and Senior Standing.
An introduction to the methodology of Operations Research in the solution of industrial, engineering, and other problems. Emphasis is placed on the development and use of mathematical decision models.

Staff.

I.E. 439. Quality Control
3-0-3. Prerequisites: I.E. 339 or Math. 206 or Math. 416.
The theory and application of statistical control charts to the problems associated with the design, specifications and control of product quality. Also covered is the theory and application of attribute and variables sampling procedures and the problems, associated with the reliability of complex equipment.
Text: Duncan, *Quality Control and Industrial Statistics*.

Staff.

I.E. 441. Sales Engineering
3-0-3. Prerequisite: Senior standing in engineering.
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*.

Mr. Cox.

I.E. 447. Factory and Process Design
2-6-4. Prerequisites: I.E. 420 and I.E. 424 or Instructor permission.
The design, equipment selection and layout studies necessary for new or redesigned manufacturing plants or processes.
### Graduate Courses Offered

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>I.E. 601</td>
<td>Modern Industrial Organizations</td>
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<td>I.E. 603</td>
<td>Methods of Industrial Engineering Research</td>
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<td>I.E. 606</td>
<td>Materials Control</td>
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<td>I.E. 611</td>
<td>Industrial Engineering</td>
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<td>I.E. 613</td>
<td>The Design of Manufacturing Enterprises</td>
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<td>I.E. 615</td>
<td>Transportation Cost Analysis</td>
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<td>I.E. 619</td>
<td>Quality Control</td>
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<td>I.E. 624</td>
<td>Advanced Materials Handling</td>
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<td>I.E. 625</td>
<td>Advanced Engineering Economy</td>
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<td>I.E. 629</td>
<td>Reliability Theory and Practice</td>
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<td>I.E. 640</td>
<td>Advanced Work Measurement</td>
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<td>I.E. 641</td>
<td>Work Center Design</td>
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<tr>
<td>I.E. 642</td>
<td>Work Systems Design</td>
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<td>I.E. 643</td>
<td>Job Evaluation and Incentives</td>
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<td>I.E. 649</td>
<td>Design of Industrial Experiments</td>
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<td>I.E. 655</td>
<td>Econometric Models in Engineering Economy</td>
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<td>I.E. 704, 5, 6</td>
<td>Special Problems in Industrial Engineering</td>
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<td>I.E. 709</td>
<td>Evaluation of Design for Function &amp; Use</td>
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<td>I.E. 710</td>
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<td>I.E. 734</td>
<td>Operations Research I</td>
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<td>I.E. 735</td>
<td>Operations Research II</td>
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<td>I.E. 736</td>
<td>Operations Research III</td>
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<td>I.E. 745</td>
<td>Use of Computers in Industrial Engineering</td>
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<td>I.E. 749</td>
<td>Advanced Industrial Statistics I</td>
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<td>I.E. 750</td>
<td>Advanced Industrial Statistics II</td>
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<td>I.E. 751</td>
<td>Advanced Industrial Statistics III</td>
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<tr>
<td>I.E. 800</td>
<td>Doctor’s Thesis</td>
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</tbody>
</table>
Program in Safety Engineering

Smaller industrial enterprises with limited staff functions will seldom have the services of safety engineering specialists. Even in larger companies where such specialists are present, sound organizational procedure dictates that practically every segment of the organization participate in the safety program. Increasing emphasis is being directed to this participation as accident costs mount and the nature of accident causes is more fully recognized.

Thus, our graduate can expect to be required to deal with problems of accident prevention regardless of his specialty or his work assignment at any particular moment. The following courses are designed to enable one to accept such responsibilities effectively.

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. 403. Elements of Safety Engineering
3-0-3. Prerequisites: I.E. 304, I.E. 339 or equivalent, I.E. 415 or I.E. 416 (Engineering students only).
The nature and extent of the industrial accident problem with particular emphasis on the role of the engineer in modern industrial operations. The identification and solution of technical accident problems using appropriate analysis procedures. Design principles and characteristics for accident prevention in the plant, the process, and the work-center. Not to be scheduled for credit if credit for S.E. 401 or S.E. 404 has been earned.

Text: To be selected.

Mr. Cox and Staff.

S.E. 404. Industrial Safety Administration
3-0-3. Prerequisite: Senior Standing.
The economics of the industrial fire risk. Design of the plant, process, and work-center for optimum fire hazard. Design of fire protection facilities under varying industrial conditions. Credit is not given for both S.E. 405 and S.E. 402.

Text: To be selected.

Mr. Cox and Staff.

Graduate Courses Offered

S.E. 612, 13 Industrial Safety Engineering
S.E. 614 The Design of the Industrial Safety Program
S.E. 615 Industrial Fire Control
S.E. 616 Safety Standards in Industry
S.E. 618 Engineering Control of Industrial Health Hazards
S.E. 619, 20 Method Analysis for Safety
S.E. 621, 22 Design of Machinery Safeguards
S.E. 704, 5, 6 Problems in Safety Engineering
School of Industrial Management
(Established in 1935)


General Information

The principal objective of the School of Industrial Management is to provide collegiate education of the highest possible quality to prepare students for careers as industrial managers. The continuing growth of industry in Georgia, the South and the nation, and the increasing complexity of modern industrial operations have resulted in a great need for college graduates with formal preparation in industrial management. Georgia Tech's industrial management program concentrates on long-range career objectives, rather than attempting to develop specific job knowledge. The emphasis in the program, therefore, is upon developing the student's abilities to utilize the tools of analysis commonly required of industrial managers, to become aware and responsive to his changing environment, and to both develop and implement his ideas.

Undergraduate program. Georgia Tech's School of Industrial Management has a single undergraduate degree program leading to the degree Bachelor of Science in Industrial Management. A student is not permitted a narrow field of specialization or major concentration, as is typical in schools of business.

In the first two years of the program, much of the required work is taken in other departments, including mathematics through introductory calculus and finite mathematics; two full years of laboratory science, chemistry or biology, and physics; and at least a full year of technical electives. In addition, the industrial management student acquires a sound background in the social and behavioral sciences, and the humanities.

Within the School, beginning in the sophomore year, the student is expected to complete an integrated core of courses in the following areas: (1) organization and administration, including principles of management, human relations and organization theory; (2) economic management and analysis; (3) industrial relations, production, marketing and financial management; and (4) legal, political and social environment of industry. Required courses in statistics, managerial accounting and managerial applications of data processing are also included in the program.

Transfers to Industrial Management. Many students who enter Georgia Tech intending to major in one of the engineering or scientific areas become interested in transferring to the School of Industrial Management. Only students who demonstrate their ability to successfully complete the requirements of the program are permitted to transfer. It is therefore definitely to the student's advantage to determine the requirements which must be met before transfer.
will be permitted, as early as possible, in consultation with the Associate Director of the School of Industrial Management.

Graduate Program. A brief description of the Master of Science in Industrial Management program appears on pages 131-132, together with a list of graduate courses offered by the School. A more comprehensive description of the program and course offerings appears in the Graduate Catalogue. Inquiries about the graduate program in industrial management should be addressed to the Director of the School of Industrial Management. Students at Georgia Tech who are contemplating enrolling in the master's program upon completion of an undergraduate program in one of the scientific or engineering curricula are encouraged to consult the School of Industrial Management early in their undergraduate program.

Survey Courses for Non-Majors. In addition to courses offered primarily for its own undergraduate and graduate programs, the School of Industrial Management offers several courses designed expressly for non-majors, as follows:

<table>
<thead>
<tr>
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<tr>
<td>I.M. 204</td>
<td>Survey of Principles of Economics</td>
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<td>I.M. 316</td>
<td>Finance Survey for Engineers</td>
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<td>I.M. 317</td>
<td>Industrial Marketing</td>
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<td>I.M. 329</td>
<td>Survey in Business Law</td>
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<td>I.M. 336</td>
<td>Accounting Survey</td>
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Freshman Year

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<td>Inorganic Chemistry OR</td>
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<td>Biol. 201-2-4</td>
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<td>Eng. 101-2-5*</td>
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Totals 18-8-18 17-8-18 17-14-20

*Students are required to earn a minimum grade of “C” in both English 101 and 102.
**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.
***For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
### Sophomore Year

<table>
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<tr>
<th>Course No.</th>
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<td>Eng. 201-2-3</td>
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<td>Phys. 211-12-13</td>
<td>Mechanics, Electricity, Heat, Light and Sound</td>
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<td>I.M. 320*</td>
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<td>Psy. 303</td>
<td>Introductory Psychology</td>
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*Totals 19-5-19 19-5-19 19-5-19

*To receive credit towards the degree B.S. in I.M., a minimum grade of "C" must be earned in each of these courses, viz., I.M. 201, 202, 203, 215, 216, 220, 320.

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

### Junior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
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<td>I.E. 416</td>
<td>Motion and Time Study</td>
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*Must come from S.S. 208, 301, 307, 331, 332, 334, 412.

### Senior Year*

<table>
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<th>Course No.</th>
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*Totals 18-0-18 18-0-18 18-0-18

*A minimum grade average of "C" must be earned during the student’s last three full-time quarters to qualify for graduation.

**Technical courses as approved by the School of Industrial Management.

***Not more than 9 credit hours of Advanced ROTC may be used for elective credit.
Courses of Instruction

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

I.M. 201, 202, 203. Economic Principles and Problems
3-0-3. Prerequisite: Sophomore standing or permission of instructor.

This three-course sequence begins with an analysis of the industrial growth of the American economy. It continues with a study of the scope and method of economics, the theory of the firm, and the theory of markets and distribution. It concludes with an examination of national income theory and international trade.

Text: G. L. Bach, Economics.
Mr. Biven and Staff.

I.M. 204. Survey of Principles of Economics
3-0-3. Prerequisites: Sophomore standing. Not open to I.M. students.

This is a survey course; an introduction to economics. It includes an examination of the two major areas of economics: national income and employment theory, and the theory of markets, distribution, and the behavior of the firm.

Text: Melville J. Ulmer, Economics.
Mr. Biven and Staff.

I.M. 215, 216. Accounting I, II
3-0-3. Prerequisite: Sophomore standing.

This is a two-quarter sequence course in the fundamentals of accounting. During the first quarter fundamental accounting concepts are introduced and their use in business decisions discussed. During the second quarter attention is given to various types of business organizations and the parallel effects on operations, taxes, and accounting procedures. These courses together are designed to emphasize the "tool aspect" of accounting for management. Applications of accounting information to management decisions are stressed throughout the two-quarter sequence.

Text: Milroy and Walden, Accounting Theory and Practice-Introductory.
Mr. Bollinger and Staff.

I.M. 220. Industrial Organization
3-0-3. Prerequisite: Sophomore standing.

Presents a fundamental understanding of the process, objectives and functional areas of business from the managerial viewpoint as well as the dynamic nature of business and the emerging tools and analytical approaches of modern business.

Text: Weimer, Business Administration.
Mr. O'Connor and Staff.

I.M. 310, 311. Marketing I, II
3-0-3. Prerequisite: I.M. 203 or equivalent.

A critical examination of the activities involved in the movement of manufactured goods from the producer to the consumer. Basic functions of marketing and the institutions available for their performance are studied. Emphasis is placed on principles, policies, and trends relating to marketing efficiency.

Texts: E. J. McCarthy, Basic Marketing; Buskirk, Cases and Readings in Marketing.
Mr. Flinn and Staff.

I.M. 312. Distribution Management
3-0-3. Prerequisites: I.M. 310, 311.

An analysis is made of the functions and problems of the sales manager, particularly with reference to the characteristics of the sales organization and the selection, training, supervision and control of the personal selling force.

Text: To be selected.
Mr. Brewster, Mr. Flinn.

I.M. 316. Finance Survey for Engineers
3-0-3. Prerequisite: Junior standing. Not open to I.M. students.
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. Credit not given for both I.M. 316 and I.M. 338.

Text: Bonneville, Dewey and Kelly, Organizing and Financing Business.
Mr. Cooper and Staff.

I.M. 317. Industrial Marketing
3-0-3. Prerequisite: Junior standing. Not open to I.M. undergraduates.
A survey of marketing principles and policies, with emphasis on the functions that must be performed by manufacturers and supplementary marketing institutions to insure profitable and effective production of manufactured goods. Credit not given for both I.M. 317 and I.M. 310.
Text: Taylor and Shaw, Marketing.
Mr. Brewster, Mr. Flinn.

I.M. 320. Industrial Management Principles
3-0-3. Prerequisite: I.M. 220.
This course is designed to acquaint the undergraduate Industrial Management student with fundamental principles of management, and to give him a framework within which he can analyze the problems of the specialized areas such as marketing management, production management, financial management, and industrial relations. The evolution of a modern theory of management will be discussed and special emphasis will be given to the functions of planning, organizing, motivating, and control.
Text: Heckmann and Huneryager, Human Relations in Management.
Mr. O'Connor and Staff.

I.M. 323, 324. Statistics I, II
3-0-3. Prerequisite: Junior standing.
The first course deals with the collection, analysis and interpretation of quantitative data. Measures of central tendency, types of variation and index numbers are covered in detail.
The second course covers statistical inference, time series analysis and simple correlation as tools of control and forecasting in the fields of economics, business and industry. Text: Griffin, Statistics: Methods and Applications.
Mr. Fulmer and Staff.

I.M. 329. Survey in Business Law
3-0-3. Prerequisite: Junior standing. Not open to I.M. undergraduates.
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.
Mr. Haldi, Mr. Proctor.

I.M. 336. Accounting Survey
3-0-3. Prerequisite: Junior standing. Not open to I.M. undergraduates.
This is a brief survey of the analysis and the recording of business transactions, the preparation of financial statements and their interpretations. Credit not given for both I.M. 336 and I.M. 215.
Text: Childs, Accounting for Management Control.
Mr. Bollinger and Staff.

I.M. 337. Cost Accounting
4-0-4. Prerequisites: I.M. 336 and Junior standing. Not open to I.M. undergraduates.
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. Credit not given for both I.M. 337 and I.M. 345.
Text: Childs, Accounting for Management Control.
Mr. Bollinger and Staff.

I.M. 338, 339. Finance I, II
3-0-3. Prerequisites: I.M. 203, 216.
This is a two-quarter study of the principles of corporation finance. It
consists largely of lectures with brief illustrations of the following topics: forms of business organizations and conditions under which each might be used to the best advantage; corporate securities including stocks, bonds, mortgages, and notes; sources of capital and methods of financing; profits, reserves, surplus and dividend policies; expansion; refinancing and reorganization.

Text: Guthmann and Dougall, Corporate Financial Policy.

Mr. Cooper and Staff.

I.M. 343. Taxation
3-0-3. Prerequisite: I.M. 216.
This course deals with federal income taxes and is directed toward the management planning necessitated by various tax alternatives. The tax implications of business management are reviewed. Major emphasis is on the business income tax requirements, though some attention will be given to the personal incidence of income tax. Personal incidence is covered relative to tax applications in the partnership and proprietorship forms of business organization.


Mr. Bollinger

I.M. 345, 346. Cost Analysis and Control, I, II
3-0-3. Prerequisite: I.M. 216.
This is a two-quarter sequence course in cost accounting fundamentals and in the management application of cost data. The first quarter is concerned with the mechanics of cost determinations and the application of such data to budgetary applications. The second quarter includes such topics as: quantitative elements in decision-making, capital expenditure analysis, profit/volume analysis, product pricing. During the two-quarter sequence major emphasis is placed on management use of the cost accounting tool, more than on the mechanics of cost determination.

Text: Shillinglaw, Cost Accounting Analysis and Control.

Mr. Bollinger and Staff.

I.M. 347. Techniques of Industrial Communications
3-0-3. Prerequisite: Junior standing.
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: Cutlip and Center, Effective Public Relations.

Mr. Adler.

I.M. 349. Economics of Industrial Demand
3-0-3. Prerequisite: Junior standing.
This is a course covering the principles, methods and procedures of purchasing goods for industrial use. Emphasis is placed on procurement as a management function.


Mr. Flinn and Staff.

I.M. 390. Survey of Statistics
3-0-3. Prerequisite: Junior standing.
Not open to Industrial Management undergraduates.
A survey of discrete statistics with special emphasis on economic and business applications. Includes sampling, the normal distribution, hypothesis testing, linear regressions and correlation, time series and index numbers.


Mr. Fulmer and Staff.

I.M. 408. Personnel Management Problems
3-0-3. Prerequisite: Junior Standing.
Credit not given for both I.M. 408 and I.M. 318.
This course concentrates on typical problems encountered by the personnel department in an industrial organization, such as selection, training and placement of workers, merit rating and promotion, and the development of sound personnel management techniques.

Text: Pigors and Myers, Personnel Administration.

Mr. Marshall.
I.M. 415. Automation and Management
3-0-3. Prerequisite: Senior standing.
A survey of automatic and electronic processes, together with recent technological changes, and their impact on management standards, personnel displacement, private investment, productivity, and industrial organization.
Mr. Buckingham and Staff.

I.M. 416. Management Applications of Data Processing
3-0-3. Prerequisite: I.M. 345 or 337, Senior standing.
The aim of the course will be to study and show how mechanical and electronic devices are meeting management's need for planning and control data. The first part of the course will consider the principles of data processing; the second part will deal with basic applications to management problems.
Text: Borko, Computer Applications in the Behavioral Sciences.
Staff.

I.M. 418. Production Management I
3-0-3. Prerequisites: I.M. 320, 345, Math. 235.
This course deals with the manufacturing division of an industrial firm. A very careful study of cost theory is made as it applies to creative planning in manufacturing management.
Text: Bowman and Fetter, Analysis for Production Management.
Mr. Han and Staff.

I.M. 419. Production Management II
3-0-3. Prerequisites: I.M. 324, 418.
This course is concerned with control of manufacturing operations through mathematical programming, statistical analysis, and information flow, and it is primarily directed toward the analysis and solution of manufacturing problems.
Text: Bowman and Fetter, Analysis for Production Management.
Mr. Han and Staff.

I.M. 420. Integrated Management Problems
3-0-3. Should be taken during student's last quarter in school.
Comprehensive cases are used to integrate knowledge about the functional areas of industrial management—production, finance, marketing, industrial relations, human relations and administration.
Text: Selected cases.
Mr. Carney and Staff.

I.M. 422. Finance III
3-0-3. Prerequisite: I.M. 339.
Analytical techniques of financial management are developed and then applied to case studies. Among the topics covered are flow of funds analysis, present value techniques, cost of capital, and capital budgeting analysis.
Mr. Cooper and Staff.

I.M. 425, 426. Law I, II
3-0-3. Prerequisite: Senior standing.
The first course includes background of the law and legal procedures; a study of contracts; the problem of organizing a business; forms it may take and procedure of organization; financing the new business; acquiring the site and other problems involving property, both real and personal; agency and labor relations.
The second course deals with legal problems peculiar to particular forms of organization, distribution of goods, negotiable instruments, bailments and common carriers, insurance, taxes and business, competitive practices, patents and copyrights as business property, and bankruptcy.
Text: Dowvotaw, Legal Aspects of Business Administration.
Mr. Proctor and Staff.

I.M. 428, 429. Industrial Relations
3-0-3. Prerequisite: Junior standing.
The first course makes an examination of the trade-union as an economic institution and of issues in management-union relations.
The second course deals with the economics of the labor market, including analysis of labor mobility, unemployment, wage determination, and theories of wages.


Mr. Marshall and Staff.

I.M. 430. Management Decision Laboratory

0-3-1. Prerequisite: Senior standing.

This course gives students practice in making certain management decisions. Use is made of computers and simulated operations of manufacturing firms in a competitive market.


Mr. Fulmer.

I.M. 432. Intermediate Economic Analysis

3-0-3. Prerequisites: I.M. 202 or 204, or permission of instructor.

This course is an advanced course in microeconomics. It deals with the scope and methods of economics, production and distribution theory, and the structure of markets.


Mr. Biven and Staff.

I.M. 443. Principles of Investment

3-0-3. Prerequisite: I.M. 339 or I.M. 316, or permission of the instructor.

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 and Dougal, *Investments.*

Mr. Etheridge.

I.M. 454. Labor Relations Problems

3-0-3. Prerequisite: I.M. 428.

An analysis of public policy in labor relations as reflected in legislative enactments, court decisions, and the common law. Emphasis will be given to management-labor problems arising out of strikes, labor injunctions, picketing, union security, contract negotiation, and other matters as affected by and related to recent laws such as the Norris-LaGuardia Act, Wage-Hour Act, Wagner Act, and Taft-Hartley Act.

Text: To be selected.

Mr. Dallas, Mr. Marshall.

I.M. 455. Marketing III

3-0-3. Prerequisite: I.M. 311.

This course consists of cases involving the management of marketing activities. Careful consideration is given to the functions of planning, organizing, and controlling the essential elements of the overall marketing program of the firm.


Mr. Flinn and Staff.

I.M. 456. Marketing Management Problems

3-0-3. Prerequisite: I.M. 455 or permission of instructor.

This is an advanced problem course in the field of marketing manufactured goods.

Text: To be selected.

Mr. Brewster, Mr. Flinn.

I.M. 458. Contemporary Unionism and Collective Bargaining

3-0-3. Prerequisite: I.M. 428.

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, and analysis of union-management contracts with attention given to typical clauses such as provisions for grievance machinery, technological changes, lay-offs, and union security.


Mr. Dallas, Mr. Marshall.

I.M. 459. Industrial Relations in the Piedmont Region

3-0-3. Prerequisite: Senior standing.
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.


Mr. Gilman.

I.M. 465. Nonmarket Environment of the Firm
3-0-3. Prerequisite: Senior standing.

Analysis of the nature of and significance to management of the legal, social and political framework within which broad economic influences are generated, market transactions are conducted, and the firm is managed.

Text: Instructor's syllabus and selected readings.

Mr. Gilman and Staff.

I.M. 474. Industrial Development in Latin America
3-0-3. Prerequisite: I.M. 203 or I.M. 204; knowledge of Spanish; and consent of the instructor.

A course designed to acquaint the student with the latest theories and principles of industrial development in developing countries. The student will prepare an analysis of the problems and opportunities in industrial development in a specific Latin American country.


Mr. O'Connor.

I.M. 486. National Income and Fiscal Policy
3-0-3. Prerequisite: Senior standing.

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.


Mr. Biven, Mr. Han.

I.M. 487. Comparative Economic Systems
3-0-3. Prerequisite: I.M. 203 or equivalent.

A critical study is made of the methods by which various economic systems meet common fundamental problems in production, exchange, distribution, consumption, and capital formation. Comparative analyses of the major theories underlying these methods are undertaken, and their efficacy considered in the light of modern technology.


Mr. Buckingham and Staff.

I.M. 488. Economics of Industrial Competition
3-0-3. Prerequisite: Senior standing.

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.


Staff.

I.M. 490. Contemporary Economic Theory
3-0-3. Prerequisite: I.M. 203 or equivalent.

This is a course in national economic policy. An analysis will be made of such problems as full employment, inflation, the relation of government to business, the farm situation, international trade conditions and the underdeveloped countries.

Text: To be selected.

Staff.

I.M. 491. Seminar
1-0-1. Prerequisite: Senior standing.

Prominent representatives of industry discuss with students signifi-
significant developments in Industrial Management.

Text: None. Staff.

I.M. 495. Economics of Industrial Location
3-0-3. Prerequisite: I.M. 203 and I.M. 311 or equivalent.

A survey of economic factors influencing industrial location. General consideration will be given to locational patterns, processes of economic growth, and the public policy aspects of managerial decisions. More particular attention will be directed to the impact of transfer and processing costs, land use competition and technological change on problems of plant location.

Text: Selected readings. Mr. Dallas.

I.M. 499. Industrial Management Honors Seminar
3-0-3. Prerequisite: Last or next to last quarter seniors by invitation of the Faculty of the School of Industrial Management.

This course is designed to give a selected group of outstanding seniors in the School of Industrial Management an opportunity to research, analyze and discuss current management and economic problems with specialists in the various areas.

Text: Selected readings. Senior Staff.

Graduate Courses Offered

The School of Industrial Management offers a program of study leading to the degree of Master of Science in Industrial Management. The School welcomes applications. There is no rigid requirement of a particular background. Graduates in engineering, the physical sciences, the liberal arts, business administration and industrial management are encouraged to apply if their undergraduate preparation has included at least one year of college mathematics, the equivalent of 20 quarter hours of an experimental science at the college level, and college level courses in economics, statistics, finance, marketing, labor relations, management organization and principles, accounting, and cost accounting. Deficiencies in preparation may be removed by study in the Georgia Tech undergraduate programs. In selecting its students, the School attempts to evaluate each man's potential for growth in his future field of endeavor.

The Master's program gives its students a firm grasp of management fundamentals and techniques together with a breadth of view which fully prepares the students for general management responsibility.

I.M. 618 The Law of Market........................................ 3-0-3
I.M. 620 The Theory of Industrial Organization.................. 3-0-3
I.M. 622 Development of Management Thought.................. 3-0-3
I.M. 624 Economics of Production.................................. 3-0-3
I.M. 626 Development of Economic Thought............... 3-0-3
I.M. 630 Production Management.................................. 3-0-3
I.M. 632 Manufacturing Management Problems.................. 3-0-3
I.M. 635 Managerial Accounting.................................. 3-0-3
I.M. 636 Problems in Accounting Control.................. 3-0-3
I.M. 649 Financial Management I.................................. 3-0-3
I.M. 650 Financial Management II................................. 3-0-3
I.M. 653 Industry and Government.................................. 3-0-3
I.M. 654 Personnel Administration................................. 3-0-3
I.M. 656 Administrative Practices in Human Relations.. 3-0-3
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<tr>
<td>I.M. 658</td>
<td>Cases in Marketing Management</td>
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<tr>
<td>I.M. 659</td>
<td>Marketing Research and Analysis</td>
<td>3-0-3</td>
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<tr>
<td>I.M. 660</td>
<td>Economic Forecasting</td>
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<td>I.M. 667</td>
<td>Labor Problems</td>
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<td>I.M. 671</td>
<td>Labor and the Economy</td>
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<tr>
<td>I.M. 673</td>
<td>Macroeconomic Analysis</td>
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<td>I.M. 674</td>
<td>Application of Statistical Methods to Management Decision-Making</td>
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<td>I.M. 680</td>
<td>Executive Development and Motivation</td>
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<td>Master's Thesis</td>
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<td>I.M. 701, 2, 3</td>
<td>Seminar</td>
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<td>I.M. 704, 5, 6</td>
<td>Industrial Management Research</td>
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School of Mathematics
(Established in 1952)


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 provide more advanced mathematical training for those who plan to make mathematics their profession.

In addition to the usual undergraduate service courses, programs of study are offered which lead to the degrees of

Bachelor of Science in Applied Mathematics
and
Master of Science in Applied Mathematics.

These programs are open to both men and women.

Numerous advanced undergraduate and graduate courses are offered which may be used as electives by students in the schools of engineering and the natural sciences. Close cooperation is maintained with the staff of the Rich Electronic Computer Center, which is located on the campus.

Students of especial ability are invited to participate in an Honors Program which extends through a large part of the freshman and sophomore years.

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.

*Deceased October 31, 1962.
**Deceased November 26, 1962.
### Freshman Year

<table>
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<th>Subject</th>
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<td>Introduction to Literature</td>
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**Totals**: 18-14-20 17-8-18 17-8-18

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

*Either Modern Language or Social Science is acceptable.

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

### Sophomore Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
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<td>Survey of the Humanities</td>
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<tr>
<td>Math. 202-3</td>
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<td>Math. 238</td>
<td>Finite Mathematics II</td>
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<td>Math. 305-6</td>
<td>Differential Equations</td>
<td>3-0-3</td>
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<tr>
<td>Phys. 207-8-9</td>
<td>Physics</td>
<td>5-3-6</td>
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**Totals**: 19-8-20 19-8-20 14-8-18

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

### Junior Year

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<td>Eng. 315</td>
<td>Public Speaking</td>
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<tr>
<td>Math. 309</td>
<td>Intro. to Higher Algebra</td>
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<tr>
<td>Math. 401-2-3</td>
<td>Intro. to Analysis</td>
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<tr>
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<td>Phys. 308</td>
<td>Intermediate Electricity</td>
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<tr>
<td>Phys. 319</td>
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**Totals**: 9-0-18 12-0-18 9-0-18

*For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.*
### Senior Year

<table>
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<th>3rd Q.</th>
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<td>Introd. to Analysis</td>
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<td>Math. 427-8-9</td>
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<td>8-0-17</td>
<td>10-0-19</td>
<td>8-0-17</td>
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**NOTE 1:** The total of 54 hours of electives in the sophomore, junior, and senior years must include at least 9 hours of humanistic-social studies from the list on page 34 and at least 12 additional hours of course work in fields other than mathematics and advanced ROTC. The total of 54 hours must not include more than 9 hours of advanced ROTC.

### Courses of Instruction

**Math. 100. College Algebra and Trigonometry**
5-0-5. Prerequisite: Entrance algebra and trigonometry.

Real and complex numbers; the function concept; exponential, logarithmic, and trigonometric functions; theory of equations, including trigonometric equations; permutations, combinations; sequences, mathematical induction.


**Math. 101. College Algebra**
5-0-5. Prerequisite: Entrance algebra.

The real number system, the concept of function, theory of equations, systems of equations, permutations, combinations, the binomial theorem, sequences, mathematical induction, progressions.


**Math. 102. Trigonometry**
5-0-5. Prerequisite: Math. 101.

Exponential and logarithmic functions, trigonometric functions, complex numbers, inverse functions, trigonometric equations.


**Math. 104. Analytic Geometry and Calculus**
5-0-5. Prerequisite: Math. 100 or 102.

Elements of analytic geometry, including the conic sections. Introductory calculus with emphasis on the concepts of limit, continuity, and derivative. Differentiation of algebraic and trigonometric functions, simple applications.


**Math. 201. Calculus**
5-0-5. Prerequisite: Math. 104.

The antiderivative and the definite integral. Area, volume, work. Differentiation and integration of transcendental functions. Techniques of integration.


**Math. 202. Calculus**
5-0-5. Prerequisite: Math. 201.

Polar coordinates, vectors, solid analytic geometry, linear systems and matrices.


**Math. 203. Calculus**

Partial differentiation, multiple integrals, improper integrals, sequences, infinite series.

**Math. 205. Elementary Statistical Analysis**

3-0-3. Prerequisite: Math. 104.

An introduction to the theory of probability for finite sample spaces. Basic notions of sampling theory; averages and measures of variability. The normal distribution.


**Math. 206. Elementary Statistical Analysis**

3-0-3. Prerequisite: Math. 205.


**Math. 235. Finite Mathematics I**

3-0-3. Prerequisite: Math. 104.


**Math. 238. Finite Mathematics II**

3-0-3. Prerequisite: Math. 201.

A course similar to Math. 235 but somewhat more advanced. Elementary mathematical logic, set theory, elements of linear algebra, convex sets and linear programming. Credit will not be allowed for both Math. 235 and Math. 238.


**Math. 304. Differential Equations**

5-0-5. Prerequisite: Math. 203.


**Math. 305. Differential Equations**

3-0-3. Prerequisite: Math. 203 or concurrently.

A course centered around the linear equation with applications selected from physics, chemistry, and mechanics.


**Math. 306. Differential Equations**

3-0-3. Prerequisite: Math. 305.

Systems of linear differential equations, linear differential equations with variable coefficients, power-series solutions, the method of Frobenius.


**Math. 309. Introduction to Higher Algebra**

3-0-3. Prerequisites: Math. 203.

Vectors, vector spaces, matrices, systems of linear equations, transformations of coordinates in a vector space, quadratic forms, diagonalization, characteristic values.


**Math. 400. Special Topics**

3-0-3. For example Math. 400 (a) could be Optimization Techniques, a companion course to Math. 407.

The purpose here is to enable the School of Mathematics to comply with requests for courses in selected topics. Given on demand.

Text: To be selected.
Math. 401. Introduction to Analysis
3-0-3. Prerequisite: Math. 304 or 305 or concurrently.
The first of four courses on fundamental concepts of analysis. Real and complex number systems, sets, limits, continuity, differentiation of functions of one real variable.
Staff.

Math. 402. Introduction to Analysis
3-0-3. Prerequisite: Math. 401.
A continuation of Math. 401. Partial differentiation, functions of bounded variation, rectifiability, connectedness, the Riemann-Stieltjes integral.
Staff.

Math. 403. Introduction to Analysis
3-0-3. Prerequisite: Math. 402.
Infinite series, sequences of functions, improper integrals.
Staff.

Math. 404. Introduction to Analysis
3-0-3. Prerequisite: Math. 402.
The fourth course of the sequence on fundamental concepts, Jacobians, implicit function theorem, line integrals, multiple integrals, vector analysis.
Staff.

Math. 405. Modern Algebra
3-0-3. Prerequisite: Math. 309.
A survey of modern algebraic systems including groups, rings, fields, and finite-dimensional vector spaces. Linear transformations on vector spaces with matrix interpretation.
Text: Halmos, *Finite-Dimensional Vector Spaces*.
Staff.

Math. 407. Linear Programming
3-0-3. Prerequisite: Math. 201 or concurrently.
Mathematical structure of the linear programming problem. Requisite topics in linear algebra. Simplex method. Transportation and production scheduling, inventory control, and other applications.
Text: Hadley, *Linear Programming*.
Staff.

Math. 409. Fundamental Concepts in Mathematics
3-0-3. Prerequisite: Differential equations or consent of instructor.
A course designed for mathematics majors and beginning graduate students. Unifies and extends certain basic notions of college mathematics.
Text: To be selected.
Staff.

Math. 411. Advanced Engineering Mathematics
3-0-3. Prerequisite: Math. 304 or 305.
The Laplace transformation and its properties. Elementary applications to physical systems involving the solution of ordinary and partial differential equations.
Staff.

Math. 412. Advanced Engineering Mathematics
3-0-3. Prerequisite: Math. 304 or 306 or consent of instructor.
Fourier series, Bessel functions, partial differential equations.
Staff.

Math. 413. Advanced Engineering Mathematics
3-0-3. Prerequisite: Math. 304 or 305 or consent of instructor.
Topics from complex function theory including conformal mapping and contour integration.
Text: Churchill, *Complex Variables and Applications*.
Staff.

Math. 414 Modern Algebra
3-0-3. Prerequisite: Math. 405.
A continuation of Math. 405. Inner products, Gram-Schmidt process, Schwarz’s inequality and the spectral theorem.

**Math. 415. Introduction to Probability**  
3-0-3. Prerequisite: Math. 203 or concurrently.  
An introduction to probability theory and its applications; discrete and non-discrete probability distributions; laws of large numbers.  

**Math. 416. Mathematical Statistics**  
3-0-3. Prerequisite: Math. 415.  
A general study of discrete, continuous, and limiting distributions with emphasis on the normal distribution and the central limit theorem; exact sampling distributions, selected topics in estimation and testing hypotheses.  

**Math. 417. Mathematical Statistics**  
3-0-3. Prerequisite: Math. 416.  
A continuation (from Math. 416) of estimation and of testing hypotheses; regression theory, design of experiments, analysis of variance, distribution-free methods.  

**Math. 418. Probability with Applications**  
3-0-3. Prerequisite: Math. 203.  
An introduction to random processes with the necessary preliminary study of discrete sample spaces, combinatorial analysis, and basic laws of probability.  

**Math. 419. Probability with Applications**  
3-0-3. Prerequisites: Math. 418; Math. 309 or concurrently.  

**Math. 420. Vector Analysis**  
3-0-3. Prerequisite: Math. 304 or 306 or consent of instructor.  
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.  

3-0-3. Prerequisite: Math. 203.  
Organization and characteristics of digital computers, number systems; Boolean algebra; programming and coding of elementary problems.  
Text: To be selected.  Staff.

**Math. 426. Computer Programming and Coding**  
3-0-3. Prerequisite: Math. 425, 443.  
The preparation of problems for high-speed digital computers with particular reference to the machines currently available at the Rich Electronic Computer Center.  
Text: To be selected.  Staff.

**Math. 427. Seminar**  
2-0-2. Prerequisites: Math. 309, 402, and either 306 or 304.  
Study and discussion intended to enhance investigative independence and expository skill. Content varying from year to year, usually beginning with solution of a series of related problems.  
Text: None.  Staff.

**Math. 428. Seminar**  
2-0-2. Prerequisite: Math. 427.  
A continuation of Math. 427 with greater emphasis on individual study. Oral and written presentation of results.  
Text: None.  Staff.
Math 429. Seminar
2-0-2. Prerequisite: Math. 428.

Individual investigations of problems of moderate difficulty with a suitable account of results.
Text: None. Staff.

3-0-3. Prerequisite: Math. 203.

An elementary tensorial treatment of various geometric and mechanical concepts needed in the study of hydrodynamics, elasticity, and plasticity.

Math. 431. Introductory Topology
3-0-3. Prerequisite: Math. 401 or consent of instructor.

A course to provide background for the use of topological methods in analysis. Topological spaces, continuous transformations, metric spaces.
Text: Hocking and Young, *Topology*. Staff.

Math. 434. Differential Geometry
3-0-3. Prerequisite: Math. 203.

The theory of curves and surfaces, including the first and second fundamental forms of a surface and topics related to them.
Text: To be selected. Staff.

Math. 441. Theory of Groups
3-0-3. Prerequisite: Math. 203.

An introductory course in group theory suitable for students of mathematics, chemistry, and physics.
Text: To be selected. Staff.

Math. 443. Numerical Analysis I
3-0-3. Prerequisite: Math. 203.

Numerical solutions of systems of linear and nonlinear equations; interpolation and "best" approximations in the least square and uniform norms.
Text: To be selected. Staff.

Math. 444. Numerical Analysis II
3-0-3. Prerequisites: Math. 304 or 306; Math. 443 or consent of instructor.

Numerical integration, operator calculus, difference equations, and numerical approximation of solutions of ordinary differential equations.
Text: To be selected. Staff.

Math. 445. Numerical Analysis III
3-0-3. Prerequisite: Math. 444 or consent of instructor.

Numerical approximation of solutions of integral equations and partial differential equations; eigenvalue problems; selected topics of current interest.
Text: To be selected. Staff.

Math. 446. Introduction to Game Theory
3-0-3. Prerequisites: Math. 235 or Math. 309 or Math. 407 or consent of instructor.

An introduction to game theory with emphasis on zero-sum two-person games. Military, economic, and recreational illustrations. Discussion of connections with linear programming and decision functions.
Text: To be selected. Staff.

Math. 491. Topics from Advanced Calculus
3-0-3. Prerequisite: Math. 203.

A course designed to furnish a broader foundation in analysis for students in the engineering curricula. Jacobians and the implicit function theorems, Riemann-Stieltjes integral, uniform continuity, theorems of Green, Stokes, and Gauss, uniform convergence of infinite series and improper integrals.
Graduate Courses Offered

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Math. 600</td>
<td>Special Topics</td>
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<tr>
<td>Math. 601, 2, 3</td>
<td>Methods of Applied Mathematics</td>
<td>3-0-3</td>
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<td>Math. 604, 5, 6</td>
<td>Modern Abstract Algebra I, II, III</td>
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<td>Math. 607, 8, 9</td>
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<td>Math. 618, 19, 20</td>
<td>Mathematical Theory of Elasticity</td>
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<td>Math. 634, 5, 6</td>
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<td>Math. 644, 5, 6</td>
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<td>Math. 694</td>
<td>Special Functions of Higher Mathematics</td>
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<td>Math. 695</td>
<td>Laplace Transforms</td>
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<td>Math. 696</td>
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<td>Math. 707, 8, 9</td>
<td>Advanced Problems in Ordinary</td>
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For requirements for the master's degree in Applied Mathematics, consult the Graduate Bulletin.


School of Mechanical Engineering
(Established in 1888)


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 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, heat transfer 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.

*Leave of Absence
### Freshman Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<tbody>
<tr>
<td>Chem. 101-2-3</td>
<td>Inorganic Chemistry</td>
<td>3-3-4</td>
<td>3-3-4</td>
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<tr>
<td>Draw. 113-14-15</td>
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<td>0-6-2</td>
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<tr>
<td>Eng. 101-2</td>
<td>Composition and Rhetoric</td>
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<td>Eng. 105</td>
<td>Introduction to Literature</td>
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<td>Calculus</td>
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<td>5-0-5</td>
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<td>M.L. *</td>
<td>Modern Language OR</td>
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<tr>
<td>S.S. 111-12-13</td>
<td>Social Science</td>
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<td>3-0-3</td>
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<td>Orientation</td>
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<td>18-14-20</td>
<td>17-14-20</td>
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</tr>
</tbody>
</table>

*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.

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

### Sophomore Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
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<th>3rd Q.</th>
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<tbody>
<tr>
<td>Eng. 201-2</td>
<td>Survey of Humanities</td>
<td>3-0-3</td>
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<td>Math. 202-3</td>
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<td>Math. 304</td>
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<td>Engineering Materials and Processes</td>
<td>2-3-3</td>
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*For course numbers, see the course descriptions under appropriate ROTC sections of this Bulletin.
## Junior Year

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<td>E.E.</td>
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*Totals* 15-6-17 17-6-19 16-9-19

*The Basic Science Elective will be selected from Chemistry, Mathematics or Physics. The Mathematics or Physics course must be numbered 300, or above.

**Humanities elective to be selected from list on page 34.

## Senior Year

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<th>Course</th>
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*Totals* 17-9-20 16-6-18 15-6-17

*M.E. Electives are to be chosen from the following engineering analysis, design and systems courses: M.E. 420, 421, 422, 423, 428, 431, 432, 439, 443 and at least two of them shall be selected from M.E. 420, 421, and 422.

**Group Elective courses are chosen in the field of Mechanical Engineering, they will be selected from the following: M.E. 406, 420, 421, 422, 425, 426, 427, 428, 429, 431, 432, 439, 443, 445, 447, and 450.

Three courses in science or technical courses in another field of engineering may be selected to fulfill the Group Elective requirement. A student who wishes to do this 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. 207. Engineering Materials and Processes
2-3-3. Prerequisites: Chem. 103 and Phys. 207 or concurrently.

The atomic, unit cell and microscopic principles of metal structures are introduced. The technology of casting, forming and joining is also studied. Laboratory problems and metallographic investigations complete the work.

Text: Burton, Applied Metallurgy for Engineers.
Mr. Vidosic and Staff.

M.E. 208. Engineering Materials and Processes

Machine tools are analyzed. The theory and metallurgy of cutting are studied. Tool geometry, cutting fluids technology, thermal problems and surface finish are considered. Experiments include machinability, cutting dynamometry and metrology problems.

Mr. Vidosic and Staff.

M.E. 309. Metallurgy and Heat Treatment
2-3-3. Prerequisite: M.E. 207.

An expanded study of the elements of material science. Principles of physical metallurgy, metallography and strengthening mechanisms are studied and some experiments are performed.

Text: Guy, Elements of Physical Metallurgy.
Mr. Vidosic and Staff.

M.E. 310. Fluid Mechanics
3-0-3. Prerequisites: M.E. 323 or parallel.

An introduction to the study of fluid mechanics is presented, including the following topics: statics, kinematics, dynamics, energy and momentum relations for steady flow.

Text: Streeter, Fluid Mechanics.
Mr. Purdy and Staff.

M.E. 311. Fluid Mechanics
3-3-4. Prerequisites: M.E. 324 or parallel, Mech. 303 or parallel, M.E. 310 and M.E. 350.

A continuation of M.E. 310 with a presentation of the following topics: dimensional analysis and similarity, incompressible flow in closed conduits, compressibility phenomena, and drag forces.

Text: Streeter, Fluid Mechanics.
Mr. Purdy and Staff.

M.E. 315. Heat Transfer
3-0-3. Prerequisites: M.E. 323 and Math. 304 or 305.

Basic heat transfer mechanisms are introduced. Radiation, steady and unsteady conduction, and demonstrations of the pertinent principles are emphasized.

Text: To be selected.
Mr. Sunderland and Staff.

M.E. 320. Thermodynamics
4-0-4. Prerequisites: Phys. 209 or parallel, Math. 203 or parallel.

The fundamentals of engineering thermodynamics are covered. The properties of fluids, energy equations, and practical applications are included.

Text: Jones and Hawkins, Engineering Thermodynamics.
Mr. Hinton and Staff.

M.E. 322. Thermodynamics
3-0-3. Prerequisites: Phys. 209 or parallel; Math. 203 or parallel.

A study of the fundamental laws of engineering thermodynamics and the properties of systems. Processes in the perfect gas are considered.

Text: Jones and Hawkins, Engineering Thermodynamics; Keenan and Keyes, Thermodynamic Properties of Steam.
Mr. Hinton and Staff.
M.E. 323. Thermodynamics
3-0-3. Prerequisites: M.E. 322, Phys. 209, Math. 203.
A continuation of M.E. 322 including semi-perfect gases, real gases, vapors, mixture of gases, and combustion.
Text: Jones and Hawkins, *Engineering Thermodynamics*.
Mr. Hinton and Staff.

M.E. 324. Thermodynamics
3-0-3. Prerequisite: M.E. 323.
Applications of thermodynamics to engineering systems including vapor cycles, gas cycles, nozzles, turbines, compressors, and refrigeration.
Text: Jones and Hawkins, *Engineering Thermodynamics*.
Mr. Hinton and Staff.

M.E. 334. Mechanical Equipment of Buildings
3-0-3. Prerequisite: Phys. 209 or 213.
Principles of water supply, plumbing and heating are studied. Design features of various types of heating systems are considered.
Staff.

M.E. 335. Mechanical Equipment of Buildings
2-3-3. Prerequisite: M.E. 334.
Principles of air conditioning are studied. Application of heating and air conditioning principles to practical design problems is carried out during the laboratory period.
Staff.

M.E. 350. Instruments Laboratory
0-3-1. Prerequisites: M.E. 320 or 322 or parallel.
Principles of measurement, accuracy of instruments and data analysis are discussed. Instrumentation employed includes: planimeters, pressure and temperature measuring devices, speed, torque and power elements.
Mr. Barfield and Staff.

M.E. 353. Materials Laboratory
0-3-1. Prerequisites: Mech. 332 or Mech. 336, or parallel.
Basic methods of determining and evaluating phenomenological properties of engineering materials are experimented with. Stress analysis instrumentation is introduced.
Staff.

M.E. 367. Machine Design
4-3-5. Prerequisites: Mech. 302 and 332.
Kinematics, stress analysis methods, machine elements, and fundamental machine design principles are studied.
Mr. Vidosic and Staff.

M.E. 403. Metal Cutting Principles
2-3-3. Prerequisites: M.E. 208, M.E. 309, Mech. 337.
Basic cutting processes are analyzed. Tool geometry, chip formation and machining economics are among the topics studied. Experiments dealing with the measurement of cutting forces, grinding ratios and tool life are conducted.
Text: Notes.
Mr. Vidosic.

M.E. 410. Materials Engineering
2-3-3. Prerequisite: M.E. 309.
Ceramic and organic materials are introduced. Macrostructural effects are considered, and the mechanical, thermal, electrical, chemical and irradiation behaviour studied.
Mr. Vidosic and Staff.

M.E. 415. Heat Transfer
3-0-3. Prerequisite: M.E. 311 and 315.
Laminar and turbulent convection, boiling, condensation, and demonstrations of the pertinent principles are emphasized. Design problems involving combinations of the basic heat transfer mechanisms are considered.
Text: To be selected.
Mr. Sunderland and Staff.
M.E. 420. Internal Combustion Engines
3-3-4. Prerequisites: M.E. 311, 315 and 324.
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. The laboratory is devoted to experimental study of engines and their component parts.
Text: Obert, Internal Combustion Engines.
Mr. Allen and Staff.

M.E. 421. Heating, Ventilating and Air Conditioning
3-3-4. Prerequisites: M.E. 324, M.E. 415 or parallel.
The theory of heating, ventilating and air conditioning and its application to engineering systems. The laboratory work includes tests on equipment and materials pertinent to the field.
Text: Carrier, Cherne, Grant, and Roberts, Modern Air Conditioning, Heating and Ventilating.
Mr. Hinton and Staff.

M.E. 422. Power Plant Engineering
3-3-4. Prerequisite: M.E. 324 and 415.
Modern power plant cycles, pumps, piping, fans, fuels, steam generators, boiler auxiliaries, heat exchangers and the economics of power plants are studied. The laboratory work consists of tests of equipment pertaining to the subject.
Text: Zerban and Nye, Power Plants.
Mr. Holland and Staff.

M.E. 425. Engineering Analysis
3-0-3. Prerequisite: M.E. 415, or parallel.
Methods of analysis of engineering situations requiring application of fundamentals of engineering sciences are studied. Projects requiring synthesis and analysis of engineering systems will be assigned.
Text: Notes.
Mr. Gorton.

M.E. 426. Principles of Turbomachinery
3-0-3. Prerequisite: M.E. 311.
Principles underlying all forms of turbomachinery are studied. Application of these principles is made to give a unified treatment of pumps, compressors, and turbines.
Text: Shepherd, Principles of Turbomachinery.
Mr. Hinton.

M.E. 427. Combustion and Flames
3-0-3. Prerequisite: M.E. 311, 315, and 324, or consent of instructor.
Stoichiometric and thermochemical analyses of the principal fuel air reactions are to be examined. Concepts of modern theories of combustion and flame propagation are presented.
Mr. Shepard.

M.E. 428. Elements of Rocket Systems
3-0-3. Prerequisite: M.E. 415 or parallel.
Basic elements, ballistics, and technical problems associated with the design of propulsion systems for solid and liquid propellant rockets are considered.
Text: Sutton, Rocket Propulsion Elements.
Mr. Shepard.

M.E. 429. One-Dimensional Compressible Flow
3-0-3. Prerequisite: M.E. 311.
An intermediate study of one dimensional compressible flow systems related to Mechanical Engineering.
Mr. Carlson.

M.E. 431. Refrigeration
3-0-3. Prerequisite: M.E. 324.
A study of the compressor, condenser, piping and accessories of the refrigeration plant, and other practical applications of the principles of refrigeration.
Text: Jordan and Priester, Refrigeration.
Mr. Holland.

M.E. 432. Steam Turbines
3-0-3. Prerequisite: M.E. 324.
A detailed study of the design and operation of steam turbines.
Text: Church, Steam Turbines.
Mr. Holland and Staff.
M.E. 439. Gas Turbines
3-0-3. Prerequisites: M.E. 311 and 324.
The theory and the design of gas turbines and jet engines and the various applications of these engines.
Mr. Allen.

M.E. 443. Heating, Ventilation, and Air Conditioning Design
3-0-3. Prerequisite: M.E. 421. A continuation of M.E. 421. The subject matter emphasizes the design of various systems, including automatic controls, and the selection of equipment.
Mr. Hinton.

M.E. 445. Principles of Automatic Control
3-0-3. Prerequisite: Math. 305. Fundamental principles and generalized behavior of closed loop linear systems are examined. Pneumatic, mechanical, and electrical control systems are applied to pressure, flow, speed, temperature, and position control.
Mr. E. Harrison.

M.E. 447. Elements of Nuclear Power
3-0-3. Prerequisite: M.E. 415 or concurrently, or equivalent. 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: To be selected. Mr. Barnett.

M.E. 467. Machine Design
3-3-4. Prerequisites: Mech. 303, 332. Kinematics and dynamics of machinery—motion, velocity, acceleration and inertia forces—are studied. A few principles of mechanism synthesis are introduced.
Mr. Johnson and Staff.

M.E. 480. Dynamics of Machinery
2-3-3. Prerequisite: M.E. 467. Dynamic forces in machines, balancing and dynamics of reciprocation are studied. Cam dynamics and dynamics of feedback controls are also introduced.
Mr. Murphy.

M.E. 481. Machine Design
3-3-4. Prerequisites: M.E. 467, Mech. 337 and M.E. 410 or concurrently. Principles of design—synthesis and analysis—are introduced. The application of engineering mechanics to the design and selection of machine elements is then pursued. Component design projects are undertaken in the laboratory.
Mr. Vidosic and Staff.

M.E. 482. Machine Design
3-3-4. Prerequisites: M.E. 410 and M.E. 481. Study of the design process is continued. Decision theory, creativity concepts, particular design factors and optimization are considered. Systems design include projects undertaken as laboratory exercises.
Mr. Vidosic and Staff.

M.E. 491. Seminar
1-0-1. (Winter quarter only). Prerequisite: Senior standing in Mechanical Engineering.
Civic and professional responsibilities and opportunities are brought to students by leaders in engineering, business, and community affairs.
Staff.

M.E. 496-7-8-9. Special Problems in Mechanical Engineering
0-9-3, 0-6-2, 0-3-1, 0-12-4, respectively. Prerequisite: Senior standing in Mechanical Engineering.
These courses are for the student who is interested in creative work.
Staff.
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<td>Nuclear Reactor Technology II</td>
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<td>M.E. 602</td>
<td>Nuclear Reactor Technology II</td>
<td>3-0-3</td>
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<tr>
<td>M.E. 622, 3, 4</td>
<td>Thermodynamics</td>
<td>3-0-3</td>
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<td>M.E. 630</td>
<td>Heating, Ventilation and Air Conditioning</td>
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<td>M.E. 631</td>
<td>Advanced Refrigeration</td>
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<td>M.E. 636</td>
<td>Internal Combustion Engine Design</td>
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<td>M.E. 671</td>
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<td>M.E. 672, 673</td>
<td>Fabrication of Metals</td>
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<td>M.E. 674, 675</td>
<td>Variational Methods in Engineering</td>
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<td>M.E. 676</td>
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<td>Magnetogasdynamics III</td>
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(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)
Department of Military Science
(Established in 1917)


Reserve Officers' Training Corps

The Federal Government offers instruction at Georgia Institute of Technology, a Senior Division of the Army Reserve Officers' Training Corps, in six branches: Air Defense Artillery, Chemical Corps, Corps of Engineers, Infantry, Ordnance Corps, and Signal Corps. All branches are open to regular advanced course students and students enrolled under the Co-operative Plan. General objectives of the course of instruction are to produce junior officers possessing qualities and attributes essential to their progressive and continued development as officers in the United States Army Reserve 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. The first year of the basic course consists of approximately 70 hours of instruction, and the second year approximately 90 hours. The advanced course consists of approximately 110 hours of instruction each year and the addition of a six-week summer camp.

Academic Credit

Academic credit is granted for the completion of military courses as indicated in the sections that follow. However, not more than 9 hours credit in advanced ROTC courses may be applied toward a degree.

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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:

<table>
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</thead>
<tbody>
<tr>
<td>Basic Course</td>
<td>$75.00</td>
</tr>
<tr>
<td>Advanced Course</td>
<td>$100.00</td>
</tr>
</tbody>
</table>

Prior to formal enrollment in the ROTC basic or advanced course, each student will deposit with the Cashier of Georgia Tech the appropriate amount shown above. The receipt of this deposit will then be taken to the Uniform Accounts Office where a Purchase Order will be issued to the depositor. This Purchase Order must be presented to the supplier of ROTC uniforms used in the ROTC program for proper fitting and issuance of items of uniform and insignia. Uniforms become the property of the individual and are not returnable for reimbursement once they have been issued.

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 and is reimbursed to the student upon completion of the advanced course. The uniform allowance for basic students is $50.00 and is reimbursed to the student on the basis of one-sixth of the total per quarter of enrollment satisfactorily completed.

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, normally $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 for the summer following the junior year. For each unexcused absence from an hour of instruction, an amount equivalent to two days' commutation, $1.80, will be deducted from the student's next payment of commutation.

The Basic Course

The basic course consists of formal instruction for two hours per week for two academic years of at least 30 weeks each, with the exception of one quarter of the freshman year. During this quarter the student will attend drill only. Subjects included in the basic course are the same for all students. During the sophomore year, selection is made of students considered eligible for enrollment in the advanced course. Note: All quarters include instruction in Leadership, Drill and Exercise of Command, to provide for leadership training, drill experience, and the development of certain essential characteristics of leadership such as initiative and self-confidence, through progressive training; also, to provide a thorough indoctrination in military courtesy and customs of the service.
M.S. 101. Leadership, Drill, and Exercise of Command: Individual Weapons and Marksmanship
2-1-2.
Leadership, Drill, and Command, stressing fundamentals on small unit level. Marksmanship training on indoor range. Mechanical functioning, disassembly, assembly, and employment with .30 and .22 cal. rifles.

M.S. 102. United States Army and National Security: Organization of the Army and ROTC
2-1-2.
Missions and responsibilities of the United States Army, the United States Army Reserve, and the National Guard as members of the National defense team. History and organization of ROTC. Design of military organizations, specifically Infantry units.

M.S. 104. Leadership Laboratory (Drill)
0-1-0.
Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

M.S. 201. Military Map Reading, Individual Tactics, and Small Unit Tactics
2-1-2.
Maps and Aerial Photograph Reading, to include orientation and use of compass. Tactics of the individual soldier, and small unit tactics with emphasis on the defense.

M.S. 202. Tactics and Military History
2-1-2.
Small unit tactics emphasizing the offense. United States Military History to 1860 with emphasis on the principles of war.

M.S. 203. Military History
2-1-2.
Continuation of military history of the United States from 1861 to the present.

The Advanced Course

Students who have successfully completed the basic course and who are selected for further training may enroll in the advanced course. The advanced course is a recognized elective in all departments at Georgia Tech to the extent that nine hours of credit may be applied toward a degree providing the entire advanced course is completed. If the student does not complete the entire advanced program, ROTC credits may not be used as electives unless the student has been relieved of his contractual obligations by the Department of the Army.

Students who are members of the Naval Reserve, Marine Reserve, Coast Guard, or Air Reserve are required to terminate membership therein in order to become eligible for the advanced course. Students who are members of any Army Reserve or National Guard Unit must be transferred to a Reserve Control Group before they can sign the advanced course contract.

Upon the successful completion of the advanced course of four years' education at a college level, graduates will be tendered commissions as second lieutenants in the United States Army Reserve. 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 two quarters of military classroom instruction and one quarter of drill only in each of the junior and the senior years. Each quarter of classroom instruction includes four hours of class and one hour of drill. 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.

**Army Air Defense Artillery Section**

Any qualified student enrolled in any academic course may make application.

**M.S. 311. Fundamentals of Missile Science and Pre-Camp Orientation**

4-1-3.

The integrated air defense missile battery and its operation. Familiarization with Field Artillery principles and procedures. Preparation for summer camp.

**M.S. 312. Leadership, Military Teaching Principles, and Introduction to Guided Missiles**

4-1-3.

An introduction to the basic principles of leadership. Principles, methods and techniques of military instruction. An introduction to guided missiles and their associated equipment.

**M.S. 304. Leadership Laboratory (Drill)**

0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of “S” will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

**Chemical Corps Section**

Admission to the Chemical Corps Unit requires acceptance based on performance in Basic Military (Freshman and Sophomore years) and is in general limited to those students who are enrolled in an academic course of instruction leading to an engineering, technical, or other scientific degree.

**M.S. 321. Chemical Corps Missions, Organization, Aspects of CBR Warfare and Defense**

4-1-3.

Mission, general organization, and functions of the Chemical Corps. Characteristics of Chemical, Biological and Radiological agents to in-
clude employment, detection, defense against decontamination and munitions.

**M.S. 322. Leadership, Military Teaching Principles, and Summer Camp Orientation**

4-1-3.


**M.S. 304. Leadership Laboratory (Drill)**

0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

**M.S. 421. Military Administration, Military Justice, Role of the U. S. in World Affairs**

4-1-3.

Basic military administration procedures. Fundamentals of military law. The role of the United States in World Affairs to include the recent world situation.

**M.S. 422. Operations, Logistics and Service Orientation**

4-1-3.

Military operations and logistics to include command and staff functions, estimate of the situation, combat orders, troop movements, supply and evacuation. Active service orientation.

**M.S. 404. Leadership Laboratory (Drill)**

0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

**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.

**M.S. 331. Leadership, Methods of Military Teaching Principles, and Field Fortifications**

4-1-3.

An introduction to the basic principles of leadership. Principles, methods and techniques of military instruction. Field fortification construction.

**M.S. 332. Military Structures, Use of Explosives, and Mine Warfare**

4-1-3.


**M.S. 304. Leadership Laboratory (Drill)**

0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

**M.S. 431. Engineer Logistics, Staff Procedures, Engineer Unit Operations and Camouflage**

4-1-3.

A study of engineer logistics to include unit supply, troop movements, and motor transportation. Organization, function, and duties of staffs.
Employment and utilization of engineer units in all types of operations. Camouflage construction.

**M.S. 432. Military Administration, Military Justice and the Role of the U. S. in World Affairs** 4-1-3.

Basic concepts of military administration. Fundamentals of military law, justice, and court procedures. Orientation on geographical and economic factors which influence the role of the United States in World Affairs.

**M.S. 404. Leadership Laboratory (Drill)** 0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

### Infantry Section

Any qualified student enrolled in any academic course may make application.

**M.S. 341. Infantry Tactics and Techniques** 4-1-3.

Military fundamentals common to all branches including leadership, military teaching principles, individual night training and patrolling.

**M.S. 342. Infantry Tactics and Techniques** 4-1-3.

Organization of Infantry units to include the Division. Techniques of tactical estimates and preparation of combat orders. Communication principles, techniques and equipment. Tactical employment of Infantry units to include the Company.

**M.S. 304. Leadership Laboratory (Drill)** 0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

### Ordnance Corps 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.
M.S. 351. Ordnance Tactics and Techniques
4-1-3.
An introduction to the organization and mission of the Ordnance Corps. The characteristics, design, and capabilities of small arms, automotive components, ammunition, artillery, guided missiles, and nuclear weapons employed by the Army.

M.S. 352. Ordnance Tactics and Techniques
4-1-3.
An analysis of the problems of maintenance and supply of Ordnance materiel for a global Army. An introduction to military leadership and military teaching methods with emphasis on student instruction.

M.S. 304. Leadership Laboratory (Drill)
0-1-0.
Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of “S” will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

M.S. 451. Ordnance Tactics and Techniques
4-1-3.
Army administration as a tool of management. An introduction to military justice procedures. The role of the U.S. in world affairs.

M.S. 452. Ordnance Tactics and Techniques
4-1-3.
A survey of the various tools of management used to accomplish the Ordnance mission; including operations research, linear programming, automatic data processing systems and the modern Army supply system. Service orientation.

M.S. 404. Leadership Laboratory (Drill)
0-1-0.
Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of “S” will be given for satisfactory completion of this course. No preparation is required and no tests will be given.

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.

M.S. 361. Leadership, Military Teaching Principles, Signal Communication Materiel
4-1-3.
Instruction in the principles of leadership. A study of the principles, methods and techniques of military instruction. Introduction to communication materiel.

M.S. 362. Signal Corps Tactics and Techniques
4-1-3.
A study of the various means of communication to include telephony, telegraphy, carrier, HF, VHF and microwave systems. Discussion of higher echelon communication systems. An introduction to the global communication network of the U.S. Army.

M.S. 304. Leadership Laboratory (Drill)
0-1-0.
Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of “S” will
be given for satisfactory completion of this course. No preparation is required and no tests will be given.

**M.S. 461. Signal Corps Operations, Logistics, Service Orientation**

4-1-3.

A study of staff organization and functions, including supply and evacuation, troop movements and motor transportation. Service orientation to prepare the future officer for active service.

**M.S. 462. Army Administration, Military Justice, Role of the U. S. in World Affairs**

4-1-3.

Basic concepts and fundamentals of Army Administration and mess management. Fundamental concepts of military justice in the Armed Forces of the United States. Role of the U. S. in world affairs.

**M.S. 404. Leadership Laboratory (Drill)**

0-1-0.

Military drill period will be attended, in uniform, by students enrolled in the Army ROTC program. Attendance and aptitude marks will be assigned, and a grade of "S" will be given for satisfactory completion of this course. No preparation is required and no tests will be given.
Department of Modern Languages

Department Head—James D. Wright; Professor Emeritus—Joseph A. Campomor; Professor—George F. Walker, II; Associate Professor—Louis J. Zahn; Assistant Professor—James Gough, Jr.; Instructors—John S. Austin, Jr., John R. Canavan, William A. Templer, Roy O. Wyatt.

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. In facilitation of the effort to attain these goals the Department attempts to section, according to ability and/or preparation, its first- and/or second-year students of those languages which attract enrollments either large enough to support such sectioning or specifically qualified to do so. The enrollment in first- and second-year German and that in second-year Spanish consistently permit this sectioning.

A student taking a language in which he has two or more years of high school credit must schedule the first course of the 200 series in that language. If such a student fails this course, he must take the entire 100 series of courses in order to receive credit toward graduation for study of the language in question. If he passes this course with the grade of “D,” he may take for credit toward graduation either the second- and third-quarter courses of the 100 series or succeeding courses of the 200 series. If he passes this course with a grade of “C” or higher, he must take succeeding courses of the 200 series in order to receive further credit for his study of the language in question. A student who elects to take courses in a language which he speaks as a native language must also schedule the first course of the 200 series. Otherwise such students may schedule the beginning course of another language.

Of the two series of second-year courses in Spanish, the first, M.L. 213-214-215, is intended for those students who are eligible for second-year Spanish but who do not possess native, or virtually native, fluency in the language. The second of these series, M.L. 216-217-218, is intended for those students who are eligible for second-year Spanish and who do possess native, or virtually native, fluency in the language. The same credit is given for each series of these courses.

With departmental permission, those students who complete, with outstanding success, the first series of these courses, M.L. 213-214-215, may then take for full credit the second series, M.L. 216-217-218. No student, however, who first takes for credit M.L. 216-217-218 as his second-year Spanish courses, may thereafter receive credit for taking M.L. 213-214-215.

The two series of second-year German courses, M.L. 201-202-203 and M.L. 204-205-206, bear a relationship to each other identical in every respect with that between the two series of second-year Spanish courses, M.L. 213-214-215 and M.L. 216-217-218, except that M.L. 204-205-206 is not intended specifically for students who possess native, or virtually native, fluency in German. Rather, it is intended for English-speaking students of more advanced proficiency in German than is expected in M.L. 201-202-203.

Credit for courses of the 200 series is given on a quarterly basis. Credit for courses of the 100 series is given only after completion of the full three quarters.
Students who are registered under the Co-operative Plan and who study the elementary course of a foreign language 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.
   Pronunciation; essential principles of German grammar; rapid acquisition of vocabulary by the reading of simple selections; elementary composition.
   Text: von Hofe, Der Anfang.
   Mr. Wright and Staff.

M.L. 102. Elementary German
3-0-3. Prerequisite: M.L. 101 or equivalent.
   Continuation of the work of M.L. 101.
   Text: von Hofe, Der Anfang.
   Mr. Wright and Staff.

M.L. 103. Elementary German
3-0-3. Prerequisite: M.L. 101 and 102 or equivalent.
   Reading of German scientific and general material and the acquisition of a large scientific vocabulary; continued study of German grammar; composition.
   Texts: von Hofe, Der Anfang; Wild, An Introduction to Scientific German.
   Mr. Wright and Staff.

M.L. 107. Elementary French
3-0-3. Prerequisite: None.
   Essential principles of French grammar; acquisition of vocabulary through simple conversational exercises and the reading of simple selections.
   Text: Buffum and Michaud, Practical Conversational French.
   Mr. Walker and Staff.

M.L. 108. Elementary French
3-0-3. Prerequisite: M.L. 107 or equivalent.
   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: Buffum and Michaud, Practical Conversational French; Hills and Dondo, La France.
   Mr. Walker and Staff.

M.L. 109. Elementary French
3-0-3. Prerequisite: M.L. 107 and 108 or equivalent.
   Reading of selected texts; composition; completion of the survey of French grammar.
   Texts: Buffum and Michaud, Practical Conversational French; Hills and Dondo, La France.
   Mr. Walker and Staff.

M.L. 113. Elementary Spanish
3-0-3. Prerequisite: None.
   Pronunciation; elementary grammar; reading; composition; simple conversational exercises.
   Texts: Turk, Foundation Course in Spanish; O'Connor and Haden, Oral Drill in Spanish.
   Mr. Zahn and Staff.

M.L. 114. Elementary Spanish
3-0-3. Prerequisite: M.L. 113 or equivalent.
   Continuation of M.L. 113; increased emphasis on reading and conversation.
   Texts: Turk, Foundation Course in Spanish; O'Connor and Haden, Oral Drill in Spanish.
   Mr. Zahn and Staff.
**M.L. 115. Elementary Spanish**
3-0-3. Prerequisite: M.L. 113 and 114 or equivalent.
A continuation of M.L. 114; completion of Spanish grammar.

**M.L. 154. Elementary Russian**
3-2-4. Prerequisite: For matriculating freshmen and for sophomores, two years or more of high school training in any foreign language(s), ancient or modern, and selection on the basis of departmentally established criteria.

For all other students, college credit for two years’ study of one foreign language or for one year’s study of each of two or more foreign languages.

For all students, exceptions at the discretion of the staff.

During three class hours—to be scheduled at registration—conventional study of grammar and illustrative reading. During two laboratory hours—to be scheduled after registration—intensive familiarization with recorded study material.

Text: Potapova, *Russian*. Mr. Thornton.

**M.L. 155. Elementary Russian**
3-2-4. Prerequisite: M.L. 154 or equivalent.
Continuation of M.L. 154; introduction of additional reading material as progress of class permits.
Texts: Potapova, *Russian*; additional reading material. Mrs. Thornton.

**M.L. 156. Elementary Russian**
3-2-4. Prerequisite: M.L. 154 and M.L. 155 or equivalent.
Continuation of M.L. 154 and M.L. 155; emphasis on the reading of simple prose.
Texts: Potapova, *Russian*; additional reading material. Mrs. Thornton.

**M.L. 201. Intermediate German**
3-0-3. Prerequisite: Three quarters of Elementary German or equivalent.
Reading of German scientific and technical material; individual problems to conform, whenever possible, with the student’s special branch of engineering.
Text: To be selected.

Mr. Wright and Staff.

**M.L. 202. Intermediate German**
3-0-3. Prerequisite: M.L. 201 or equivalent.
Continuation of training given in M.L. 201. Note: M.L. 201 and 202 are a suitable combination of courses for graduate students who have a knowledge of elementary German and who wish to prepare for reading-knowledge tests for advanced degrees.
Text: Phelps and Stein, *The German Scientific Heritage*.

Mr. Wright and Staff.

**M.L. 203. Advanced German**
3-0-3. Prerequisite: M.L. 201 and 202 or equivalent.
Reading of German prose in support of the development achieved in M.L. 201 and 202.
Text: To be selected.

Mr. Wright and Staff.

**M.L. 204. Intensive Intermediate German**
3-0-3. Prerequisite: Completion of the intensive courses of the 100 series and/or satisfactory completion of M.L. 201-202-203; otherwise, permission of the staff.

Review of grammar; study of twentieth-century prose; intensive practice in conversation; collateral translation of selection(s) from scientific literature of each student’s major field.

Mr. Gough, Mr. Canavan.

**M.L. 205. Intensive Intermediate German**
3-0-3. Prerequisite: M.L. 204 or equivalent.
Continuation of M.L. 204, except in that collateral scientific material is read voluntarily.
M.L. 206. Introduction to the German Novelle
3-0-3. Prerequisite: M.L. 204 and M.L. 205 or equivalent.
Collateral and class reading of selected nineteenth- and/or twentieth-century prose Novellen; written and/or oral reports; class discussion. Course conducted in German.

M.L. 207. Intermediate French
3-0-3. Prerequisite: Three quarters of Elementary French or equivalent.
Reading of novels and short stories intended to give the student a large general vocabulary; review of French grammar.

M.L. 208. Intermediate French
3-0-3. Prerequisite: M.L. 207 or equivalent.
A continuation of M.L. 207 with selected readings in the student’s special field.
Texts: Bagley and Diller, *La France d’autrefois et d’aujourd’hui*; Miller, *First Readings in French Literature*. Mr. Walker.

M.L. 209. Advanced French
3-0-3. Prerequisite: M.L. 207 and 208 or equivalent.
Readings from French literature, including scientific selections.

M.L. 210. Intermediate Spanish
3-0-3. Prerequisite: Three quarters of Elementary Spanish or equivalent.
Review of grammar; composition; conversation; reading; vocabulary building.

M.L. 211. Intermediate Spanish
3-0-3. Prerequisite: M.L. 210 or equivalent.
Continuation of review of grammar; composition; conversation; reading.

M.L. 214. Intermediate Spanish
3-0-3. Prerequisite: M.L. 213 or equivalent.
Continuation of review of grammar; composition; conversation; reading.

M.L. 215. Advanced Spanish
3-0-3. Prerequisite: M.L. 213 and 214 or equivalent.
Readings from Spanish literature; conversation; composition.

M.L. 216. Survey of Spanish Literature
3-0-3. Prerequisite: Native knowledge of or considerable fluency in Spanish. Students whose native language is not Spanish admitted only by permission of staff.
Spanish civilization as reflected in literary masterpieces from the Middle Ages to the present. Readings; lectures; discussions.
Texts: To be selected. Mr. Zahn.

M.L. 217. Survey of Spanish Literature
3-0-3. Prerequisite: Same as for M.L. 216.
Continuation of M.L. 216.
Texts: To be selected. Mr. Zahn.

M.L. 218. Survey of Spanish Literature
3-0-3. Prerequisite: Same as for M.L. 216.
Continuation of M.L. 217.
Texts: To be selected. Mr. Zahn.

M.L. 251. Intermediate Russian*
3-0-3. Prerequisite: M.L. 154-155-156 or equivalent.
Reading of short literary selections; acquisition of a large vocabulary; oral practice in the language. Review of Russian grammar; analysis of word and sentence structure.
Texts: To be selected. Staff.
M.L. 252. Intermediate Russian*

3-0-3. Prerequisite: M.L. 251 or equivalent.
Continuation of reading and conversation; composition; translation. Reading of Russian newspapers and journals.
Text: To be selected. Staff.

*Second-year courses in Russian offered in alternate years only.

M.L. 253. Advanced Russian*

3-0-3. Prerequisite: M.L. 251 and 252 or equivalent.
Reading of Russian scientific literature from various sources.
Text: To be selected. Staff.
Department of Music

Director—Walter C. Herbert; Band Director—Ben Logan Sisk.

General Information

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 instrumentation to numerous national concert tours, and an appearance on the Ed Sullivan show. The Glee Club and the band appeared together at the 1961-62 Gator Bowl game.

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.

tal 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.

In recent years the Glee Club, which is directed by Mr. Herbert, has appeared in Europe, Greenland, Iceland, Bermuda and Newfoundland, in addi-

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.

Course will consist of two hours of 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.* Mr. Herbert.

**Music 202. Choral Music—Conducting**

1-2-1. Prerequisites: 1. Satisfactory completion of three quarters in Glee Club; 2. Approval of the Director of Music.

Laboratory work will consist of rehearsal and performance of choral music. Third hour will include practice conducting by the students.

Text: Bauman, *Elementary Musicianship.* Mr. Herbert.

**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.

Theoretical material of this course is a study of the operas presented during the spring quarter in Atlanta by the Metropolitan Opera Association, which can be attended free of charge by the Glee Club members.

**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.

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).


**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.

Text: "National School Band Manual."  
Mr. Sisk.

**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.

Continuation of all procedures listed under Music 302 plus a resumption of the marching drill and performance which is begun in Music 301.

Mr. Sisk.
Department of Naval Science
(Established in 1926)

Commanding Officer and Professor of Naval Science—Captain Richard Henry Woodfin; Executive Officer and Associate Professor—Commander Lester Don Olson; Assistant Professors—Lieutenant Colonel Frank W. Harris, III (USMC); Lieutenant Commanders John W. Jones, Daniel J. Moss and Rex M. Williams; Lieutenants Howard L. York and Albert T. Scott; Instructors—Senior Chief Fire Control Technician Francis P. Dunne, Chief Storekeeper Horace D. Smith, First Sergeant Kenneth E. Beabout (USMC), Chief Gunner’s Mate Edward A. St. Jean, Chief Quartermaster Roy J. Fluker, and Yeoman First Class Leonard V. Richards; Secretaries—Mrs. Virginia McDonald, and Mrs. Mary C. Redd.

General

Navy 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 flight training or for a commission in the Civil Engineer Corps during the Senior year. A Flight Indoctrination Program consisting of ground and flight training is conducted by a civilian flying school during the senior year for those Navy ROTC students qualified for naval flight training who agree to apply for Naval Flight Training upon commissioning. Obligated service for flight training graduates is 42 months after designation as a Naval aviator. The NROTC is composed of two types of students: Regular and Contract.

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 prescribed Naval Science curriculum, to make a cruise of from six to eight weeks each summer, to accept a commission as Ensign, USN, or Second Lieutenant, USMCR, upon graduation, and to serve on active duty for four years after commissioning unless earlier released by the Navy Department. If they do not desire to remain in the Regular Navy or Marine Corps, they are ordered to inactive duty in the Naval Reserve or Marine Corps Reserve, for two years. At the end of this period their obligation to the Navy, or Marine Corps, 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 six 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 three years after commissioning in the Navy or in the Marine Corps if called by the Secretary of the Navy and remain a member of the Reserve Component of the U. S. Naval Service, or Marine Corps, until the
sixth anniversary of receipt of original commission. After receiving their commission they may apply for integration in the Regular Navy or Marine Corps. 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. In addition, a faculty committee annually nominates one contract freshman to the Chief of Naval Personnel for a regular scholarship.

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 for the contract program 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 their freshman year, attending three (3) hours of Naval Science class and one (1) hour of associated laboratory or drill each week.

Sophomores follow the same curriculum, attending three (3) hours of Naval Science class and one (1) hour of associated laboratory or drill each week, except that Mechanical Engineering students in good standing may substitute upon request of the Professor of Naval Science N.S. 233 (0-1-0) for N.S. 223 (3-1-2) without being required to make up the credit hours. Students desiring Supply Corps or Marine Corps commissions, submit applications to follow subject curriculum during their junior and senior years.

Junior Line students will attend three (3) hours of Naval Science class and two (2) hours of associated laboratory and drill each week.

Junior Marine Option and Supply Option students will attend three (3) hours of Naval Science class appropriate to the type of commission sought and two (2) hours of associated laboratory and drill each week, except that during the first quarter, General Psychology (Psy. 303) or Industrial Psychology (Psy. 401) will be studied in lieu of Naval Science. Students during this quarter will
attend the appropriate laboratory or drill sessions with no additional credit being earned.

Senior Line students will attend three (3) hours of Naval Science class and two (2) hours of associated laboratory and drill each week, except during the first quarter, General Psychology (Psy. 303) or Industrial Psychology (Psy. 401) will be studied in lieu of Naval Science. Students during this quarter will attend appropriate Naval Science laboratory and drill for which no additional credit will be earned.

Senior Marine Option and Supply Option students will attend three (3) hours of Naval Science class and appropriate laboratory and drill each week.

No more than a total of nine (9) hours of credit in Advanced Naval Science courses may be applied toward a degree.

Courses of Instruction

Note: 3-2-3 means 3 hours class, 2 hours laboratory, 3 hours credit.

N.S. 111. Naval Orientation and Introduction to History of Sea Power 3-1-2.
A study of the NROTC program and the Naval Service, its mission, ideals, standards, traditions, customs and the duties required of the midshipman. Also an introduction to the study of the influence of sea power on history.

A study of the concepts of sea power from early world history until the rise of the United States as a world sea power stressing: (1) the influence of sea power upon history; (2) the evolution of naval tactics; (3) the rationale of strategic decision; (4) the development of naval weapons; (5) the characteristics of successful leadership; and (6) the evolution of amphibious doctrine.

A study of the concepts of sea power from the rise of the United States as a world sea power until the present, stressing: (1) the influence of sea power upon history; (2) the evolution of naval tactics; (3) the rationale of strategic decision; (4) the development of naval weapons; (5) the characteristics of successful leadership; and (6) the evolution of amphibious doctrine.

A study of the science of ballistics, stressing the application of physics and trigonometry. A study of the design of naval weapons and the principles of hydraulic and pneumatic systems as applied to weapon design. A study of the principles of electrical and electro-hydraulic systems as applied to the control and operation of naval weapons. Solution of fire control problems by computer systems.

A study of the employment of weapon systems in fleet operations with special emphasis on guided missiles. A study of future trends and an introduction to space technology. A study of the general physics and chemistry as applied to naval propulsion plants and ship systems.

A study of the principles and applications of marine stability. An introduction to the physics of nuclear power. A study of the principles of nuclear reactors and the problems connected with these power plants. (Mechanical Engineering majors in good standing may be excused from this course upon request.)
N.S. 233. Naval Science Laboratory
0-1-0.
Naval laboratory exercises and military drill. No preparation is required and no tests will be given. The grade of "S" will be given for satisfactory completion of this course. Aptitude marks will be assigned.

N.S. 344. Navigation—Part I
3-2-3.
A study of the sciences and mathematical techniques involved in the solution of navigational aids, instruments, tables, and almanacs. Introduction to celestial navigation.

3-2-3.
A study of the science of celestial navigation by application of the theory and principles of nautical astronomy and spherical trigonometry. Introduction to the elements and principles of operations at sea.

N.S. 346. Naval Operations—Part II
3-2-3.
A study of the elements and principles of operations at sea designed to provide an understanding of command responsibility and to develop command capabilities. The following studies are emphasized: (1) international and U.S. regulations governing waterborne traffic, (2) current tactical doctrine, (3) relative motion problems, and (4) offensive and defensive employment of naval forces, (5) fleet communications and electronic counter-measures, and (6) the relationship of meteorological phenomena to operations at sea.

N.S. 443. Principles and Problems of Leadership—Part II
3-2-3.
This course is divided into two phases. Phase one is a study of the fundamental functions of management—planning, organizing, activating, and controlling; with emphasis upon the responsibility of naval officers in connection therewith. Phase two emphasizes the naval officer's leadership responsibility in connection with administration, education, training, and morality. Supporting this is a brief study of the naval judicial system and the role of discipline in leadership.

N.S. 444. Naval Science Laboratory
0-2-0.
Naval laboratory and military drill. Laboratory exercises cover case studies of situations requiring exercise of human understanding and leadership; military drill emphasizes leadership. No preparation is required and no tests will be given. The grade of "S" will be given for satisfactory completion of this course. Aptitude marks will be assigned. This course must be taken by all Line Senior Midshipmen during the Fall Quarter. Psychology 303 or 401 should be scheduled concurrently with this course, unless previously scheduled due to requirements of major.

3-2-3.
A study of concepts of leadership, effective group communication, relationships between the leader and the group, motivation of a group, and the role of mental health in management of personnel.

Supply Corps Option

N.S. 351. Naval Science Laboratory
0-2-0.
Supply Corps laboratory exercises and military drill, emphasizing leadership. No preparation is required and no tests will be given. The grade of "S" will be given for satisfactory completion of this course. Aptitude marks will be assigned. This course must be taken by all Junior Supply Corps Option Midshipmen during the Fall Quarter. Psychology 303 or 401 should be scheduled concurrently with this course.
N.S. 352. Supply Organization and Logistics, Naval Finance
3-2-3.
Supply Organization and Logistics is a study of the Naval material logistic support which deals with the procurement and distribution of required material. Naval Finance is a study of the basic fiscal functions of the Department of the Navy and the legislative action involved in the Federal Budget system.

N.S. 353. Naval Accounting, Basic Supply Afloat
3-2-3.
Naval Accounting is a study of the fidelity and statistical accounting methods employed by the Navy. Basic Supply Afloat is a study of the organization and administration of a supply department aboard ship.

N.S. 451. Advanced Supply Afloat—Part I
3-2-3.
A study of the management methods employed by a supply officer aboard ship. It includes the following areas: procurement, inventory control, distribution, and financial management of material.

N.S. 452. Advanced Supply Afloat—Part II
3-2-3.
A continuation of the study of management methods employed by a supply officer covering the procurement, merchandising and accounting procedures for conducting retail sales.

N.S. 453. Principles and Problems of Leadership
3-2-3.
A study of the basic principles, problems, and techniques for effective management and leadership. Includes case studies of leadership situations. The Midshipman is also given an introduction to military law, the administration of courts-martial, and the role of discipline in leadership.

Marine Corps Option
N.S. 361. Naval Science Laboratory
0-2-0.

Marine Corps laboratory exercises and military drill, emphasizing leadership. No preparation is required and no tests will be given. The grade of "S" will be given for satisfactory completion of this course. Aptitude marks will be assigned. This course must be taken by all Junior Marine Corps Option Midshipmen during the Fall Quarter. Psychology 303 or 401 should be scheduled concurrently with this course.

N.S. 362. Modern Basic Strategy and Tactics
3-2-3.
A study of the science of modern strategy and tactics, emphasizing the nine Principles, four Strands, and three Variables of military operations.

N.S. 363. Evolution of the Art of War—Part I
3-2-3.
A study of military history, emphasizing the development of the Art of War from the earliest recorded time through World War I.

N.S. 461. Evolution of the Art of War—Part II and Amphibious Warfare—Part I
3-2-3.
A study of the evolution of the Art of War from the end of World War I to the present, with particular emphasis on amphibious operations.

N.S. 462. Amphibious Warfare—Part II
3-2-3.
A study of the current U. S. amphibious warfare doctrine with particular emphasis on strategic decision in relation to amphibious warfare and the tactical employment of amphibious weapons.

N.S. 463. Principles and Problems of Leadership
3-2-3.
A study of the basic principles, problems and techniques of military leadership. Includes case studies of leadership situations. The midshipman is also given an introduction to military law, the administration of courts-martial and the role of discipline in leadership.
Department of Physical Training

*Department Head*—A. M. Coleman; *Professors*—Lyle B. Welser, Frederick R. Lanoue; *Associate Professors*—Norris C. Dean, James H. McAuley; *Assistant Professors*—John C. Hyder, Tommy Plaxico, Byron Gilbreath, and Robert Nelson; *Secretary*—Mrs. Forest H. 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 29) 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; 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 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. Swimming, tumbling, apparatus work, calisthenics, walking and running 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
The primary objective of this course is SURVIVAL, and it is designed to "drown-proof" 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. Mr. Lanoue, Mr. McAuley, and Mr. Nelson.

P.T. 102. Physical Fitness, Orientation, and Gymnastics
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 through 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:

Points
1. First fitness test................................ 10
2. Second fitness test.............................. 20
3. Sixty of the seventy skills at 1 point each...... 60
4. Attitude, hygienic practices and sportsmanship........... 10

Mr. Nelson, Mr. Wesler and Mr. McAuley.

P.T. 103. Track
Instruction and practice will be given in starting, striding, use of the arms in running, and body lean. The object of the course is to build strong legs and to increase lung and heart capacity. The minimum score to pass the course is an average grade of 60.

Grade Scale:
100 Yd. Dash
A 11 to 11.5 sec.
B 11.5 to 12 sec.
C 12 to 12.5 sec.
D 12.5 to 13 sec.

220 Yd. Dash
A 26 to 27 sec.
B 27 to 28 sec.
C 28 to 29 sec.
D 29 to 30 sec.

Quarter Mile Run (440 Yds.)
A 58 to 63 sec.
B 63 to 68 sec.
C 68 to 73 sec.
D 73 to 78 sec.

Half Mile Run (880 Yds.)
A 2 min. 30 sec. to 2 min. 40 sec.
B 2 min. 40 sec. to 2 min. 50 sec.
C 2 min. 50 sec. to 3 min.
D 3 min. to 3 min. 10 sec.

Mile Run
A 5 min. 30 sec. to 5 min. 50 sec.
B 5 min. 50 sec. to 6 min. 10 sec.
C 6 min. 10 sec. to 6 min. 30 sec.
D 6 min. 30 sec. to 6 min. 50 sec.

Mr. Dean.

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. One quarter will be devoted to indoor games, one to outdoor games and one to recreative sports.
P.T. 201. Indoor Games

Basketball will be the game 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.

Mr. Plaxico, Mr. Gilbreath, and Mr. Hyder.

P.T. 202. Outdoor Games

Softball, touch football and soccer are the basic games for this course. Baseball 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.

Mr. Gilbreath and Mr. McAuley.

P.T. 203. Recreative Sports

The class will receive instruction in the fundamentals of tennis, volleyball, and paddle ball. The purpose of the course is to provide recreational exercise and to develop an appreciation of these carry-over sports as recreation and as a means of maintaining a moderate level of physical fitness.

The student shall be graded on the proficiency he demonstrates in these sports. Attendance, attitude, and effort—except when inadequate—shall be considered only to the extent that their diligent application invariably results in greater proficiency.

Mr. Plaxico.
School of Physics
(Established in 1939)


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 increasing 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.

Registration for Junior and Senior work leading to the Bachelor's Degree in Physics will be limited to those who have demonstrated appropriate ability in their Freshman and Sophomore work.

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.
### Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem.</td>
<td>101-2-3</td>
<td>Inorganic Chemistry</td>
<td>3-3-4</td>
<td>3-3-4</td>
<td>3-3-4</td>
</tr>
<tr>
<td>Draw.</td>
<td>113</td>
<td>Engineering Graphics</td>
<td></td>
<td>0-6-2</td>
<td></td>
</tr>
<tr>
<td>Eng.</td>
<td>101-2</td>
<td>Composition and Rhetoric</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td></td>
</tr>
<tr>
<td>Eng.</td>
<td>105</td>
<td>Literature</td>
<td></td>
<td></td>
<td>3-0-3</td>
</tr>
<tr>
<td>Math.</td>
<td>100</td>
<td>Algebra-Trigonometry</td>
<td>5-0-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math.</td>
<td>104</td>
<td>Analytical Geometry and Calculus</td>
<td></td>
<td>5-0-5</td>
<td></td>
</tr>
<tr>
<td>Math.</td>
<td>201</td>
<td>Calculus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.L. **</td>
<td>**</td>
<td>Modern Language OR</td>
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<td></td>
<td></td>
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<tr>
<td>S.S.</td>
<td>111-12-13</td>
<td>Social Science</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td>3-0-3</td>
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<tr>
<td>P.T.</td>
<td>101-2-3</td>
<td>Physical Training</td>
<td>0-4-1</td>
<td>0-4-1</td>
<td>0-4-1</td>
</tr>
<tr>
<td>ROTC ***</td>
<td>***</td>
<td>ROTC</td>
<td>3-1-2</td>
<td>3-1-2</td>
<td>3-1-2</td>
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<tr>
<td>Gen.</td>
<td>101</td>
<td>Orientation</td>
<td>1-0-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td>18-8-18</td>
<td>17-14-20</td>
<td>17-8-18</td>
</tr>
</tbody>
</table>

*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. 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.

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

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>201-2-3</td>
<td>Survey of the Humanities</td>
<td>3-0-3</td>
<td>3-0-3</td>
<td>3-0-3</td>
</tr>
<tr>
<td>Math.</td>
<td>202-3</td>
<td>Calculus</td>
<td>5-0-5</td>
<td>5-0-5</td>
<td></td>
</tr>
<tr>
<td>Math.</td>
<td>305*</td>
<td>Differential Equations</td>
<td></td>
<td></td>
<td>3-0-3</td>
</tr>
<tr>
<td>Phys.</td>
<td>207-8-9</td>
<td>or Physics</td>
<td>5-3-6</td>
<td>5-3-6</td>
<td>5-3-6</td>
</tr>
<tr>
<td>P.T.</td>
<td>201-2-3</td>
<td>Physical Training</td>
<td>0-4-1</td>
<td>0-4-1</td>
<td>0-4-1</td>
</tr>
<tr>
<td>ROTC **</td>
<td>***</td>
<td>ROTC</td>
<td>3-1-2</td>
<td>3-1-2</td>
<td>3-1-2</td>
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<tr>
<td>Electives **</td>
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<tr>
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<td><strong>Total</strong></td>
<td>16-8-17</td>
<td>16-8-17</td>
<td>17-8-18</td>
</tr>
</tbody>
</table>

*Math. 304, plus an additional hour of elective credit, may be substituted for Math. 305 and 306.

***For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
### Junior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng. 315</td>
<td>Public Speaking</td>
<td></td>
<td></td>
<td>3-0-3</td>
</tr>
<tr>
<td>Math. 306</td>
<td>Differential Equations</td>
<td>3-0-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. 305</td>
<td>Laboratory Electronics</td>
<td>3-6-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. 308</td>
<td>Intermediate Electricity</td>
<td>3-0-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. 310</td>
<td>Electricity and Magnetism</td>
<td>5-6-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. 320</td>
<td>Mechanics</td>
<td>5-0-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phys. 331</td>
<td>Quantum Mechanics of Solids</td>
<td>3-0-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math. 409</td>
<td>Atomic Physics</td>
<td>3-0-3</td>
<td></td>
<td></td>
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<tr>
<td>Phys. 422</td>
<td>Light</td>
<td>5-6-7</td>
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<tr>
<td>I.M. 204</td>
<td>Economics</td>
<td>3-0-3</td>
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<tr>
<td>Approved Electives **</td>
<td></td>
<td>3-0-3</td>
<td>5-0-5</td>
<td>3-0-3</td>
</tr>
</tbody>
</table>

**Electives must include 6 hours of humanities from list on page 34. Not more than 9 hours of electives may be in advanced ROTC.**

**Approved electives may be substituted for these courses by students who do not plan to take graduate work in Physics.**

### Senior Year

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>1st Q.</th>
<th>2nd Q.</th>
<th>3rd Q.</th>
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<tbody>
<tr>
<td>Eng. 320</td>
<td>Technical Writing</td>
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<tr>
<td>Phys. 313</td>
<td>Nuclear Physics</td>
<td>5-0-5</td>
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<td>Phys. 315</td>
<td>Experimental Physics I</td>
<td>0-6-2</td>
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<td>Phys. 412*</td>
<td>Electricity and Magnetism</td>
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Totals: 17-6-19 16-6-18 17-6-19

*Approved electives may be substituted for these courses by students who do not plan to take graduate work in Physics.**

**Junior Year (Geophysics Option)**

<table>
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<td>Laboratory Electronics</td>
<td>3-6-5</td>
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<td>Phys. 308</td>
<td>Intermediate Electricity</td>
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<td>Phys. 310</td>
<td>Electricity and Magnetism</td>
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<td>Phys. 320</td>
<td>Mechanics</td>
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<td>Phys. 409</td>
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Totals: 15-12-19 16-6-18 17-6-19
Senior Year
(Geophysics Option)

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<td>Phys.</td>
<td>315</td>
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<td>0-6-2</td>
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<td>Phys.</td>
<td>424</td>
<td>Thermo. and Kinetic Theory</td>
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<td>Petrography</td>
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<td>Geol.</td>
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<td>I.M.</td>
<td>204</td>
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*Approved Electives*** 7-0-7 10-0-10 13-0-13

Totals 15-12-19 18-3-19 19-0-19

*Electives must include 6 hours of humanities from list on page 34. Not more than 9 hours of electives must be in advanced ROTC.

***Including a minimum of 9 hours chosen from Phys. 325, 412, 415, 422, 427, and 431.

Courses of Instruction

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

Phys. 207. Mechanics
5-3-6. Prerequisite: Math. 201 or concurrent.
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: Richards, Wehr, Sears, Zeman-sky, Modern University Physics.

Mr. Ewalt and Staff.

Phys. 208. Electricity
5-3-6. Prerequisites: Phys. 207, Math. 201.
Electricity and related phenomena taught as a part of the basic physics course described under Physics 207.

Text: Richards, Wehr, Sears, Zeman-sky, Modern University Physics.

Mr. Prosser and Staff.

Phys. 209. Heat, Sound and Light
5-3-6. Prerequisites: Phys. 208, Math. 201.
Heat, sound, light and atomic physics taught as a part of the basic physics course described under Physics 207.

Text: Richards, Wehr, Sears, Zeman-sky, Modern University Physics.

Mr. Prosser and Staff.

Phys. 211. Elementary Mechanics
4-0-4. Prerequisite: Math. 102.
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 demonstration of scientific equipment and methods are included under conditions which permit and require the individual students to observe the details.

Text: Smith and Cooper, Elements of Physics.

Staff.
Electricity and magnetism taught as a part of the elementary physics course described under Physics 211 above.


Phys. 213. Elementary Heat, Light and Sound
4-0-4. Prerequisite: Phys. 211.

Heat, light, sound and modern Physics taught as a part of the elementary physics course described under Physics 211 above.


Phys. 217, 218, and 219. General Physics
5-3-6. These courses may be used respectively instead of Physics 207, 208, and 209 by engineering and science students who have a particular interest in physics. They may be taken only with the approval of the School of Physics and are restricted to those who can be expected to make a grade of B or better in mathematics and physics.


Phys. 244. Introduction to Astronomy
3-0-3. Prerequisites: Math. 201, or concurrently.

A survey of astronomy with special emphasis on the applications of physics to astronomical problems. The nature and behavior of the earth, the other planets, stars, and stellar systems will be examined.


Phys. 305. Laboratory Electronics
3-6-5. Prerequisite: Physics 310. Restricted.

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.


Phys. 308. Intermediate Electricity
3-0-3. Prerequisites: Phys. 208 and Math. 203.

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.


Phys. 310. Electricity and Magnetism
5-6-7. Prerequisites: Phys. 209, Math. 305 or concurrently. Restricted.

The definition and measurement of fundamental electric and magnetic quantities, and a study of relationships that exist between them under various conditions of physical constraint. Constant, transient, and sinusoidal currents at all frequencies; capacitive and inductive effects; electric oscillations; and lines with distributed properties.

Text: Lecture and Laboratory Notes. Mr. Howey.

Phys. 313. Nuclear Physics
5-0-5. Prerequisite: Phys. 331.


Text: Kaplan, *Nuclear Physics*. Mr. Wyly.

Phys. 315. Experimental Physics I
0-6-2. Prerequisite: Concurrent with Phys. 313. Restricted.

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. Mr. Wyly.
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: Phys. 308, Math. 306, or concurrently.
Statics and dynamics of rigid bodies, with vector analysis and with application to oscillations, planetary motion, rotation of a rigid body, and impact.
Text: Symon, Mechanics. Mr. Wyly.

Phys. 325. Kinetic Theory and Statistical Mechanics
3-0-3. Prerequisites: Math. 304 or 305 concurrent, Phys. 209 or 219.
Mr. Gersch.

Phys. 331. Elementary Quantum Theory of Solids
3-0-3. Prerequisites: Phys. 209, Math. 305 or concurrent or consent of instructor.
Introduction to quantum mechanics of one dimensional systems with applications to elementary solid state physics. Emphasis will be placed on the electrical properties of solids.

Phys. 405. Electronic Phenomena
3-0-3. Prerequisites: Phys. 308 or equivalent, Phys. 409.
The physics of electronic phenomena. The subject matter includes the motion of charged bodies in electric and magnetic fields, the basic phenomena of gaseous electronics, the conduction of electricity through gases, electric discharges.
Text: von Engel, Ionized Gases. Staff.

Phys. 409. Atomic Physics
3-0-3. Prerequisites: Physics 320, 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: Slater, Modern Physics.

Phys. 412. Electric and Magnetic Fields
5-0-5. Prerequisites: Phys. 308 and 310, Math. 306.
Development of Maxwell's equations and their application to radiation problems and to the transmission of guided electromagnetic waves.

Phys. 415. Experimental Physics II
0-6-2. Prerequisite: Phys. 315, Phys. 320. Restricted.
Special experiments from various fields of physics. Emphasis is placed on good laboratory technique.
Text: None.

Phys. 416. Experimental Physics III
0-6-2. Prerequisite: Phys. 305. Restricted.
A continuation of Phys. 415.

Phys. 422. Light
5-6-7. Prerequisites: Phys. 209, Math. 306 or concurrent.
Text: Jenkins and White, Fundamentals of Optics. Mr. Crawford.

Phys. 424. Thermodynamics and Kinetic Theory
5-0-5. Prerequisites: Phys. 209, Math. 304 or Math. 306, or concurrent.


Mr. Simpson.

**Phys. 427. Elementary Quantum Mechanics**


Historical introduction, Schroedinger's equation, and probabilistic interpretation of quantum mechanics. Solutions of Schroedinger's equation in one dimension: free particle, wavepackets, particle in a box, and linear oscillator. Rigid rotator. Applications to atomic structure.

Text: Sherwin, *Introduction to Quantum Mechanics.*

Mr. Simpson.

**Phys. 429. Special Problems**

1-3-2. Prerequisite: The scheduling of this course must be approved by the School of Physics.

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. 431. Elementary Molecular and Solid State Physics**

3-0-3. Prerequisite: Physics 409, Phys. 427.

Elementary wave mechanics applied to explain some of the properties of solids and molecular gases. Molecular spectra, binding forces in molecules and solids, the free electron theory of metals, band theory of metals, semi-conductors, and transistors.


Mr. Patronis.

**Phys. 432. Introductory Diffraction Theory**

3-0-3. Prerequisites: Math. 304 or 305, Phys. 209 or 219.

Aspects of crystal symmetry and introductory theory common to electron, neutron, and X-ray diffraction are treated. The reciprocal lattice and geometric portion of the kinematic theory are developed from the Laue-Ewald point of view. Treatment of coherent scattering from continuous distributions is introduced.

Mr. Young.

**Phys. 439. Introductory Nuclear Reactor Physics**

3-0-3. Prerequisites: Phys. 209 and Math. 304 or Math 306 concurrently.

Review of nuclear physics including binding-energy, fission, neutron cross-sections and interactions. Basic theory of neutron chain reactions and the diffusion approximation. Calculations of critical mass and composition of elementary reactor systems.


Mr. Simpson.

**Phys. 497. Theory of Measurements and Instrumentation**

3-0-3. Prerequisites: Math. 306 and consent of instructor.

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 proportional response; and instrument design. Specific instruments are considered as examples of general principles.


Mr. Patronis.
Graduate Courses Offered

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>Statistical Mechanics I</td>
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<tr>
<td>Phys. 621</td>
<td>Theoretical Mechanics</td>
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<td>Phys. 624</td>
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<td>Phys. 627</td>
<td>Introduction to Quantum Mechanics</td>
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<td>Phys. 628</td>
<td>Electromagnetic Theory I</td>
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<td>Phys. 630</td>
<td>Principles of Modern Physics I</td>
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<td>Phys. 631</td>
<td>Principles of Modern Physics II</td>
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<td>Physics of the Upper Atmosphere</td>
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<td>Phys. 676</td>
<td>Neutron and Reactor Physics</td>
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<td>Phys. 680</td>
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<td>Phys. 734</td>
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<td>Phys. 735</td>
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(Complete details about these courses are contained in the Graduate Bulletin, a copy of which is available upon request.)
School of Psychology

Director—Edward H. Loveland; Regents' Professor—Joseph E. Moore; Associate Professor—M. Carr Payne, Jr.; Assistant Professors—Richard P. Moll, C. Michael York; Lecturers—Earl A. Alluisi, Ethel Jo Baker; Secretary—Mrs. C. F. Chinkes.

General

The School of Psychology serves a dual function in the Institute. First, it offers courses which permit the student majoring in architecture, engineering, industrial management, and natural sciences to gain training in the basic and applied aspects of the science of behavior. Second, it offers a program of studies leading to the degree, Bachelor of Science in Applied Psychology. The general objective of all courses is to provide the student with an understanding of human behavior and its effects in personal, family, and industrial problems. The experimental approach, and the application of scientifically derived facts to the study and solution of human problems is emphasized.

The graduate of the curriculum in applied psychology will be well prepared to work in personnel and training departments in industry, and to serve with a human factors research team investigating human requirements in equipment design. He will be a psychology major trained in an engineering and technical institution. He will receive broad training in mathematics and the basic sciences, in addition to an organized program of courses in engineering, industrial management, the humanities, and social sciences. Junior and senior elective courses will be divided into two categories: those which the student may choose without restriction, and those which must be chosen from among a list of grouped engineering and management courses prescribed by the school of psychology. The student is encouraged to broaden his educational development by choosing at least a portion of his unrestricted elective courses from course offerings in the humanities and the social sciences.

The curriculum provides an excellent preparation for graduate study in psychology.

Freshman Year

<table>
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NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.
*For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
### Sophomore Year

<table>
<thead>
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<th>Course</th>
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Totals 17-8-18 17-8-18 17-11-19

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

### Junior Year

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<td>403</td>
<td>Introduction to Psychological Testing</td>
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<tr>
<td>Psych.</td>
<td>405</td>
<td>Psychological Aspects of Personnel Management</td>
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<td>Psych.</td>
<td>406</td>
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<td>Psych.</td>
<td>407</td>
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<tr>
<td>Psych.</td>
<td>410</td>
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<tr>
<td>Phys.</td>
<td>207</td>
<td>Mechanics</td>
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<td>Phys.</td>
<td>208</td>
<td>Electricity</td>
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<tr>
<td>Phys.</td>
<td>209</td>
<td>Heat, Sound, Light</td>
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Totals 17-3-18 17-3-18 15-9-18

### Senior Year

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<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
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<th>3rd Q.</th>
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<td>411</td>
<td>Experimental Psychology</td>
<td>3-3-4</td>
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<td>Psych.</td>
<td>412</td>
<td>Psychology of Learning</td>
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<td>413***</td>
<td>Applied Experimental Psychology</td>
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<td>3-3-4</td>
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<td>Psych.</td>
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<td>Special Problems</td>
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<td>315</td>
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<td>15-0-15</td>
<td>12-0-12</td>
<td>12-0-12</td>
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</table>

Totals 18-3-19 18-3-19 18-6-20

**A total of not more than 9 hours of electives may be in advanced ROTC.

***Psychology 602 may be substituted for Psychology 413 with the approval of the School of Psychology and the Dean of the Graduate School.
Courses of Instruction

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

Psy. 303. General Psychology A
3-0-3. Prerequisite: None.
This course is an intensive coverage of the methods and findings of contemporary psychology. Emphasis will be placed upon the scientific approach to the study of behavior and upon topics of maturation and development, learning, and motivation.
Staff.

Psy. 304. General Psychology B
3-0-3. Prerequisite: Psy. 303.
This is a continuation of Psychology 303. Such topics as individual differences, emotion, perception, and personality will be discussed.
Staff.

Psy. 400. Developmental Psychology
3-0-3. Prerequisite: Psy. 303.
A comprehensive study of the behavior and development of the child from infancy through adolescence. Emphasis will be given to the results of empirical research on experiences and processes which affect child behavior.
Mr. Moore.

Psy. 401. Industrial Psychology
3-0-3. Prerequisite: None.
This course introduces the student to scientific methods of inquiry as they are utilized in the study of human behavior in industry. Emphasis is on scientific and experimental study of individual differences, human relations, psychological aspects of equipment design, learning, and motivation.
Staff.

Psy. 402. Psychology of Adjustment
3-0-3. Prerequisite: Psy. 303.
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.
Mr. Moore, Mr. Moll.

Psy. 403. Introduction to Psychological Testing
3-0-3. Prerequisite: Psy. 401.
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.
Mr. Loveland.

Psy. 404. Psychology of Advertising
3-0-3. Prerequisites: Psy. 303 and 401.
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.
Mr. Payne.

Psy. 405. Psychological Aspects of Personnel Management
3-0-3. Prerequisite: Psy. 401.
The purpose of this course is to provide prospective business and industrial executives with a 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 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.

Mr. Loveland.

Psy. 406. Psychological Statistics
2-3-3. Prerequisite: Permission of the instructor.
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.

Mr. Loveland.

Psy. 407. Experimental Psychology I.
2-3-3. Prerequisite: Psy. 303.
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; sensorimotor coordination; and human feedback systems. Emphasis will be placed on the applications of the methods of science to the experimental study of human behavior.

Mr. Payne.

Psy. 410. Social Psychology
3-0-3. Prerequisite: Psy. 303.
The behavior of the individual in society is the main concern of this course. Emphasis will be placed on the scientific study of the individual in relation to other individuals and groups.

Mr. York.

Psy. 411. Experimental Psychology II
3-3-4. Prerequisites: Psy. 304 and 407, and permission of the instructor.
This course emphasizes quantitative methods in the scientific study of the learning process. Scientific methods of studying related topics such as motivation and thinking will also be treated.

Mr. Moll.

Psy. 412. Psychology of Learning
3-3-4. Prerequisites: Psy. 401 and 411, and permission of the instructor.
The purpose of this course is to familiarize the student with the basic phenomena of learning and to acquaint him with the pertinent contemporary literature. Applications of learning principles currently being made in business, industry, and other fields will be emphasized and the possibilities of additional future applications will be discussed.

Mr. Moll.

Psy. 413. Applied Experimental Psychology
3-3-4. Prerequisites: Psy. 406 and 412, and permission of the instructor.
Consideration of the applications of the methods and data of experimental psychology to practical behavior problems.

Mr. Loveland and Mr. Alluii.

Psy. 415. Special Problems
3-3-4. Prerequisite: Permission of instructor.
Students will work, under the direction of the instructor, on projects adding to their development beyond the scope of existing courses.

Staff.

Psy. 601. Advanced Industrial Psychology
3-0-3.

Psy. 602. Applied Experimental Psychology
3-0-3.

Psy. 603. Social Psychology
3-0-3.

Psy. 604. Human Information Processing
3-0-3.

Psy. 704. Special Problems in Industrial Psychology
Credit to be arranged.
Department of Social Sciences

Department Head—George Hendricks; Professors—Robert Scharf, Glenn N. Sisk; Associate Professors—Edward A. Gaston, John C. Gould, Malcolm G. Little, Willard E. Wight; Assistant Professors—Richard V. Allen, Charles B. Pyles; Instructors—John H. Burnett, Patrick Kelly, Val Mixon, Thomas D. Philips, Raymond D. Ricks, Mrs. Charlotte Tatro, Mrs. Sandra Thornton; Lecturer—Morris Mitzner; Secretary—Mrs. Agnes Doster.

General Information

The Department of Social Sciences gives Freshman courses describing contemporary society and the American government. To upperclassmen, it offers courses in sociology, history, government, philosophy and logic. Its courses in industrial sociology examine the community of the factory and the social roles of professional men, especially engineers. The department participates in the graduate City Planning program.

Freshmen are required to take either Social Sciences 111, 112 and 113, or Modern Languages. Transfer students may substitute for SS 111 and 112 any two of the following: SS 305, 306, 319, 327, 328.

Courses of Instruction

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

S.S. 111. Contemporary American Society
3-0-3. Prerequisite: None.
Description of contemporary society, with comparative and theoretical examination of developments in society.
Text: Selected paperback books on personality and culture. Staff.

S.S. 112. Contemporary American Society
3-0-3. Prerequisite: None.
Continuation of S.S. 111.
Text: Selected paperback books on contemporary institutions. Staff.

S.S. 113. Government of the United States
3-0-3. Prerequisite: None.
A study of the structure and functions of the United States and Georgia governments. IT GIVES EXEMPTION FROM THE UNITED STATES AND GEORGIA CONSTITUTION EXAMINATION.
Text: Saye, Pound, Allums, Principles of American Government; and selected paperback books on political institutions. Staff.

S.S. 208. Basic Sociology
3-0-3. Prerequisite: Sophomore standing.
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: Young, Sociology and Social Life. Mr. Gaston, Mrs. Tatro.

S.S. 301. Social Problems of Industry
3-0-3. Prerequisite: Junior standing or Sophomore with permission of instructor.
This course analyzes the factory, and the business enterprise as social institutions; with particular attention to the contrasting functions of formal and informal organization, and to the significance of co-operation, authority, communication, status and group norms in the work situation.
Text: Dubin, Human Relations in Administration. Mr. Mitzner.
S.S. 305. Nineteenth Century Europe  
3-0-3. Prerequisite: Sophomore, Junior or Senior standing.
Modern European History and its impact on world civilization.

S.S. 306. World Problems Since 1914  
3-0-3. Prerequisite: Sophomore, Junior or Senior standing.
A continuation of S.S. 305.

S.S. 307. American Economic History  
3-0-3. Prerequisite: Junior or Senior standing.
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: Robertson, *History of the American Economy*. Mr. Hendricks, Mr. Wight.

S.S. 313. The Problems of Public Opinion  
3-0-3. Prerequisite: Junior or Senior standing.
A study of the processes of opinion formation and opinion diffusion in large-scale urban societies. These processes will be examined with reference to situations in which the stimuli for opinion formation are produced (a) planfully, as by propaganda; or (b) without plan, as in the contexts of disaster or mass hysteria.
Text: To be selected.

S.S. 314. Individual and Society  
3-0-3. Prerequisite: Junior standing or Sophomore with permission of instructor.
A study of interpersonal relations in the small or informal group, seen in a variety of institutional contexts, such as the family, and in educational, military, or industrial organizations.

S.S. 319. History of the South  
3-0-3. Prerequisite: Junior or Senior standing.
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*.

S.S. 323. American Constitutional Problems  
3-0-3. Prerequisite: Junior or Senior standing.
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*.

S.S. 324. Georgia State and Local Problems  
3-0-3. Prerequisite: Junior or Senior standing.
Through the social, economic and political life of Georgia, the problems which have confronted the state are examined in their historical setting. The relating of Georgia's problems to the national scene gives the student a broader perspective of the state's place in the nation. Exemption from the *United States and Georgia history examination*.
Text: Coulter, *A Short History of Georgia*. Mr. Wight.

S.S. 325. American Diplomatic History  
3-0-3. Prerequisite: Junior or Senior standing.
An historical analysis of United States diplomacy from the Revolutionary War to the present. Emphasis is placed upon the political, economic, and social factors of American history influencing foreign policy and upon the role of the South in world affairs. Exemption from *United States and Georgia History Examination*. 
Text: Ferrell, American Diplomacy.  
Mr. Pyles.

S.S. 327. American Political and Social History to 1876  
3-0-3. Prerequisite: Junior or Senior standing.  
Readings on colonial America, the American Revolution, the framing of the Constitution, Jeffersonian democracy, sectionalism, the slavery question, succession, the Civil War, and Reconstruction. Attention is given to the place of Georgia in the history of the United States. Exemption from United States and Georgia history examination. 
Text: Faulkner, American Political and Social History.  
Mr. Wight.

S.S. 328. American Political and Social History Since 1876  
3-0-3. Prerequisite: Junior or Senior standing.  
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: Hicks, The American Nation: 1865 to Present.  
Mr. Sisk.

S.S. 331, 332. Introductory Philosophy  
3-0-3. Prerequisite: Junior or Senior standing.  
Ancient and modern systems of philosophy as related to political government, social ethics, economics, and comparative religion.  
S.S. 332 concentrates on deductive and inductive logic. 
Text for S.S. 331: Davidson, The Search for Meaning in Life.  
Mr. Scharf.

S.S. 334. Symbolic Logic  
3-0-3. Prerequisite: Junior or Senior standing.  
An approach to basic logical notions through use of special symbols. 
Text: Copi, Symbolic Logic.  
Mr. Kelly.

S.S. 347, 348. Foundations of National Power and International Relations  
3-0-3. Prerequisite: Junior or Senior standing.  
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 for S.S. 348: To be selected.  
Mr. Burnett.

S.S. 401. Municipal and County Government  
3-0-3. Prerequisite: Junior or Senior standing.  
An analysis of local government, with particular emphasis on the mechanics and functions of city and urban county governmental units. 
Text: To be selected.

S.S. 405, 406. Political Theory  
3-0-3. Prerequisite: Senior standing. Open to Graduate students.  
Beginning with the classical political thought of Plato and Aristotle, this course traces the development of political theory through the Middle Ages to the present. Special attention is given to the rise of ideology and the theories of Communism and Fascism. 
Text: To be selected. Mrs. Thornton.

S.S. 412. Technology and Society  
3-0-3. Prerequisite: Senior or Graduate standing. Open to Graduate students.  
This course analyzes the social conditions which promote or retard technological activity. Particular emphasis is placed on the historical development of technology in Western Society, and on the social role of the scientific and engineering professions in that development. 
Mr. Mitzner.
S.S. 415. Urban Sociology
3-0-3. Prerequisite: Senior or Graduate standing. Open to Graduate students.

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.

Graduate Courses Offered

<table>
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<tr>
<th>S.S.</th>
<th>Course Title</th>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>601</td>
<td>Governmental Aspects of Planning</td>
<td>3-0-3</td>
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<tr>
<td>605</td>
<td>Planning for People</td>
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</table>
The A. French Textile School
(Established in 1899)

Director—James L. Taylor; Professors—Herman A. Dickert, Ralph L. Hill, R. K. Flege, Charles A. Jones (Emeritus); Associate Professors—Gerald B. Fletcher, J. Weldon McCarty, John I. Alford; Assistant Professor—Ralph C. Latham; Secretary—Mrs. Muriel Kunda; Building Engineer—H. G. Adams.

General

This school, housed in the modern Harrison Hightower Building, offers courses leading to the degrees of Bachelor of Textile Engineering, Bachelor of Science in Textile Chemistry and Bachelor of Science in Textiles. 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 degrees 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 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.

Program for B. of Textile Engineering Degree

Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>No.</th>
<th>Subject</th>
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<td>Chem.</td>
<td>101-2-3</td>
<td>General Chemistry</td>
<td>3-3-4</td>
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<td>Draw.</td>
<td>113-14-15</td>
<td>Engineering Graphics</td>
<td>0-6-2</td>
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<td>Eng.</td>
<td>101-2</td>
<td>Composition and Rhetoric</td>
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<td>Eng.</td>
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<td>Introduction to Literature</td>
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<td>Math.</td>
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<td>Algebra and Trigonometry</td>
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<td>Math.</td>
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<td>S.S.</td>
<td>111-12-13</td>
<td>Social Science</td>
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<td>P.T.</td>
<td>101-2-3</td>
<td>Physical Training</td>
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<td>3-1-2</td>
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<tr>
<td>Gen.</td>
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<td>Orientation</td>
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<td>18-14-20</td>
<td>17-14-20</td>
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NOTE: Under Quarters, 3-3-4 means 3 hours class, 3 hours lab., 4 hours credit.

*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.
**For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.
### Sophomore Year

<table>
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<td>Eng.</td>
<td>201-2-3 Survey of the Humanities</td>
<td>3-0-3</td>
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<td>Math.</td>
<td>202-3 Calculus</td>
<td>5-0-5</td>
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<td>Math.</td>
<td>304 Differential Equations</td>
<td>5-3-6</td>
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<td>5-3-6</td>
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<td>Physics</td>
<td>207-8-9 Physics</td>
<td>3-0-3</td>
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<tr>
<td>Mech.</td>
<td>321 Textile Design</td>
<td>3-0-3</td>
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<tr>
<td>I.M.</td>
<td>204 Survey of Economics</td>
<td>3-0-3</td>
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<tr>
<td>Mech.</td>
<td>305 Statics</td>
<td>3-0-3</td>
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<td>P.T.</td>
<td>201-2-3 Physical Training</td>
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Totals 19-8-20 19-8-20 19-8-20

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

### Junior Year

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<td>325 Electrical Circuits and Fields</td>
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<tr>
<td>E.E.</td>
<td>326 or Elementary Electronics</td>
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<tr>
<td>E.E.</td>
<td>327 Electric Power Conversion</td>
<td>5-0-5</td>
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<tr>
<td>Mech.</td>
<td>308 Dynamics</td>
<td>5-0-5</td>
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<tr>
<td>Mech.</td>
<td>334, 337 Mechanics of Materials</td>
<td>4-0-4</td>
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<tr>
<td>M.E.</td>
<td>320 Thermodynamics</td>
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<td>Tex.</td>
<td>240-2-3 Yarn Manufacturing</td>
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<td>Tex.</td>
<td>328-9 Weaving</td>
<td>3-3-4</td>
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<td>Tex.</td>
<td>352 Physical Textile Testing</td>
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<tr>
<td>Eng.</td>
<td>320 Technical Writing</td>
<td>3-0-3</td>
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Totals 16-9-19 16-9-19 15-6-17

### Senior Year

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Totals 16-6-18 13-12-17 14-12-18

*S.S. 319, 325 and 327 may be substituted for S.S. 328.

**Not more than 9 hours of electives may be in Advanced ROTC.
# Program for B.S. in Textile Chemistry

## Freshman Year

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

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

**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.

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

## Sophomore Year

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*For course numbers, see the course descriptions under the appropriate ROTC Sections of this Bulletin.
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**Totals**: 15-12-19 15-9-18 15-9-18

### Senior Year

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**Totals**: 15-9-18 14-9-17 14-12-18

**Six hours of electives must be taken in humanities from list on page 34. Not more than nine hours of electives may be in advanced ROTC.**
# Program for B.S. in Textiles

## Freshman Year

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**Totals** 18-8-18 17-14-20 17-14-20

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

*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.

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

## Sophomore Year

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**Totals** 16-8-17 19-8-20 19-8-20

*For course numbers, see the course descriptions under the appropriate ROTC sections of this Bulletin.*
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### Senior Year

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<td>440</td>
<td>Synthetic Fibers</td>
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<td>442</td>
<td>Introduction to Textile Chem.</td>
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<td>444</td>
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<td>Textile Costing</td>
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**Not more than 9 hours of electives may be in Advanced ROTC.**

### 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.

Gives students 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. (Not open to Textile students.)

Text: To be selected.

Mr. Dickert, Mr. Alford.

**Tex. 202. Fiber Processing**

3-0-3. Prerequisite: None.

A survey course in Yarn Manufacturing covering the theory and principles of processing natural and synthetic fibers on the cotton, woolen
and American worsted systems. (Not open to Textile Students.)

Text: To be selected.

Mr. Alford, Mr. Latham.

**Tex. 231, 232. Textile Design**
3-0-3. Prerequisite: None.
Consent of instructor for non-textile students.

The first course covers the study of the fundamental weaves, their structures, properties and applications to various types of fabrics. The second course covers the more complex dobby patterns including honeycombs, brighton, diamond, huck, and the multiple warp and/or filling fabrics such as backed, figured, double and triple cloths.

Text: Vol. 8, ITC, Design and Analysis.

Mr. Fletcher, Mr. McCarty.

**Tex. 240. Yarn Manufacturing**
3-3-4. Prerequisite: None.

The first in a series of courses designed to give the student the fundamental theory and practice in yarn manufacturing. This course covers the process from opening through carding on both natural and man-made fibers.

Text: Vol. 1, ITC, Yarn Manufacturing.

Mr. Hill, Mr. Latham.

**Tex. 242, 243, 308. Yarn Manufacturing**
3-3-4. Prerequisite: Tex. 240.

A continuation of Tex. 240 covering drawing, roving, spinning, twisting winding and warping. Goes further into detail on machine construction, theory of processing and methods of process control. Covers practical machine operation and textile calculations on both convention and long draft equipment.

Texts: Vols. 2 and 3 ITC, Yarn Manufacturing; Vols. 1 and 2 Parker, Cotton Mill Machinery Calculations.

Mr. Hill, Mr. Latham.

**Tex. 251. Survey of Fabric Production**
3-0-3. Prerequisite: None.

A survey course in the design, weaving and utilization of fabrics made from both natural and synthetic fibers. The production of knitted and non-woven fabrics and the uses for these materials are also covered. (Not open to Textile Students.)

Text: To be selected.

**Tex. 252. Survey of Dyeing and Finishing of Textile Materials**
3-0-3. Prerequisite: None.

A survey course covering the dyeing and finishing of textile materials made from both natural and synthetic fibers. Classes of dyes and the methods of application to the different types of fibers are covered as are some of the more common methods of finishing which are used to enhance the saleability of the textile product. (Not open to Textile Students.)

Text: To be selected.

**Tex. 254. Applied Design**
3-0-3. Prerequisite: Tex. 231.

Course covers a study of design and mechanical aspects of textile design. Classes of dyes and the methods of application to the different types of fibers are covered as are some of the more common methods of finishing which are used to enhance the saleability of the textile product. (Not open to Textile Students.)

Text: To be selected.

**Tex. 255. Survey of Fabric Production**
3-0-3. Prerequisite: Tex. 231.

A survey course in the design, weaving and utilization of fabrics made from both natural and synthetic fibers. The production of knitted and non-woven fabrics and the uses for these materials are also covered. (Not open to Textile Students.)

Text: To be selected.

**Tex. 256. Survey of Dyeing and Finishing of Textile Materials**
3-0-3. Prerequisite: None.

A survey course covering the dyeing and finishing of textile materials made from both natural and synthetic fibers. Classes of dyes and the methods of application to the different types of fibers are covered as are some of the more common methods of finishing which are used to enhance the saleability of the textile product. (Not open to Textile Students.)

Text: To be selected.

**Tex. 314. Fabric Analysis**
2-3-3. Prerequisite: Tex. 231.

Course covers a study of yarn and cloth calculations and fabric analysis.

Text: Vol. 8, ITC, Design and Analysis.

Mr. Fletcher, Mr. McCarty.

**Tex. 328, 329. Weaving**
3-3-4. Prerequisite: None.

Courses covering theory and practice of weaving with cam, dobby and box looms. A detailed study is made of loom mechanism, nomenclature, and automatic attachments.

Texts: ITC, Vol. 5 and Vol. 6, Weaving.

Mr. Fletcher, Mr. Alford.

**Tex. 330. Weaving**
3-0-3. Prerequisite: Tex. 329.

A continuation of Tex. 329 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. Also covers cloth room machinery and dry finishing operations.


Mr. Fletcher, Mr. Alford.
Tex. 352. Physical Textile Testing
2-3-3. Prerequisite: Junior standing.
A course covering the methods and techniques of testing yarns and fabrics made from natural and synthetic fibers. Standard A.S.T.M. method and practices for the testing of textile materials are followed and a study is made of the various machines and apparatus employed in standard testing laboratories.
Mr. McCarty.

Tex. 420. Standard Fabrics
3-0-3. Prerequisite: Senior standing.
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.
Staff.

Tex. 421. The Engineering of Textile Structures
2-3-3. Prerequisite: Senior standing in Textile Engineering.
This course covers the application of engineering principles to the processing and design of textile materials. Basic fiber properties and translation characteristics are studied along with end-use requirements in an endeavor to produce a desired textile structure. Stress-strain analysis, friction characteristics, yarn evenness and thermal transmission properties are among the topics of discussion.
Text: To be selected.
Mr. Flege.

Tex. 422. Jacquard Design and Weaving
2-3-3. Prerequisites: Tex. 232 and 329.
A course covering the designing of Jacquard patterns and the techniques involved in the transfer of design to the loom. Various methods for the production of special figuring effects are covered. The details of the Jacquard head and the mechanisms by which the head is driven from the regular looms are studied.
Text: To be selected.
Mr. Fletcher, Mr. McCarty.

Tex. 423. Fiber Technology
2-3-3. Prerequisite: Senior Textile standing.
A course covering the technology of fiber testing techniques. Includes a brief study of cotton classing, textile microscopy, the Micronaire, the Fibrograph, fiber arrays, fiber strength studies and other fiber tests.
Text: Heyn, Fiber Microscopy.
Mr. McCarty, Mr. Dickert.

Tex. 437. Chemical Textile Testing
2-3-3. Prerequisites: Tex. 352 and Tex. 444.
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.
Mr. Dickert.

Tex. 440. Synthetic Fibers
3-0-3. Prerequisites: Senior Textile standing or Tex. 243.
Course is designed to give student necessary background for handling synthetic fibers. Covers basic chemistry of manufacturing synthetic fibers by all major processes and also covers the fundamentals of processing synthetics on the silk system as well as processing staple fiber on the cotton, wool and worsted systems.
Text: Moncrieff, Man-made Fibers.
Mr. Dickert, Mr. Taylor.

Tex. 442. Introduction to Textile Chemistry
3-0-3. Prerequisite: Chem. 305.
A general course covering basic methods of bleaching and dyeing. Covers theory and practice.
Text: To be selected.
Mr. Taylor.

Tex. 444. Dyeing and Finishing of Natural Fibers
3-3-4. Prerequisite: Tex. 442.
A continuation of Tex. 442 going more into the technique of handling fabrics from natural fibers. Covers dye selection, finishing procedure, etc.

Text: Cockett and Hilton, *Dyeing of Cellulosic Fibers.* Mr. Flege.

**Tex. 446. Dyeing and Finishing Synthetics**

3-3-4. Prerequisite: Tex. 444.

Course covers technique of handling fabrics made from synthetic fibers. It covers the handling of fabrics, dye selection, finishing procedures, etc.

Text: Cockett and Hilton, *Dyeing of Cellulosic Fibers.* Mr. Flege.

**Tex. 447. Textile Costing**

3-0-3. Prerequisites: Tex. 329 and Tex. 243.

Covers basic principles, material, labor, overhead, departmentalizing, accumulating costs by departments, allocation of costs, predetermined costs, fabric cost sheet, marketing cost and financial statements.

Text: Lockwood and Maxwell, *Textile Costing.* Mr. McCarty, Mr. Lathem.

**Tex. 449. Textile Costing**

3-0-3. Prerequisite: Tex. 447.

This is a more advanced course designed to give the Manufacturing Option student additional work with reference to costs in Textile Mills. Texts: Campbell, *Typical Cost System for Grey Goods Mill;* Campbell, *Student Work Book.*

Mr. McCarty, Mr. Hill.

**Tex. 450. Calculations and Mechanics of Textile Machines**

3-0-3. Prerequisite: Tex. 243.

This course supplies the Textile Engineering student with a concentrated course of calculations dealing with machine operations, process control, mill organization and mechanics of textile machines.

Text: Lecture notes. Mr. Hill.

**Tex. 451. Mill Engineering**

3-0-3. Prerequisite: Tex. 308.

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: Lecture notes.

Mr. Hill, Mr. Dickert.

**Tex. 453. Textile Plant Design**

2-3-3. Prerequisites: Tex. 450 and E.E. 325.

This course acquaints the students with the selection and cost of process equipment, organization programs, plant layouts and the proper equipment for air-conditioning, lighting, power and material handling. Current design methods are discussed, evaluated and utilized.

Text: Lecture notes.

Mr. Hill and Mr. Dickert.

**Tex. 454. Seminar**

1-0-1. Prerequisite: Senior standing.

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.

Staff.

**Tex. 455. Textile Engineering Problems**

1-6-3. Prerequisite: Senior standing in Textile Engineering.

Special problems involving analytical or experimental investigations in the field of Textile Engineering designed to develop the student's initiative.

Text: None. Staff.

**Tex. 456. Special Problems in Textiles**

1-6-3. Prerequisites: Senior standing in Textile Chemistry or B.S. in Textiles.

Special problems involving analytical or experimental investigations in the field of textiles and/or textile chemistry. Designed to develop the students' initiative.

Text: None. Staff.

**Tex. 459. Textile Printing**

2-3-3. Prerequisite: Tex. 444.

A survey course in printing 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: To be selected.

Mr. Taylor, Mr. Flege.

**Tex. 461. Chemical Treatments for Textiles**

3-0-3. Prerequisite: Tex. 444.
Course covers chemistry of specialized finishing treatments for textiles.

Text: Speel, *Textile Chemicals and Auxiliaries*.
Mr. Flege and Mr. Taylor.

**Tex. 462. Problems in Dyeing and Finishing Plants**

3-3-4. Prerequisite: Ch.E. 350.
This course covers the application of engineering principles and operations to dyeing and finishing of yarns and fabrics made from natural and synthetic fibers.
Text: Lecture Notes. Mr. Flege.

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 ............................................. 3-3-4
Tex. 701, 2, 3 Seminar .................................................. 1-0-0
Tex. 704, 705, 706. Special problems and topics in Textiles and Textile Engineering. Credit to be arranged. Grad. Staff.

(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. Co-operative students complete twelve academic quarters and their scheduled industrial quarters. The alternation between campus and industry continues until the student has completed the second or third quarter (depending on the student's section) of the junior year curriculum, at which time the students are scheduled to attend classes continuously until graduation.

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 at some other accredited institution of higher learning. The entrance requirements for the Co-operative Courses include all “Specified or Required Units” on page 18. 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 school 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 twenty firms, including power companies, electric and electronic equipment manufacturers, oil companies, airlines, 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 federal 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 $275.00 per month. The wages increase as the 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 $900.00 and an out-of-state student about $1,175.00 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 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 GRADUATE DIVISION

(A Bulletin on Graduate Studies will be sent upon request)

Administrative Officers

Mario J. Goglia, Ph.D. ..................................................... Dean
Karl M. Murphy, Ph.D. ..................................................... Assistant

Graduate Council

Mario J. Goglia, 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
Wyatt C. Whitley, Ph.D. .................................................. Director, Engineering Experiment Station

Mrs. J. H. Crosland .......................................................... Director, Libraries

Appointment Expiring June 30, 1963:
Jack Hine, Ph.D., Regents' Professor of Chemistry
Harold E. Smalley, Ph.D., Professor of Industrial Engineering
Bertram M. Drucker, Ph.D., Director, School of Mathematics

Appointment Expiring June 30, 1964:
Vernon Crawford, Ph.D., Associate Director, School of Physics
James L. Taylor, Ph.D., Director of the School of Textile Engineering
James D. Wright, Ph.D., Head, Department of Modern Languages

Appointment Expiring June 30, 1965:
William B. Jones, Jr., Ph.D., Professor of Electrical Engineering
Kenneth G. Picha, Ph.D., Director, School of Mechanical Engineering
Homer V. Grubb, Ph.D., Director of the School of Chemical Engineering

Appointment Expiring June 30, 1966:
Donald W. Dutton, M.S., Director, School of Aerospace Engineering
Sherman F. Dallas, Ph.D., Professor, Industrial Management
Frederick W. Schutz, Jr., Ph.D., Director, School of Civil Engineering

Degrees and Fields of Study

The degree of Master of Science is offered with or without designation in the following fields: Aerospace Engineering, Applied Mathematics, Ceramic Engineering, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, Engineering Mechanics, Industrial Engineering, Industrial Management, Mechanical Engineering, Metallurgy, Nuclear Engineering, Nuclear Science, 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 Aerospace Engineering, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Physics, and Sanitary Engineering.

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

A-C Network Calculator
Graduate Study and Research in Electrical Engineering

Atlantic Steel Company
Graduate Study in Metallurgy

Automotive Safety Foundation
Graduate Study and Research in Highway Engineering and Civil Engineering

Callaway Foundation
Graduate Study and Research in Industrial, Mechanical, Electrical, Chemical, or Textile Engineering

Celanese Corporation
Graduate Study in Textiles and Textile Engineering

Dow Chemical Company
Graduate Study and Research in Chemical Field

Eastman Kodak
Graduate Study and Research in Chemistry

Ethyl Corporation
Graduate Study and Research in Chemical Engineering

Guggenheim Fellowship
Graduate Fellowship in Aerospace Engineering

Humble Oil Company
Graduate Study in Chemical Engineering

Kaiser Aluminum and Chemical Corporation
Graduate Study and Research in Chemical Engineering

Mary White Staton Program
Graduate Study and Research for a Graduate Student from Colombia, South America

Rayonier Corporation
Graduate Study and Research in Chemistry or Chemical Engineering

L. W. Robert & Company
Graduate Study in Architecture and Engineering

Schlumberger Foundation
Graduate Study and Research in Mechanical Engineering

Sears Roebuck Fellowship
Graduate Fellowship in City Planning

Shell Oil Company
Graduate Study and Research in Chemical Engineering and in Civil Engineering

T. E. Stribling Foundation
Graduate Study and Research in Textile Engineering

U. S. Rubber Company Foundation
Graduate Study and Research in Physics and Engineering

United States Steel Foundation
Graduate Study and Research in the Solid State Field

For further information concerning any of the fellowships, write the Dean of the Graduate Division.
Graduate Fellowships

Fellowships may be made available through grants to the Institute from the Ford Foundation, National Aeronautics and Space Administration, National Science Foundation, National Institutes of Health, Research Corporation, the Atomic Energy Commission, and the National Defense Education Program.

Instructors and Assistants

A number of part-time instructorships and teaching or research assistantships are available for qualified graduate students through the Schools, Departments, and the Engineering Experiment Station. These appointments are normally for one-third full time and carry stipends ranging from $1,500 upward for the academic year.

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-three 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 dissertation. 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 courses available in the various departments, may be obtained on request from the Dean of the Graduate Division.
ENGINEERING EXPERIMENT STATION

Directional Staff


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, chemical and biological 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 technological institution should carry on, conjointly, a strong educational program and a coordinated fundamental and applied research program. Teaching and research are complementary. At Georgia Tech, this philosophy is carried out by a full-time Engineering Experiment Station staff comprised of competent engineers, scientists, technicians, a large number of associated faculty members, and a strong supporting Graduate Division.

During the year, 1961-62, the Station utilized the full-time services of an average of 313 persons and part-time services of an average of 329 persons in the prosecution of 357 research projects. Included in this personnel total were 109 instructional department faculty members, 65 graduate students, and 86 undergraduate students.
Many research activities of great potential value to the State and the South are now underway. Some of these studies concern: the development of Georgia's industrial economy; the industrial uses of radioisotopes; new processes and uses of Georgia's ceramic clays and other minerals; nuclear reactor engineering; applications of nuclear physics and chemistry to the health sciences; factors affecting the aerial transmission of disease; applications and development of electronic computers; new methods of electrical power system analysis; the effects of river impoundments on water quality; meat-separation processes for chicken industry; and protective treatments for cotton textiles.

A number of projects also concern the basic nature of matter and energy. Among these are studies in nuclear physics, microwave radar, organic chemistry, semi-conductors, microbiology, and mathematical statistics.

The results of most of these investigations are made available to the public by publication in technical periodicals, in the bulletins, reprints, and special reports of the Station, and in Georgia Tech's regular journal, The Research Engineer.

The Station's budget for 1962-63 was approximately $4,500,000. 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 contracts 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.

Research Staff

Station faculty members and professional staff are listed among the General Faculty beginning on page 246.
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, two-year college level 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.

The Engineering Extension Division consists of four units—the Engineering Evening School, Short Courses and Conferences, Industrial Education, and Southern Technical Institute.

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. All fees are subject to change without notice.

Part-Time Schedules

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Full-Time Schedules

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<th></th>
<th>Matriculation</th>
<th>Tuition</th>
<th>Medical</th>
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<tr>
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</tbody>
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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 Institute 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**

The Engineering Technician is the newest member of the Engineering Team. This team is composed of the scientist, the engineer, the engineering technician and the craftsman. His addition to the team resulted from what may be called the impatience of the 20th century. Prior to World War II the lapse time between a scientific discovery and its application was of the order of 6 to 10 years. Today our technology is moving so fast that this time is now of the order of 3 to 6 months or less.

This increasing pressure to move more quickly from experiment to product requires engineers to witness, interpret and make use of scientific discoveries almost as they occur. This change in engineer's work requires engineering education to be more and more in the area of advanced mathematics and the physical sciences, and less and less in applied or operational engineering fields. Today an engineer's work is generally concerned with development and design rather than with applied or operational engineering work.

Because the engineering arts and skills are essential to industry, The American Society of Engineering Education has sponsored the Technical-Institute Program with curricula designed to fill the educational gap caused by the change in the engineer's work and to train men qualified to take over much of the operational engineering work formerly done by large segments of the engineering profession, thus freeing engineers for engineering work requiring a much more scientific and mathematical background.

The engineering technician is concerned with the production and operational aspects of engineering and industry, and he performs specific tasks which are functional parts of the engineering or scientific activities.

Such work usually embraces a specialized field of research, design, development, or construction; or of control and operation of production facilities and manpower.

Graduates from Technical Institute courses are in great demand. 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 the new Southern Technical Institute campus at Marietta, 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.

This training is also available on a part-time schedule in the Engineering Evening School on both the Georgia Tech and the Southern Tech campus. Approximately five 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, Trigonometry, Elementary Physics, and Chemistry.

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.

INDUSTRIAL EDUCATION
In conformity with the provisions of the various vocational education acts, this department, in cooperation with the State Department of Education, has a responsibility for training industrial, fire service, and related technical teachers for the following:

1. Evening and part-time classes in public schools and industrial and fire service organizations.
2. All day public trade schools.
3. Supervision courses.

The activities of the department include research to determine specific industrial and fire service education needs of a community, industry or plant; developing courses of study to meet these needs; selecting teachers of the required occupational experience; training these teachers for specialized service; developing specialized instructional materials for use of such teachers; training local teacher trainers in the larger centers; and improving 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 Department of Education, local boards of education, and industrial and fire service organizations. The following courses and other activities are conducted at many localities in the state: principles and organization of industrial education, conference leading, methods of teaching, industrial education psychology, course planning, practice teaching, industrial plant surveys, teaching related subjects, and occupational analysis.

The Georgia Fire Institute
The Georgia Fire Institute was established in the Industrial Education Department in 1958 by the Board of Regents through a special appropriation by the State. It is a coordination of both the Georgia Institute of Technology and the State Department of Education, cooperating with local boards of education and fire departments, for amplifying the program of fire service training that has been in development for many years by these agencies. Its aim is the
optimum training of Georgia firemen, paid and volunteer, public and private, to reduce and hold to the minimum Georgia's loss of life and property by fire.

Throughout the State the Fire Institute conducts short and long-time classes in local fire departments, short intensive zone fire schools in the special fire service problems of various sections of the State, and short intensive statewide fire schools. In the latter it is successor to the former Georgia State Fire College. The training includes the techniques and technologies of fire prevention, inspection, extinguishment, rescue, and investigation, and fire department officership and administration.

The faculty consists of a Head, twenty-one part-time coordinator-instructors each of whom is regularly employed as an officer of a leading fire department in each area of the State, and many part-time local instructors similarly employed.

**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
Marietta, Georgia


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 him 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 curricula are designed to provide the basic scientific training, the specialized technical "know-how," and the supervisory and management training needed by the engineering 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

Applicants must be high school graduates or equivalent and must have two credits in algebra, one credit in geometry, two credits in science, and four credits in English. Applicants must have also taken the College Entrance Examination Board Scholastic Aptitude Tests (Verbal and Mathematical).

For those students lacking one or more of these entrance credits or wishing to strengthen their preparation for college work, Southern Tech offers pre-freshman courses in algebra and geometry, and English.

*On Leave
Veteran's Program

Veterans are eligible to enter the Institute under the G.I. Bill of Rights, as established under Public Laws 550, 894, and 634.

Tuition and Fees

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

<table>
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<tr>
<th>Matriculation Fee per Quarter</th>
<th>Tuition Fee per Quarter</th>
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Courses of Study

Courses are offered in Building Construction Technology, and in Air Conditioning Engineering Technology, Civil Engineering Technology, Electrical Engineering Technology (Electronics Option), Electrical Engineering Technology (Power Option), Electrical Engineering Technology (Telephone Option), Gas Engineering Technology, Industrial Engineering Technology, Industrial Engineering Technology (Management Option), Mechanical Engineering Technology, and Textile Engineering Technology.

The job opportunities for engineering technicians are numerous. Studies made by the American Society of Engineering Education reveal that two engineering 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 engineering technicians, at salaries ranging upward from $4,500 per year.

The work offered qualifies the engineering technician graduate for a rapidly expanding number of technical jobs in applied engineering. His work is closely related to that of the graduate engineer and, in fact, the two commonly work as a team.

A special bulletin containing complete information will be sent upon request. Direct such requests to Registrar, Southern Tech, Marietta, Ga.
STUDENT HEALTH SERVICE

The Health Service is located in the Joseph Brown Whitehead Memorial Hospital located on Fifth Street adjoining Rose Bowl Field. The hospital contains the offices of the medical staff, examination and treatment rooms, clinical laboratory, X-ray and physiotherapy departments, plus wards and rooms for seventy patients. Food for patients is normally obtained from the college dining hall but special diets are prepared in the hospital.

The Infirmary staff consists of two full-time physicians, three regularly visiting consultants in Internal Medicine and Psychiatry, four young doctors from Emory University, eight registered nurses, one laboratory technician, one physical therapist and one X-ray technician, two secretaries, three orderlies and three maids. We also have thirty physicians, representing the various medical specialties, on our consulting staff who are available when their services are needed.

Infirmary policy is determined by a faculty committee composed of the Dean of Students, the Assistant Athletic Director, the Dean of Faculties, the Athletic Association physician, and the Director of Health.

The facilities of the Health Service are available to all day school students and all night school students who take twelve or more credit hours of classes. The Health Service is financed by student fees and only those who have paid a health fee for the current quarter are eligible for treatment. Co-op students on their work quarter and night school students with less than 12 credit hours are not charged a health fee and are not entitled to any treatment at the Infirmary. Faculty members and Institute employees are entitled only to emergency first aid treatment.

For those eligible, the Health Service provides unlimited free office treatment. This includes necessary medical care and such minor surgery as deemed necessary and provided by the school physicians. If the illness or injury is of such complexity or severity that a consultation with a specialist is deemed necessary, this will be arranged by the Health Service at school expense. Up to 14 days hospitalization in the school Infirmary each quarter with necessary nursing care, drugs, laboratory and X-ray service is provided free of charge except for a charge of one dollar for each meal served. If the illness or injury requires treatment in a private hospital, arrangements will be made by the Director of Health for such care and the Health Service will help pay such expenses.

All students who are sick or injured are expected to report to the Infirmary for treatment. If the student does not desire treatment by one of the school employed physicians, he may arrange for another physician to care for him at the Infirmary. The Health Service will not be responsible for any charges made by private physicians or private hospitals unless the student was referred by one of the school employed physicians and the charges authorized in writing prior to such visit.

In the case of serious injury from an auto accident, telephone approval may be obtained from the physician on duty at the Infirmary. Medical care is available at the Infirmary 24 hours a day when school is in session but not at all on authorized vacation periods or between quarters. Physicians are on duty for regular clinic visits from 7:45 a.m. to 11:30 a.m. and from 1:00 p.m. to 5:00 p.m. Monday through Friday and from 7:45 a.m. to 1:00 p.m. on Saturdays. The period from 11:30 a.m. to 1:00 p.m. is reserved for the treatment of athletic association students, for consultations by the visiting specialist with pre-selected patients and for staff lunches.
Emergency visits are possible at any hour of the day or night. An emergency is an illness or injury that is likely to become worse if treatment is delayed until the next regularly scheduled clinic period—it has nothing to do with class schedule or convenience of the patient. Students are expected to make their clinic visits during their free periods or before classes begin in the morning if they have no free time. Classes will be excused for the actual time of visit to the physician if the visit is an emergency or the student has no free time during clinic hours.

School regulations prohibit any student staying in his room in a dormitory or fraternity house with a contagious disease. If the school physicians feel that the illness of the student is contagious or is severe enough to justify absence from classes, the student will be put to bed in the Infirmary until such time as he is able to return to classes with safety. School regulations require a class excuse for any absence caused by illness. To be eligible for such an excuse, the student must be confined to the Infirmary or another hospital. The only exception made is in the case of local students who reside in the home with their parents, who may bring in a note from a parent concerning the illness and be given an excuse for one day’s classes. If the absence is for more than one day, the student must have a physician’s certificate stating the cause for the absence and the period he advised the student to remain at home. The Health Service does not provide any care for students in the home nor do the physicians make house calls.

Only physical training classes will be excused for patients not actually confined to bed and these excuses must be obtained from the Infirmary prior to the hour of the scheduled class. Class excuses for patients confined to bed will be issued only for the actual period of confinement to bed. If a student is unable to drill, the physician will give the student a chit authorizing other duties to be assigned by the military for the hour.

The Health Service does not have or provide any insurance. Free service is limited to care in the Infirmary, and for injuries received in class. Free service does not apply to elective surgery, specialist treatment, orthopedic appliances, special nurses, or hospitalization. The Health Service will assume no financial responsibility for the treatment of chronic diseases or injury present prior to enrollment, nor will it be responsible for elective surgery such as wart removal, hernia repair, tonsillectomy, pilonidal cyst removal, etc. The Health Service provides no dental care except for the repair of teeth injured in P.T. class, provided such injury is reported within one hour of the injury. It does not pay for eye refraction or for glasses.

Only if glasses are broken in P.T. class while wearing protective goggles, will the glasses be replaced by the Health Service. All students who must wear glasses should keep an extra pair on hand and a copy of their prescription for glasses. If a student has appendicitis or some other condition for which emergency surgery is deemed necessary, the Health Service will pay up to $200 towards the surgeons fee and $10 per day plus $100 toward the hospital bill, up to a maximum of 14 days in any one quarter. The parents are responsible for the remainder of the bill. The Health Service will assume this financial responsibility only if such service is deemed necessary and authorized in advance by the Health Service. The Health Service will assume no responsibility for any injury received either in flying or parachuting or skin diving.

All students are required to have immunization against tetanus (toxoid), small pox, and at least 2 doses of Salk Polio Vaccine prior to enrollment. The third polio shot and boosters for tetanus and small pox will be given as needed.
Tech does not require typhoid vaccine but advises it for those who intend to do water skiing, skin diving, or other fresh water sports.

Entrance physical examination forms are mailed to students with the notice of their acceptance for enrollment. These forms are to be completed by the prospective student and his personal physician and mailed to the Director of Health in sufficient time to be received prior to the date of initial registration. After review of the medical history and physical examination report, the school physicians determine the assignments to R.O.T.C. and Physical Training. Any student who desires special consideration because of mental or physical disability should have his physician write an explanatory letter to the Director of Health giving full details of the disability and any desired limitations on physical activity. This letter is to be attached to the physical examination form. Any special examinations or reports needed to determine eligibility for enrollment or assignment are at the expense of the student, not the school. Any student who fails to submit the required physical examination and immunization record prior to registration will have the examination ordered by the school at the expense of the student.

The Director of Health as representative of the Institute reserves the right to exclude students with certain infirmities or disabilities which he feels may be detrimental either to the individual or to other students. He also reserves the right to require certain treatment of students in order to qualify for enrollment or to remain in school.
On November 21, 1953, the new Price Gilbert Memorial 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 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 has a capacity of about 450,000 volumes and will seat 800. The General Studies Library is on the first and second floors and the Science-Technology Library on the third and fourth floors. The Music Room on the ground floor contains more than 6,000 recordings, a collection which continues to grow because of the generous gifts of alumni. The Music Room offers much enjoyment to both students and faculty. When the folding partition between them is opened, the Music Room and Wilby Room together can serve as an auditorium seating almost 300.

The Library collection today numbers more than 270,000 volumes and approximately 125,000 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 catalog for all books and periodicals.

In August 1962 the Tech Library was designated as one of twelve Regional Technical Report Centers, where unclassified U.S. Government Scientific Technical Reports are deposited to serve users in Alabama, Florida, Georgia,
Mississippi, South Carolina, Tennessee, and Puerto Rico. To expedite service
the Center has a TWX system, three Xerox 914 copying machines, and a Ther-
mo-Fax Reader Printer for microfilm.

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 11:30 p.m. Monday through Friday. On Saturday the
building closes at 6:00 p.m. It is open on Sundays from 2:00 p.m. to 10:00
p.m. Printed Library regulations are given the freshmen at the time of
matriculation.
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 the office. Counseling assistance on personal, vocational, financial, and other problems are provided.

A program of counseling and guidance is provided by the Office of the Dean of Students. The Guidance and Counseling Service is staffed by professionally trained counselors. The main concern of this office is to provide counseling for those Georgia Tech students and alumni who are concerned with questions about their academic adjustment, vocational choice, and personal adjustment. Frequently, in conjunction with counseling, various psychological tests are recommended by the counselor to assist the student in the assessment of his abilities, interests, personality, and achievements. In the main, the Guidance and Counseling Service counsels with normal students who have normal problems and prefers to counsel with those students who choose to come voluntarily for those services offered by this office.

The Counselor's Guide to Georgia Colleges, published by the Office of Testing and Guidance, the Regents, University System of Georgia, contains the most accurate possible estimates of an individual's success during his first year in 28 Georgia colleges.

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.

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—1962-1963

The Student Council, which was first established in 1922, is the student government organization of Georgia Tech. Through its elected representatives, it exercises supervisory authority over all extra-curricular student activities except YMCA and Athletics.

The Student Council officially represents and acts as principal liaison agent between the general student body and the faculty. It controls the use of student activity fees and handles all financial matters involving the general student body.

Also the Student Council has charge of the chartering of all student organizations. Through a series of standing committees and some temporary committees, the work of the Council is carried on in every field of student activity.

The Student Council is composed of representatives from each class at Georgia Tech. There are four Freshman representatives, six Sophomore representatives, eight Junior representatives, and sixteen Senior representatives (representing and elected by the Seniors in the individual Departments). Supplementing this group are the Senior Class Officers. The Associate Dean of Students is Faculty Advisor for the Student Council.

Officers:
William Gerald Cox, President
Donald L. House, Vice President
Thomas K. Winingder, Judiciary Cabinet Chairman
John E. Hayes, Secretary
William W. George, Treasurer
Dean James E. Dull, Faculty Advisor

Senior Class Officers:
Terry L. Gerber, President
Robert W. Tyree, Vice President
James J. Baldwin, Secretary-Treasurer

Senior Departmental Representatives:
Paul W. Morgan, A.E. John R. Dillon, E.E.
Barbara F. Gruber, Arch. William Y. McCaslin, E.E.
Joseph C. Roy, Arch. Sam L. Van Landingham, M.E.
Erik K. Straub, C.E. Joseph E. Kayes, M.E.
Walter L. Busbee, Ch.E. Winston L. Duke, Phys.
Peter D. Rhodes, I.E. Carlton C. Westberry, T.E.
Thomas K. Winingder, I.E. William P. Dickson, Comb.
Robert S. Caldwell, I.M. Robert E. Gahagan, Co-op.

Junior Class Representatives:
Fred M. Hirons, Chairman John E. Hayes
Calvin W. Battle Joel F. Parker
Homer F. Brantley Henry C. Sawyer
William W. George Henry G. Thrasher
Sophomore Class Representatives:
Ronald D. Stallings, Chairman
Gilbert F. Amelio
John W. Kelly
Kenneth E. Perry
Robert C. Scruggs
Paul L. Strong

Freshman Class Representatives:
Logan T. Gay, Chairman
Jack S. Painter
Edwin C. Rodgers
Howard T. Tellepsen

Members at Large:
Richard C. Stoddard
Daniel R. Tucker

Honorary Members:
Barbara Ann Bartlett, Coed Representative
Michael L. Rogers, Technique Representative
Robert Joe Johnson, Graduate Senate Representative
Robert Savage, International Students Representative

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 1962-63 were:

Acting Chairman and Treasurer: Dean W. Eugene Nichols; Secretary: William Y. McCaslin

The Technique
Michael L. Rogers ........................................................................................................... Editor
James E. Hicks ................................................................................................................ Business Manager
Karl M. Murphy ................................................................................................................. Faculty Advisor

The Blue Print
Edward B. Joy ................................................................................................................. Editor
Danny Hartley ................................................................................................................ Business Manager
Arthur F. Beckum, Jr. ................................................................................................. Faculty Advisor

The Georgia Tech Engineer
Thos. Muller ..................................................................................................................... Editor
Allen C. Sickel ................................................................................................................ Business Manager
William W. Hines ......................................................................................................... Faculty Advisor

The Rambler
Charles K. Edmondson .................................................................................................. Editor
Donald Higgins ................................................................................................................ Business Manager
Robert B. Wallace, Jr. ................................................................................................. 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, television, club and meeting rooms, a dark room, a picnic area, and equipment for chess, billiards, table tennis, and weight lifting.

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 ENGINEER, the RAMBLER, 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, service, and recreational program.

RECREATIONAL PROGRAMS — Regular Friday evening OPEN HOUSE DANCES are held from 8:00 until 11:00 p.m. Special recreational outings are conducted at the Y.M.C.A. Camp, and many affairs of a leisure time nature are conducted for Tech students.

FRESHMAN Y.M.C.A. CAMP—A four-day orientation and briefing session held off campus for incoming freshmen.

Y.M.C.A. CAMP—Available to all Georgia Tech students, faculty and their friends for picnics and outings.

SCHOLARSHIPS—THE WORLD STUDENT FUND offers three scholarships each year to Tech students for study abroad, and brings each year, as guests of Georgia Tech, seven students from foreign lands.

Other 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 extracurricular 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 Dull, as acting 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 1962-1963

I. F. C.

THOMAS M. CRAIG .................................................. President
CHARLES L. SCHREEDER .............................................. Vice-President
JAMES R. JOLLY .................................................. Secretary
GEOFFREY C. GILL .............................................. Treasurer
DEAN JAMES E. DULL ........................................ Faculty Advisor

Fraternity ................................. Faculty Advisor

Alpha Epsilon Pi .......................................................... Robert Scharf
Alpha Tau Omega ................................................ Roane Beard
Beta Theta Pi ........................................................ Harry Baker
Ch I Phi ............................................................ Glenn Gilman
Chi Psi .............................................................. M. Carr Payne
Delta Sigma Phi .................................................. Walter H. Tripod
Delta Tau Delta .................................................. J. J. Canova
Delta Upsilon ......................................................... B. A. Gilbreath
Kappa Alpha ............................................................... Beverly M. Leigh
Kappa Sigma .......................................................... Lane Mitchell
Lambda Chi Alpha ................................................ Charles B. Pyles
Phi Delta Theta ......................................................... Mrs. J. H. Crosland
Phi Epsilon Pi .................................................. William M. Eastman
Phi Gamma Delta .................................................. Harrison M. Wadsworth
Phi Kappa Sigma .................................................. Douglas H. Hutchinson
Phi Kappa Tau .......................................................... Frank M. White
Phi Sigma Kappa .................................................. Homer V. Grubb
Pi Kappa Alpha .......................................................... A. B. Caseman
Pi Kappa Phi .............................................................. Neil DeRosa
Sigma Alpha Epsilon ................................................ James D. Landrum
Sigma Chi ........................................................ W. C. Bliss
Sigma Nu ............................................................. H. G. Carmichael
Sigma Phi Epsilon ................................................ John M. Wallace
Tau Kappa Epsilon ................................................ John D. Neff
Theta Chi ............................................................ Irving F. Foote
Theta Xi .............................................................. J. L. Caldwell

Sorority ................................. Faculty Advisor

Alpha Xi Delta ............................................................. R. E. Stiemke
# Professional and Technical Societies

## Departmental Societies

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<tr>
<th>Society</th>
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<tr>
<td>American Association of Textile Colorists and Chemists</td>
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<tr>
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<td>Lane Mitchell</td>
</tr>
<tr>
<td>American Chemical Society</td>
<td>D. K. Carpenter</td>
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<td>American Institute of Architects</td>
<td>Peter Norris</td>
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<td>American Institute of Chemical Engineers</td>
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<td>S. C. Barnett</td>
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<tr>
<td>Association of Industrial Design Students</td>
<td>W. J. Seay</td>
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<tr>
<td>Georgia Tech Planner's Society</td>
<td>M. G. Little</td>
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<tr>
<td>Institute of Aerospace Sciences</td>
<td>J. E. Hubbartt</td>
</tr>
<tr>
<td>Institute of Radio Engineers</td>
<td>T. M. White</td>
</tr>
<tr>
<td>Psi Society (Psychology)</td>
<td>R. P. Moll</td>
</tr>
<tr>
<td>Society for Advancement of Management</td>
<td>J. L. Caldwell</td>
</tr>
<tr>
<td>Society of American Military Engineers</td>
<td>Lt. Col. M. I. Wallace</td>
</tr>
<tr>
<td>Society of Exploration Geophysicists</td>
<td>H. W. Straley</td>
</tr>
</tbody>
</table>

## Departmental Honorary Societies:

<table>
<thead>
<tr>
<th>Society</th>
<th>Faculty Advisor</th>
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</thead>
<tbody>
<tr>
<td>Alpha Pi Mu (I.E.)</td>
<td>Wm. N. Cox, Jr.</td>
</tr>
<tr>
<td>Armed Forces Chemical Association</td>
<td>Col. C. W. Carnes</td>
</tr>
<tr>
<td>Arnold Air Society</td>
<td>Maj. J. L. McCarver</td>
</tr>
<tr>
<td>Chi Epsilon (C.E.)</td>
<td>J. R. Finch</td>
</tr>
<tr>
<td>Delta Kappa Phi (Textile)</td>
<td>G. B. Fletcher</td>
</tr>
<tr>
<td>Eta Kappa Nu (E.E.)</td>
<td>F. O. Nottingham</td>
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<tr>
<td>Industrial Management Society</td>
<td>G. E. Maddox</td>
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<tr>
<td>Kappa Kappa Psi</td>
<td>B. L. Sisk</td>
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<tr>
<td>Keramos (Ceramics)</td>
<td>Lane Mitchell</td>
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<tr>
<td>Phi Psi (Textile)</td>
<td>R. C. Lathem</td>
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<tr>
<td>Pi Delta Epsilon (Publications)</td>
<td>R. B. Wallace, Jr.</td>
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<tr>
<td>Pi Mu Epsilon</td>
<td>J. M. Osborn</td>
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<tr>
<td>Pi Tau Sigma (M.E.)</td>
<td>J. H. Murphy</td>
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<tr>
<td>Scabbard and Blade</td>
<td>Capt. A. S. Dilts</td>
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<tr>
<td>Sigma Gamma Tau (A.E.)</td>
<td>A. L. Ducoffe</td>
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<tr>
<td>Sigma Pi Sigma (Physics)</td>
<td>L. D. Wyly</td>
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<tr>
<td>Tau Sigma Delta (Arch.)</td>
<td>J. H. Grady</td>
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## Honorary

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<tr>
<td>ANAK</td>
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<td>Briarean Society</td>
<td>I. E. Perlin</td>
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<tr>
<td>Koseme</td>
<td>P. B. Sherry</td>
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<tr>
<td>ODK</td>
<td>W. A. Flinn</td>
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<tr>
<td>Phi Eta Sigma</td>
<td>A. H. Bailey</td>
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<tr>
<td>Phi Kappa Phi</td>
<td>Paul Weber</td>
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<td>Tau Beta Pi</td>
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## Religious

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<tr>
<td>Baptist Student Union</td>
<td>E. Warren Woolf</td>
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<tr>
<td>Canterbury Association</td>
<td>Mr. and Mrs. F. Player</td>
</tr>
<tr>
<td>Christian Science</td>
<td>W. J. Clemence</td>
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</table>
Georgia Tech Christian Fellowship .......................................................... Dewey Carpenter
King's Men ............................................................................................... R. E. Green
Lutheran Student Association ................................................................. L. Van Gorder
Newman Club ........................................................................................... Father T. T. McNulty
Pi Tau Chi (Religious Honorary) ............................................................. Rev. Wm. Landis
Westminster Fellowship ......................................................................... R. E. Eskew

Miscellaneous

Alpha Kappa Psi ....................................................................................... R. W. Carney
Alpha Phi Omega .................................................................................... W. N. Cox, Jr.
American Marketing Association—Collegiate Chapter ......................... W. A. Flinn
American Materials Handling Society .................................................. J. M. Apple
American Rocket Society ....................................................................... F. M. White, Jr.
Band ........................................................................................................... B. L. Sisk
Bulldog Club .............................................................................................. Tommy Plaxico
Cheerleaders ............................................................................................. J. E. Dull
Chinese Club ............................................................................................. K. L. Su
Circle K. Club ............................................................................................ H. W. Sturgis
Collegiate Civitan Club ........................................................................... G. C. Griffin
Co-op Club ................................................................................................. J. G. Wohlford
Debating Club .......................................................................................... J. D. Young
Drama Tech ............................................................................................... B. M. Drucker
Flying Club ............................................................................................... R. B. Logan
Foil and Mask ............................................................................................ F. M. Hill
Georgia Tech Political Forum ................................................................. C. B. Pyles
Georgia Tech Sailing Club ....................................................................... Robert Nelson
Georgia Tech Soccer Club ................................................................-------- P. G. Mayer
Georgia Tech Wrestling Club .................................................................... W. E. Nichols, G. R. Slayton
Glee Club .................................................................................................. W. C. Herbert
Graduate Student Senate ......................................................................... M. J. Goglia
International Students Organization ...................................................... L. W. Hope
Judo Club .................................................................................................. M. N. Dunham
Pan-American Club ................................................................................ L. J. Zahn
Pershing Rifles .......................................................................................... Capt. Walker
Philosophy Club ........................................................................................ Robert Scharf
Pi Sigma Epsilon ....................................................................................... W. A. Flinn
Radio Club ................................................................................................. R. A. Martin
Rambling Reck Club ................................................................................ J. E. Dull
St. Patrick's Council ................................................................................. B. J. Dasher
Semper Fidelis .......................................................................................... Maj. F. W. Harris
Society for the Advancement of Management ....................................... J. L. Caldwell
Society of Automotive Engineers .......................................................... R. L. Allen
Society of Women Engineers ................................................................... Mrs. B. R. VanLeer
Sons of Tech Club ...................................................................................... G. C. Griffin
T. Club .................................................................J. A. Carlen
Veterans Club ......................................................F. W. Ajax
Women's Student Association ................................J. E. Dull

**YMCA Groups**

Alpha-Y-Phalanx ..................................................Gerald K. Irminger
Barbell Club .........................................................Gerald K. Irminger
Chess Club ..........................................................Gerald K. Irminger
Executive Roundtable ...........................................Gerald K. Irminger
Gamma Psi ..............................................................Mrs. Clyde Lyon
Gavel Club .............................................................Gerald K. Irminger
Photography Club ...................................................Mrs. Clyde Lyon
Recreation Council ................................................Gerald K. Irminger
Sigma-Y-Phalanx ...................................................Gerald K. Irminger
T Book Staff ..........................................................Mrs. Clyde Lyon
Triangle Club ........................................................Mrs. Clyde Lyon
World Student Fund ...............................................R. C. Commander
Y.M.C.A Cabinet ....................................................R. C. Commander
SCHOLARSHIPS AND LOAN FUNDS

Rules and Regulations Governing Scholarships and Fellowships

1. The majority of the scholarships available through the Georgia Institute of Technology are restricted to those undergraduates who have high academic ability and good character but lack sufficient funds to continue their college education. Fellowships are available to graduates of recognized colleges and universities who have demonstrated an interest in creative work and advanced professional work in order to extend the boundaries of their knowledge.

2. An application in writing on a form obtainable from the Georgia Institute of Technology is required of each applicant. Scholarship forms are available from the Registrar or the Dean of Students, and fellowship forms from the Dean of the Graduate Division. Prospective students must also submit in advance the necessary applications for admission to the Institute.

3. Each application must be approved by the appropriate committee before a scholarship or fellowship will be deposited with the Controller of the Georgia Institute of Technology who will release the necessary funds to the recipient upon proper authorization from the appropriate committee.

4. Certain scholarships and fellowships are renewable provided the recipients demonstrate high scholastic ability in their studies and outstanding character.

5. All entering freshmen are required to take the College Entrance Examination Board Scholastic Aptitude Tests prior to acceptance at the Georgia Institute of Technology. Results of these tests will be considered by the Committee on Student Grants-In-Aid and Scholarships in making scholarship awards to entering freshmen.

Special Scholarship Information

The Georgia Institute of Technology is a member of the College Scholarship Service. All new students who are applicants for financial aid must submit the Parents' Confidential Statement to the College Scholarship Service at Box 176, Princeton, N. J., or Box 27896, Los Angeles 27, California. Forms may be obtained at high schools. Georgia Tech students may secure the required forms from the Office of the Registrar.

Aluminum Company of America Scholarships
Five $625 Engineering Scholarships. 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.

Anonymous Alumnus Scholarship
An alumnus of the Class of 1926 has made available an unrestricted scholarship amounting to $400. The recipient will be required to express his thanks for the award.

Armco Foundation Scholarships
Two scholarships, one junior and one senior, per year. Each scholarship amounts to $300 per year for a Georgia student or $600 per year for an out-of-state student. Restricted to Civil Engineering students. Selection is made by the institution subject to the approval of donor.
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.

Atlanta Textile Club Scholarship
One scholarship to be awarded to a junior in the A. French Textile School. Preference will be given to students from the Atlanta area.

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.

Borden Freshman Prize
An award of $200 to the student finishing the freshman year with the highest average.

Burlington Industries Foundation Scholarships
One $500 scholarship to be awarded to a student entering the junior class. Award is renewable for student's senior year. One additional $500 unrestricted scholarship.

Callaway Scholarship
A scholarship in the amount of $500 for a rising junior with a scholastic rank in the upper third of his class and majoring in Textile Engineering, Textiles, or Textile Chemistry. Award is renewable for the senior year provided the student has maintained a scholastic rank in the upper third of his class. The Scholarship Committee will screen all applications and this Committee, together with a representative of the Callaway Scholarship Plan Committee, will select the applicant deemed best qualified for and most deserving of the award.

Ciba Company Scholarship
Two awards of $500 each, one for a junior and one for a senior. Students must be enrolled in the A. French Textile School and majoring in Textile Chemistry.

Cincinnati Milling Machine Company Scholarship
An award of $500 for a sophomore co-operative student preferably in Mechanical or Electrical Engineering. The award may be renewed for succeeding years.

Coats & Clark Scholarships
Two $500 scholarships to be awarded each year to students majoring in Chemistry, Textile Chemistry, Textile Engineering, Textiles, Chemical Engineering, Industrial Engineering, Electrical Engineering, or Mechanical Engineering. These scholarships are renewable for three additional years provided student maintains proper requirements. Award will be made to a high school graduate entering Georgia Tech for his freshman year. If possible, one award will be made to an applicant from North Georgia and one to an applicant from South Georgia, preference to be given to employees or to children of employees of Coats & Clark, Inc.

Chemstrand Corporation Scholarship
An award of $500 restricted to a senior majoring in Chemical Engineering.

Crown Zellerbach Scholarships
Two scholarships of $500 each, unrestricted as to the field of study.

Damar, Inc. Scholarship
A $300 scholarship made available by Damar, Inc., Marietta, Georgia. Restricted to students from Cobb County.

Ethyl Corporation Scholarship
A scholarship for a student majoring in Industrial Engineering. The amount of the award is determined by the Scholarship Committee.

Dean George C. Griffin Scholarships
Income from property amounting to $1000 a year has been made avail-
able for 99 years by Mr. Lonnie Allen Morris, Class of 1936, a resident of Miami, Florida, to set up in honor of George C. Griffin, Dean of Students at Georgia Tech, the Dean George C. Griffin Scholarships. First preference for award of the scholarships will be given to residents of Miami or Dade County, Florida. Second preference will be to those from other sections of Florida. The main qualifications for the scholarships will be academic ability and financial need. Applications should be made directly to the Georgia Tech Committee on Student Grants-in-Aid & Scholarships.

**John and Mary Franklin Scholarships**

Three thousand dollars annual scholarship fund established to aid worthy students from the State of Georgia. Awards are made on the basis of need, ability, evidence of good character and scholastic standing by the Georgia Institute of Technology in accordance with its customary procedure.

**Fulton Federal Savings Scholarship**

Three scholarships of $250 each for students majoring in the School of Architecture who are residents of Georgia. Ordinarily one award will go to a sophomore, one to a junior, and one to a senior.

**Geigy Dyestuffs Scholarship**

An award of $250 for a junior majoring in Textile Chemistry, Chemical or Textile Engineering.

**Douglas Aircraft Company, Inc. Scholarship**

One scholarship in the amount of $750 to be awarded to a senior student in Aerospace, Mechanical, or Electrical (electronics) Engineering.

**General Motors Scholarships**

The Georgia Institute of Technology has been allocated three scholarships to award each year under the General Motors College Scholarship Plan. Awards are to be made to entering freshmen and are renewable for three additional years. Amount of the award will range from $200 to $2000 per year, depending on the financial need of the recipient.

**Gilman Foundation Scholarship**

An award of $1000 for an entering freshman, renewable for three additional years. Preference will be given in the order indicated:

1. Male residents of St. Marys, Georgia who are employed by, or sons of employees of, St. Marys Kraft Corp., St. Marys Railroad Co., or Kraft Bag Corporation.
2. Any male employee or son of an employee of above mentioned companies, Gilman Paper Co., The Cellucord Corp., or Gilman Electric Light and Power Co., regardless of residence.

**Goodyear Foundation Scholarship**

An award of $1000 for a junior or senior majoring in a field of engineering accredited by E.C.P.D.

**The John P. Holmes Scholarship 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 Institute Scholarship 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.

**C. D. LeBey Memorial Scholarship**

One scholarship each year, unrestricted as to field of study, has been established in memory of Mr. C. D. LeBey, President, Class of 1922. First preference will be given to residents of Georgia, second preference to residents of Florida, Alabama, or Tennessee. Value, approximately $250.
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.

R. L. "Bob" MacDougall Scholarship
One scholarship each year, unrestricted as to field of study, has been established in the name of R. L. MacDougall by the Class of 1925 and friends. Value, approximately $300.

The Martin Aircraft Scholarship Fund
One or more annual scholarship grants of $466 each to cover tuition for the first year of cooperative students from Maryland, the District of Columbia, or Florida.

McLendon Scholarship Fund
Fund of $500 established to be awarded to qualified students of good character, in financial need, and who would be otherwise unable to pursue their education.

The Mead Corporation Scholarship
One scholarship each year, unrestricted as to field of study. This award is granted on the basis of financial need and academic ability. The amount is to be determined.

Minnesota Mining and Manufacturing Company Scholarship
A fund of $1,000 to be used each year for scholarships to students majoring in engineering.

Monsanto Chemical Company
One $500 scholarship to be awarded to an outstanding student for his senior year of study in the School of Chemical Engineering. Selection of recipients will be made by the Scholarship Committee of the Georgia Institute of Technology on recommendation of the School of Chemical 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.

Owens-Illinois Scholarship
One scholarship for a non-resident student or two scholarships for resident students to be awarded each year. Each scholarship will cover tuition, other college fees, and the cost of required textbooks and laboratory supplies. Award will be made to a male high school graduate and will be renewable for three additional years under certain conditions.

Patterson and Dewar Scholarship
A fund of $400 per year, established by Patterson and Dewar Engineers, Inc., to be awarded to a deserving student. The scholarship is made in behalf of the clients of the firm in lieu of the Christmas gifts of earlier years. The recipient is requested to assume the responsibility to repay voluntarily to the scholarship the funds received if practical in the future.

Pennsylvania Glass Sand Corporation Merit Award Scholarship
An award covering tuition and fees for the senior year to the student in Ceramic Engineering who completes the junior year with the highest average.

Jack Phinizy Educational and Charitable Foundation Trust
Awards of $200 each for freshman and sophomore students in engineering. Restricted to students from Florida, Georgia, or North Carolina, with preference given to students of Richmond County, Georgia. Granted on the basis of academic ability, engineering aptitude, and financial need.

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.
The Rayonier Scholarships
Two scholarships of $500 each established by The Rayonier Foundation. One of the scholarships is available for a senior in the School of Chemical Engineering and the other for a senior in the School of Industrial Management.

Regents' State Scholarships
A fund of approximately $13,000, Georgia Tech's share of a $100,000 fund appropriated by the General Assembly for the University System. Scholarships are for deserving students who are legal residents of the State of Georgia. The amount of each scholarship is determined by the Scholarship Committee. Special provision is that the recipients must agree to stay and work in the State of Georgia for one year for each $1,000 received under this program.

Rotary Club of Buckhead Scholarship
An award of approximately $300 to an entering freshman. Applicant must be from one of these high schools: Chamblee, North Fulton, Northside.

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 School of Electrical or Mechanical Engineering or Physics. Student must complete, prior to earning his undergraduate degree, at least twelve hours study in electricity.

Schroeter-Ergenzinger Foundation Scholarships
Two awards of $1,000 each for entering freshmen. May be renewed for three additional years.

Seydel-Woolley & Company Scholarship
One $250 scholarship to be given to an outstanding junior or senior studying in the field of Textile Engineering or Textile Chemistry.

Shaheen Foundation Scholarship
The interest on a fund established by Mr. Azeem Shaheen of Dalton, Georgia is used for scholarships for students majoring in engineering. Preference will be given to residents of Whitfield County, Georgia.

Alfred P. Sloan Foundation Scholarship
Two awards (amount to be determined) for matriculating male freshmen who plan to major in one of the traditional engineering disciplines or in basic science. The recipients must have established a record of high character, leadership potential, and scholarly promise. The awards may be renewed for three additional years.

Socony Mobil Scholarship in Civil Engineering
A scholarship covering tuition and fees to a maximum of $400 plus a stipend of $500, restricted to a student majoring in Civil Engineering. Selection will be made jointly by the Georgia Tech Scholarship Committee and the Socony Mobil Oil Company, Inc. on the basis of scholastic ability, interest in exploration activities of the petroleum industry, and career potentiality. A $500 grant to the major school of the recipient accompanies the scholarship.

Socony Mobil Scholarship in Geophysics
A scholarship covering tuition and fees to a maximum of $500 plus $400, restricted to a senior student majoring in Physics (Geophysics Option) or Electrical Engineering with a strong interest in the Petroleum Industry. Selection will be made jointly by the Georgia Tech Scholarship Committee and the Socony Mobil Oil Company, Inc. on the basis of scholastic ability, interest in exploration activities of the petroleum industry, and career potentiality. A $400 grant to the major school of the recipient accompanies the scholarship.

Square D Foundation Scholarship
One scholarship of $600 per year established by the Square D Foundation. Award is to be made to a first-quarter junior student in the School of Electrical, or Mechanical.
Scholarships and Loan Funds / 229

Starke Patteson Scholarship
One or more annual tuition scholarships. Recipients are to be selected from boys in the Co-operative Plan from Shelby County, Tennessee, high schools. Awards will be made by the Georgia Institute of Technology Scholarship Committee.

Texaco Scholarship
A grant of $1800 to be awarded at the discretion of the scholarship committee. Preference will be given to junior or senior students in Chemical, Electrical, Industrial, or Mechanical Engineering.

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 or be already enrolled 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.

The Trane Company Scholarship
One $500 scholarship to be awarded annually to a student, preferably a mechanical engineer, for his senior year of study. Recipient must be a citizen of the United States and must have a standing in the upper 25% of his class. Good character, outstanding technical and administrative potential, extracurricular activities and the need of the student will be given consideration.

Triton Community Fund Scholarship
A $300 scholarship made available by Phillips 66 Service Station Dealers in the Atlanta area. Restricted to an entering male freshman who is a graduate of an Atlanta area high school.

Union Bag-Camp Paper Corporation Scholarship
An award of $500 for a junior. Alternated between Chemical Engineering and Industrial Engineering. May be renewed for the senior year.

Union Carbide Engineering Scholarship
A $500 scholarship for an entering freshman who will major in Chemical or Mechanical Engineering. Renewable for three additional years. Students entering in the co-operative plan are not eligible for this scholarship.

Universal Oil Products Company Scholarship
$1000 per year scholarship fund established to aid worthy students in their junior or senior years of study in the School of Chemical Engineering. Awards are made on the basis of academic record and financial need.

Western Electric Company Scholarships
Three scholarships to cover cost of tuition, books, fees, and other items, except room and board. Preference will be given to upperclassmen in the College of Engineering, but may be awarded to first or second year students.

Wilcox-Connally Scholarship
An award of $250 for a student in the School of Architecture.

Woman's Aero Club of Atlanta Scholarship
An award of $250 for a junior or senior majoring in Aerospace Engineering.

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.

GEORGIA TECH CLUB SCHOLARSHIPS

Greater Atlanta, Georgia Tech Club
Fifteen or more freshmen scholarships of $300 each for qualified needy students from the Metropolitan Area. Students are urged to attend on the Co-operative plan.

Augusta, Georgia Tech Club
One, possibly two, $300 scholarships available to freshmen from the Augusta area.

Birmingham, Alabama Georgia Tech Club
One $850 scholarship for freshmen from Birmingham and vicinity.

Chattanooga Georgia Tech Club
One $400 scholarship (Co-op) for freshmen from Chattanooga, Tennessee and vicinity.

Macon, Georgia Tech Club
One, possibly two, $300 scholarships available to freshmen from the Macon area.

Savannah Georgia Tech Club
Two $300 scholarships for students from the Savannah area.

South Texas Alumni Association
One $500 scholarship (Co-op) for freshmen from Houston, Texas and nearby cities. Engineering courses only available.

Southwest Georgia Alumni Club
Three $300 scholarships (Co-op) for freshmen from the Albany, Georgia area. Engineering courses only available.
**LOAN FUNDS**

Applicants for loans must qualify in scholarship and character besides presenting evidence of bona fide need of financial assistance.

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<td>Wm. Ott Alston, Jr., Memorial Loan Fund</td>
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<td>Architects Loan Fund</td>
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<td>J. Baldwin Loan Fund</td>
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<td>M. R. Berry Loan Fund</td>
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<td>Clyde L. King, Sr., and John King Memorial Fund</td>
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<td>Malta Lodge Loan Fund</td>
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<td>Lona Mansfield Loan Fund</td>
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<td>ASME—Roger A. Martin Memorial Fund</td>
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<td>E. P. McBurney Loan Fund</td>
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<td>Sam W. Small Loan Fund</td>
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<td>J. P. Stevens Loan Fund</td>
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<td>Clark Thornton Memorial Fund</td>
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<td>E. A. Turner Loan Fund</td>
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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, P. O. Box 1238, Columbus, Georgia.

Emergency 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 eleven 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; the Edward W. Navickas Fund; the Edward W. Navickas, Jr. Fund; the John Jarrell Loan Fund; H. O. Henry “Ozzie” Ward Fund; Major General Haywood Shepherd Hansell Fund; Bob Eskew Fund; Billy Reese Fund; George C. Griffin Fund; and the Tech Women’s Club Loan Fund. Loans are made from these funds without interest for emergencies only.

National Defense Loans
With the enactment of the National Defense Education Act in September, 1958, a new long-term financial aid program was created for college students. This act makes it possible for many students denied a college education because of financial need an opportunity to receive such an education.

In order to be eligible for a loan under this plan, a student must:

(1) Be a full-time college student or be accepted for admission as a full-time student at Georgia Tech.

(2) Be in good standing and capable of maintaining such a standing.

(3) Show evidence of financial need in order to complete his course of study.

(4) Sign a loyalty oath and affidavit.

The National Defense Loan bears simple interest upon the unpaid balance at 3% a year.

The principal amount of the loan, together with the interest, should be repaid to the institution in ten equal installments. The repayment period begins one year after the date the borrower ceases to be a full-time student at an institution of higher education.

Applications may be secured by writing to the Dean of Students at the Georgia Institute of Technology.
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.

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.

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 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.

Chi Epsilon Award
The Chi Epsilon Award is given annually by the Georgia Tech Chapter. The recipient is chosen from the five highest members, based on scholarship of the senior class. The final choice of the recipient is made from the five candidates on the basis of leadership, sociability, practicality and scholarship. The winner receives a certificate and his name is placed on an honor roll in the Civil Engineering Building.

Textile Scholarship Medals
The Georgia Textile Manufacturers' Association awards a watch 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. The 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 scholastic cup to the chapter of that organization which makes the highest scholastic average.

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.
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.

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).

Aerospace 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 Aerospace 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 Foundation, Inc. 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 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 at the Annual Honors Day Exercises.

The American Institute of Industrial Engineers, Atlanta Chapter Award
The American Institute of Industrial Engineers, Atlanta Chapter, award is presented 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. The presentation is made annually at the Honors Day exercises.

The American Institute of Industrial Engineers, Student Chapter Award
The American Institute of Industrial Engineers, Student Chapter, award is presented to the Industrial Engineering sophomore who is chosen from the top three in his individual engineering class as having the best combination of personal and academic qualities. This 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.

**The American Society of Civil Engineers Award**

The American Society of Civil Engineers Award is given annually by the Georgia Section of the ASCE. The recipient is selected by a committee from a list of three candidates who have the highest point average among the graduating members of the Student Chapter of the ASCE and who have completed at least eight quarters of work at the Institute. The Award consists of the Junior Membership entrance fees and a cash prize of $90.00.

**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.

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 American Society of Chemical Engineers presents annually a medal to the most outstanding Chemical Engineering student enrolled in the Advanced Course of Army, Navy, or Air Force R.O.T.C.

The Association of the United States Army presents annually medals to the outstanding 1st year Advanced Course cadets of the Infantry R.O.T.C. battalion.

The Armed Forces Communication Association presents awards annually to the outstanding sophomore, junior, and senior Army, Navy, or Air Force R.O.T.C. cadets who attain the highest ratings for proficiency in scholarship in Military, Naval, or Air Science 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 R.O.T.C.
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.

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 outstanding 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.

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 ROTC 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 junior, 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

Board of Directors


Intercollegiate Staff


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 Association / 239

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 52,300 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 1,000 men have been constructed.

The completion of the Alexander Memorial Center in September of 1956 has given our basketball, Physical Training and Intramural programs a great impetus. The coliseum will seat approximately 7,000 spectators for basketball. It has two full-size basketball courts. This building is also used for numerous school functions and is owned by the Georgia Institute of Technology.

The Physical Training Building adjoining the coliseum has dressing rooms and lockers for Physical Training, basketball, visiting teams, and officials. A full-size basketball court and offices for our Physical Training faculty (sophomores) are in this building.

The “old” gymnasium seats 2,000 for athletic indoor events and 3,000 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 and other money furnished by the Georgia Tech Athletic Association, 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 five million dollars. Acknowledgement 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 5,000.

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 all over the world.

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. Furnish 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.
9. Raise funds for Georgia Tech through the Annual Alumni Roll Call.

The Alumni Secretary acts in a clearing capacity for Georgia Tech men after their graduation. All Georgia Tech men are urged to keep their files in his office up-to-date, giving their location, activities, and other valuable information, in order that they may be consulted without delay on problems of mutual interest.

The Georgia Tech Foundation, Inc. is a non-profit corporation organized and operated solely for the purpose of soliciting and administering funds for the benefit of the Georgia Institute of Technology and its students. The Georgia Tech Foundation, Inc., is directed by a Board of outstanding alumni business leaders, who administer the funds received in such a way as in their judgment would most effectively improve the standard of the school.

The funds received by the Foundation are used presently for the following purposes:

1. To supplement the compensation of faculty members in order to obtain or retain outstanding faculty members and thus improve the standard of education at the Georgia Institute of Technology.

2. To acquire special supplementary equipment, which cannot be provided by state funds, for the use of the Georgia Institute of Technology.

3. To enable faculty members to improve their professional qualifications and standing by grants to obtain advanced degrees, etc.

The majority of donations received are unrestricted and are used by the Foundation at the discretion of its Board of Trustees. Some donations are received for designated purposes and are used by the Foundation only for the purpose designated, provided they are for the use of the Georgia Institute of Technology and within the charter purposes of the Foundation.

Members of the Foundation Board of Trustees are: Jack F. Glenn, '32, Atlanta, President; John C. Staton, '24, Atlanta, Vice President; Henry W. Grady, '18, Atlanta, Treasurer; Joe W. Guthridge, Exec. Secretary; Ivan Allen, Jr., '33, Atlanta; John P. Baum, '24, Milledgeville, Ga.; Fuller E. Callaway, Jr., '26, LaGrange, Ga.; Oscar G. Davis, '22, Atlanta; Robert H. Ferst, '38, Atlanta; Y. Frank Freeman*, '10, Hollywood, Calif.; Julian T. Hightower, '19, Thomaston, Ga.; Wayne J. Holman, Jr., '28, New Brunwick, N. J.; Howard B. Johnson, '34, Atlanta; George T. Marchmont*, '07, Dallas, Texas; George W. McCarty, '08, Atlanta; Jack J. McDonough, '23, Atlanta; Walter M. Mitchell, '23, Atlanta; Frank H. Neely*, '04, Atlanta; William A. Parker, '19, Atlanta; I. M. Sheffield, '20, Atlanta; Hal L. Smith, '26, Atlanta; William C. Wardlaw, Jr., '28, Atlanta; Robert Tharpes, '34, Atlanta; Charles E. Thwaite, Jr., '33, Atlanta; Robert H. White*, '14, Atlanta; George W. Woodruff, '17, Atlanta; Charles R. Yates, '35, New York, N. Y.

Income Tax Provisions of Contributions

Funds held by the Georgia Tech Foundation, Inc. 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:

*Trustee Emeritus.
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.

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 1947, the Foundation 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 sixteenth year, July, 1962.

The results of the first fifteen years of the 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. Additional support is being received from industry and foundations within the state. The Joint Tech-Georgia Development Fund is proving to be very helpful to both Georgia Tech and Georgia.

For the past two years, the Georgia Institute of Technology has been recognized nationally with the first place award “for sustained alumni support” among all public institutions of higher learning. In 1962, the Institute also received the national runner-up award “for sustained alumni support” among all colleges and universities.

The aid realized through the Roll Call supports the work of the National Alumni Association as well as the Georgia Tech Foundation, Inc. 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, Inc. continues to be one of the most vital factors in the growth and development of the Georgia Institute of Technology.
Administrative Council—1963-1964*

Fred W. Ajax
  Director of Public Relations

Jamie R. Anthony
  Controller

W. Roane Beard
  Alumni Secretary

Walter S. Buckingham, Director
  School of Industrial Management

William L. Carmichael
  Registrar

Arthur M. Coleman, Head
  Department of Physical Training

Mrs. J. Henley Crosland
  Director of Libraries

Benjamin J. Dasher, Director
  School of Electrical Engineering

Robert L. Dodd
  Director of Athletics

Bertram M. Drucker
  Director, School of Mathematics

Donald S. Dunlap, Col., USAF
  Professor of Air Science

Donnell W. Dutton, Director
  School of Aerospace Engineering

Mario J. Goglia
  Associate Dean of Faculties
  Dean of Graduate Division

Charles W. Gorton (3)
  Faculty Representative

George C. Griffin
  Dean of Students

Frank F. Groseclose, Director
  School of Industrial Engineering

Homer V. Grubb, Director
  School of Chemical Engineering

Edwin D. Harrison
  President

William B. Harrison, Director
  School of Nuclear Engineering

Paul M. Heffernan, Director
  School of Architecture

Ralph A. Hefner, Dean
  General College

George Hendricks, Head
  Department of Social Sciences

Walter Herbert, Head
  Department of Music

Joseph H. Howey, Director
  School of Physics

Robert S. Ingols, Director
  School of Applied Biology

R. Kenneth Jacobs, Head
  Department of Engineering Graphics

Lawrence V. Johnson, Director
  Engineering Extension Division

William B. Jones (2)
  Faculty Representative

Beverly M. Leigh, Jr., Col., USA
  Professor of Military Science

Edward H. Loveland, Director
  School of Psychology

Jesse W. Mason, Dean of
  Engineering

Hoyt L. McClure, Director
  Southern Technical Institute

Lane Mitchell, Director
  School of Ceramic Engineering

Henry M. Neumann (1)
  Faculty Representative

Kenneth G. Picha, Director
  School of Mechanical Engineering

Milton E. Raville, Director
  School of Engineering Mechanics

Frederick W. Schultz, Director
  School of Civil Engineering

William M. Spicer, Director
  School of Chemistry

Robert E. Stiemke
  Associate Dean of Faculties
  Administrator of Research

James L. Taylor, Director
  A. French Textile School

Andrew J. Walker, Head
  Department of English

Paul Weber
  Dean of Faculties

Wyatt C. Whitley, Director
  Engineering Experiment Station

James G. Wohlford, Director
  Cooperative Division

Richard H. Woodfin, Capt., USN
  Professor of Naval Science

J. Dixon Wright, Head
  Department of Modern Languages

Three Student Representatives

*Number in parentheses after faculty representative's name indicates years to be served on Administrative Council.
Standing Committees of the General Faculty—1963-1964*

ADVANCED PLANNING—Mason, Heffernan, Hefner, Director of Physical Plant Department, Rainey (3), Finn (2), Whitley (2).


FACULTY COUNCIL—Almon (3), Hochman (3), Gaffney (2), Mayer (2), MacKay (1), Sherry (1).

INFIRMARY—Riggsbee, Coleman, G. C. Griffin, Henry, Weber, Student Representative.

LIBRARY—Ducoffe (3), Osborn (2), Kyle (1), Crosland.

PUBLIC RELATIONS—Ajax, Welser (3), Flege (2), Herndon (1), Whitley (1).

PUBLICATIONS—Eberhardt (3), Hubbert (2), Long (1), Crosland, Wallace.

STATE RESIDENCE—Anthony, Carmichael, G. C. Griffin.

STATUTES—Stoneking (3), Coleman (2), Sowers (2), T. W. Jackson (1), Wyly (1), Carmichael.

STUDENT LECTURE AND ENTERTAINMENT—F. M. White (3), Mayer (2), Law (1), Ajax, Herbert, 4 Student Representatives.

STUDENT LOANS—Anthony, G. C. Griffin, Guthridge.


Special Committees of the Faculty—1963-1964*

CIVIL DEFENSE—Fincher, Caseman, Covault, Wang, Zimmerman, Director of Physical Plant.

FACULTY AWARDS—Goglia, Atchison, Carstens, Dallas, T. H. Hall.

FOREIGN STUDENTS—Wright, Comer, Dull, Hope, Spillman, Sturgis, Zahn.

INSTRUCTION MANUAL—Jacobs, Chaikin, Loveland, McClure, Sisk.

INSURANCE—Groseclose, Eaton, Marshall, Starrett.

NON-ACADEMIC PERSONNEL—Marshall, Helms, Logan.


PARKING—Anthony, Cox, G. C. Griffin, W. B. Harrison, Moll, Director of Physical Plant, two Student Representatives.


SAFETY AND FIRE PROTECTION—Cox, Fleming, McKinley, McLendon, Ratcliff, Schutz, Director of Physical Plant.

SKILES COMMITTEE—Weber, Ajax, J. L. Taylor (3), Hamrick (2), Belling (1).

STUDENT ACTIVITIES BUILDING—G. C. Griffin, Ajax, Anthony, Dull Flinn, Heffernan, Director of Physical Plant, and three Student Members.

STUDENT RECRUITING—Carmichael, Ajax, Beard, G. C. Griffin, Wohlford.

UNIVERSITY CENTER—Groseclose, Drucker, Hefner, A. J. Walker.

VISUAL AIDS TO EDUCATION—Staton, Allen, Crosland, Gilman, Grubb, McKinley, Moll.

*Number in parentheses after faculty representative's name indicates years to be served on the committee.
Standing Committees of the Academic Senate—1963-1964*

ADMISSIONS—Carmichael, Hefner, Mason, Dallas (3), Barnett (2).

CURRICULUM—Weber, Carmichael, Hefner, Mason, Moll (3), Gorton (2), Starrett (1), Ward (1).

EXECUTIVE—Weber, Carmichael, G. C. Griffin, Hefner, Mason, Crawford (3), Cox (2), Comer (1).

GUIDANCE AND TESTING—Loveland, Carmichael, Commander, G. C. Griffin, Hefner, Mason, Nichols, Barnett (3), Slaughter (2), Brewer (1).

HONORS AND PRIZES—Carmichael, Immel (3), Harper (2), Spillman (1).


STUDENT ACTIVITIES—G. C. Griffin, Ajax, Maddox (3), McCarty (2), Spurlock (1), Student Representative.

STUDENT-FACULTY HONOR—Finn (3), J. H. Murphy (2), Stanfield (1), three Student Members.


STUDENT RULES AND REGULATIONS—Prosser (3), Caseman (2), Beckum (1), Carmichael, G. C. Griffin.

*Number in parentheses after faculty representative's name indicates years to be served on the committee.
GENERAL FACULTY

(As of April 1, 1963)

NOTE: After the name of each faculty member is listed his highest degree and the name of the institution conferring it. Professional engineers among the faculty are indicated with the authorized abbreviation of P.E. followed by the name of the state in which they are registered. Practicing architects among the faculty are indicated with the abbreviation of Reg. Arch. followed by the name of the state in which they are registered.

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(Rice University)  
Associate Professor, English

LOUIS C. YOUNG, M.S.  
(Massachusetts Institute of Technology)  
Research Engineer  
Engineering Experiment Station

ROBERT A. YOUNG, Ph.D.  
(Polytechnic Institute of Brooklyn)  
Research Associate Professor of Physics; Head, Solid State Branch  
Engineering Experiment Station
Louis J. Zahn, Ph.D.  
(University of North Carolina)  
*Associate Professor, Modern Languages*

Waldemar T. Ziegler, Ph.D.  
(Johns Hopkins University)  
*Regents' Professor, Chemical Engineering*

Robert L. Zimmerman, B.S.  
(Rensselaer Polytechnic Institute)  
*Radiological Safety Officer*  
*Engineering Experiment Station*
## INSTITUTE STATISTICS

### Graduates by Schools and by Years

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Key:
- +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:


3. Professional Degrees: in C.E., 17; in Ch.E., 1; in E.E., 11; in M.E., 1; in T.E., 1.

4. Certificates: in Arc., 43; in C.S., 38; in I.E., 1; in M.T., 1; in E.E., 150.

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## SUMMARY OF ENROLLMENT 1961-1962

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Total College Day Courses: 6,902

#### By Major Departments

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<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>537</td>
</tr>
<tr>
<td>Applied Biology</td>
<td>16</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>175</td>
</tr>
<tr>
<td>Applied Psychology</td>
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<tr>
<td>Architecture</td>
<td>353</td>
</tr>
<tr>
<td>Ceramic Engineering</td>
<td>60</td>
</tr>
<tr>
<td>Chemistry</td>
<td>161</td>
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<tr>
<td>Chemical Engineering</td>
<td>521</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>560</td>
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<tr>
<td>Electrical Engineering</td>
<td>1,364</td>
</tr>
<tr>
<td>Engineering Mechanics</td>
<td>28</td>
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<tr>
<td>Industrial Engineering</td>
<td>639</td>
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<tr>
<td>Industrial Management</td>
<td>1,110</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>819</td>
</tr>
<tr>
<td>Physics</td>
<td>301</td>
</tr>
<tr>
<td>Textile Engr., Textiles, Textile Chem.</td>
<td>166</td>
</tr>
<tr>
<td>Others</td>
<td>61</td>
</tr>
</tbody>
</table>

Total: 6,902

### Engineering Extension Division

<table>
<thead>
<tr>
<th>Division</th>
<th>Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evening School</td>
<td>3,243</td>
</tr>
<tr>
<td>Institutes and Conferences</td>
<td>1,556</td>
</tr>
<tr>
<td>Southern Technical Institute</td>
<td>1,216</td>
</tr>
<tr>
<td>Trade and Industrial Education</td>
<td>9,232</td>
</tr>
</tbody>
</table>

Total Engineering Extension Division: 15,247

Total College Day Courses: 6,902

Duplicates: 190

Grand Total: 21,959
TECHNOLOGICAL SCHOOL

Section 1. PURPOSE AND NAME. Be it enacted by the General Assembly of this State, and it is hereby enacted by authority of the same, That there shall be established in connection with the State University, and forming one of the departments thereof, a Technological School for the education and training of students in the industrial and mechanical arts. Said school shall be located, equipped and conducted as hereinafter provided.—Georgia General Assembly Acts, 1885, p. 69.

ESTABLISHMENT OF SCHOOL

Section 3. APPROPRIATION FOR. Be it further enacted by the authority aforesaid, That the sum of sixty-five thousand dollars, or so much thereof as may be necessary, be, and the same is hereby appropriated for the establishment of said school, and to carry this Act into effect, the Governor is authorized to draw his warrant on the Treasurer of the State in favor of said Commission for such parts of said sum as may be applied for in writing from time to time as said work progresses; Provided, this sum shall only be available after the first day of January, 1887, and shall then be paid only out of funds in the Treasury not otherwise appropriated; Provided, further, that this sum is appropriated with the understanding that it shall pay all the cost of grounds, buildings, machinery, tools and appliances necessary for the establishment of said school and its operations for one year, and should the said Commission find the same insufficient for this purpose, they shall, before any purchases are made, report that fact to the Governor, and in that event no warrant shall issue for any part of the sum appropriated.—Georgia General Assembly Acts, 1885, p. 71.