1969-70 GENERAL BULLETIN

COURSES / CLASSES / PROGRAMS

FLORIDA TECHNOLOGICAL UNIVERSITY ©1963

ACCENT ON THE INDIVIDUAL and ON EXCELLENCE

FIRST PRINTING – SEPTEMBER 1969
PEGASUS was the winged horse of the muses in Greek Mythology. He carried their hopes, their aspirations, and their poetry into the skies. PEGASUS is as futuristic as tomorrow's space exploration in our solar system and into the universe beyond. The seal also bridges the gap between the humanities and space technology.

Volume 3, Number 1
October, 1969
Orlando, Florida 32816

Florida Technological University reserves the right to change without notice any of the materials — information, requirements, regulations — published in this Bulletin.
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BOARD OF EDUCATION

Claude R. Kirk, Jr.
Governor

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Earl Faircloth
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Broward Williams
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and Secretary to the
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Edward W. Stoner, M.D. .......................................................... Director of Student Health Service
John J. O'Rourke, M.S. .......................................................... Director of Placement
<table>
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<th>Date</th>
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<tbody>
<tr>
<td>Sept. 5, Fri.</td>
<td>Last day for receipt of applications for regular admission to Fall Quarter.</td>
</tr>
<tr>
<td>Sept. 8-19</td>
<td>Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.</td>
</tr>
<tr>
<td>Sept. 22-26</td>
<td>Orientation and advisement for new freshmen and transfer students not pre-advised.</td>
</tr>
<tr>
<td>Sept. 29-30</td>
<td>Advisement of returning students not pre-advised.</td>
</tr>
<tr>
<td>Sept. 30, Tues. 6-8 p.m.</td>
<td>Registration by appointment of Graduate credit students.</td>
</tr>
<tr>
<td>Oct. 1, Wed. 8 a.m.-8:30 p.m.</td>
<td>Registration by appointment of returning Undergraduate credit students.</td>
</tr>
<tr>
<td>Oct. 2, Thurs. 8 a.m.-6 p.m. 6-9 p.m.</td>
<td>Registration by appointment of new full-time Undergraduate credit students.</td>
</tr>
<tr>
<td>Oct. 3, Fri. 8-12 Noon</td>
<td>Registration by appointment of new part-time Undergraduate credit students.</td>
</tr>
<tr>
<td>Oct. 6, Mon. 8:00 a.m.</td>
<td>Classes begin for Fall Quarter.</td>
</tr>
<tr>
<td>Oct. 7, Tues. 6-8 p.m. &amp; Oct. 10, Fri. 4-6 p.m.</td>
<td>Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.</td>
</tr>
<tr>
<td>Oct. 10, Fri.</td>
<td>Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Fall Quarter!</td>
</tr>
<tr>
<td>Oct. 31, Fri.</td>
<td>Deadline for withdrawal without penalty. Last day for removing Temporary Student status.</td>
</tr>
<tr>
<td>Nov. 27-28 Thurs.-Fri.</td>
<td>Thanksgiving holidays.</td>
</tr>
<tr>
<td>Dec. 1, Mon. 8:00 a.m.</td>
<td>Classes resume.</td>
</tr>
</tbody>
</table>
Educational counseling and schedule advisement for Winter Quarter (for currently-enrolled students).

Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

Classes end for Fall Quarter.

All grades due in Registrar’s Office.

Christmas holidays begin.

WINTER QUARTER 1970

Last day for receipt of applications for regular admission to Winter Quarter.

Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.

Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.

Registration by appointment of returning Graduate credit students.

Registration by appointment of returning Undergraduate credit students.

Registration of any eligible returning Undergraduate credit students not registered.

Registration by appointment of new Undergraduate credit students.

Classes begin for Winter Quarter.

Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.

Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Winter Quarter!
<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Feb. 3, Tues.</td>
<td>Deadline for withdrawal without penalty. Last day for removing Temporary Student status.</td>
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<tr>
<td>Mar. 2-6 Mon.-Fri.</td>
<td>Educational counseling and schedule advisement for Spring Quarter.</td>
</tr>
<tr>
<td>Mar. 4, Wed.</td>
<td>Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.</td>
</tr>
<tr>
<td>Mar. 19, Thurs. 9:30 p.m.</td>
<td>Classes end for Winter Quarter.</td>
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<tr>
<td>Mar. 23, Mon. 12:00 Noon</td>
<td>All grades due in Registrar's Office.</td>
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**SPRING QUARTER 1970**

<table>
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<tr>
<td>Mar. 6, Fri.</td>
<td>Last day for receipt of applications for regular admission to Spring Quarter.</td>
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<td>Mar. 9-20 Mon.-Fri.</td>
<td>Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.</td>
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<tr>
<td>Mar. 30, Mon. 8-9 a.m.</td>
<td>Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.</td>
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<tr>
<td>Mar. 30, Mon. 9 a.m. - 6:30 p.m. 7-9:30 p.m.</td>
<td>Registration by appointment of returning Graduate credit students.</td>
</tr>
<tr>
<td>Mar. 30, Mon. 9-11:30 a.m.</td>
<td>Registration by appointment of returning Undergraduate credit students.</td>
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<tr>
<td>Mar. 31, Tues.</td>
<td>Registration of any eligible returning Undergraduate credit students not registered.</td>
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<tr>
<td>Apr. 1, Wed. 8:00 a.m.</td>
<td>Classes begin for Spring Quarter.</td>
</tr>
<tr>
<td>Apr. 3, Fri. 6-8 p.m. &amp; Apr. 7, Tues. 4-6 p.m.</td>
<td>Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.</td>
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</table>
Apr. 7, Tues.       Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Spring Quarter!

Apr. 28, Tues.     Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

May 25, Mon.       Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

May 25-29 Mon.-Fri. Educational counseling and student advisement for the Summer and Fall Quarters.

June 9, Tues.      Classes end for Spring Quarter.

June 11, Thurs.    All grades due in Registrar's Office.

June 14, Sun.      Commencement Exercises

SUMMER QUARTER 1970

May 12, Tues.      Last day for receipt of applications for regular admission to Summer Quarter.

May 13-June 2 Wed.-Tues. Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.

June 15, Mon.      Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.

June 16, Tues.     Registration by appointment of returning Undergraduate credit students.

            3:30-9:30 p.m. Registration by priority number of new freshmen and transfer students.

June 17, Wed.     Classes begin for Summer Quarter.

June 19, Fri.      Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.

June 23, Tues.
June 23, Tues.  Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Summer Quarter!

July 14, Tues.  Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

Aug. 10, Mon.  Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

Aug. 10-14 Mon.-Fri.  Educational counseling and student advisement for Fall Quarter.

Aug. 21, Fri. 9:30 p.m.  Classes end for Summer Quarter.

Aug. 25, Tues. 12:00 Noon  All grades due in Registrar's Office.

FALL QUARTER 1970

Aug. 21, Fri.  Last day for receipt of applications for regular admission to Fall Quarter.

Aug. 24-Sept. 11 Mon.-Fri.  Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.

Sept. 14-18 Mon.-Fri.  Orientation and advisement for new freshmen and transfer students not pre-advised.

Sept. 21-22 Mon.-Tues.  Advisement of returning students not pre-advised.

Sept. 22, Tues. 6-8 p.m.  Registration by appointment of Graduate credit students.

Sept. 23, Wed. 8 a.m.-6:30 p.m. 7-9:30 p.m.  Registration by appointment of returning Undergraduate credit students.

Sept. 24, Thurs. 8 a.m.-6 p.m.  6:30-9 p.m.  Registration by appointment of new part-time Undergraduate credit students.

Sept. 25, Fri. 8-12 Noon  Registration by appointment of new full-time Undergraduate credit students and any students not yet registered.
Sept. 28, Mon.
8:00 a.m.
Classes begin for Fall Quarter.

Sept. 29, Tues.
6-8 p.m.
Late Registration (for late applicants and Temporary Students).
All full-time students will be assessed a $25.00 Late Fee.

Oct. 2, Fri.
4-6 p.m.
Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Fall Quarter!

Oct. 23, Fri.
Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

Nov. 26-27
Thurs.-Fri.
Thanksgiving holidays.

Nov. 30, Mon.
8:00 a.m.
Classes resume.

Nov. 30-Dec. 4
Mon.-Fri.
Educational counseling and schedule advisement for Winter Quarter (for currently-enrolled students).

Nov. 30, Mon.
Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

Dec. 11, Fri.
9:30 p.m.
Classes end for Fall Quarter.

Dec. 14, Mon.
12 Noon
All grades due in Registrar's Office.

Dec. 14, Mon.
12 Noon
Christmas holidays begin.

WINTER QUARTER 1971

Dec. 4, '70, Fri.
Last day for receipt of applications for regular admission to Winter Quarter.

Dec. 7-18, '70.
Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.

Jan. 4, Mon.
Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.
Jan. 4, Mon. 8-9 a.m. Registration by appointment of returning Graduate credit students.

9 a.m.-6:30 p.m. Registration by appointment of returning Undergraduate credit students.

7-9:30 p.m. Registration of any eligible returning Undergraduate credit students not registered.

9-11:30 a.m. Registration by appointment of new Undergraduate credit students.

Jan. 5, Tues. 8-9 a.m. Classes begin for Winter Quarter.

Jan. 6, Wed. 8:00 a.m. Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.

Jan 7, Thurs. 6-8 p.m. & Jan. 12, Tues. 4-6 p.m. Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Winter Quarter!

Feb. 2, Tues. Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

Mar. 1-5 Mon.-Fri. Educational counseling and schedule advisement for Spring Quarter.

Mar. 3, Wed. Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

Mar. 18, Thurs. 9:30 p.m. Classes end for Winter Quarter.

Mar. 19, Fri. 3:00 p.m. All grades due in Registrar's Office.

SPRING QUARTER 1971

Mar. 5, Fri. Last day for receipt of applications for regular admission to Spring Quarter.

Mar. 8-19 Mon.-Fri. Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.
Mar. 23, Tues. Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.

Mar. 24, Wed. Registration by appointment of returning Graduate credit students.
6-8 p.m.

Mar. 25, Thurs. Registration by appointment of returning Undergraduate credit students.
8 a.m.-6:30 p.m.
7-9:30 p.m.

Mar. 26, Fri. Registration of any eligible returning Undergraduate credit students not registered.
8-9 a.m.
9-11:30 a.m. Registration by appointment of new Undergraduate credit students.

Mar. 29, Mon. Classes begin for Spring Quarter.
8:00 a.m.

Mar. 30, Tues. Late Registration (for late applicants and Temporary Students).
6-8 p.m. & All full-time students will be assessed a $25.00 Late Fee.
Apr. 2, Fri. 4-6 p.m.

Apr. 2, Fri. Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Spring Quarter!

Apr. 9, Fri. Easter holiday.

Apr. 12, Mon. Classes resume.
8:00 a.m.

Apr. 26, Mon. Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

May 26, Wed. Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.

May 24-28 Educational counseling and student advisement for the Summer Mon.-Fri. and Fall Quarters.

May 31, Mon. Memorial Day holiday (under the 1968 Uniform Monday Holiday Act).

June 1, Tues. Classes resume.
8:00 a.m.

June 9, Wed. Classes end for Spring Quarter.
9:30 p.m.
June 10, Thurs.  3:00 p.m.  All grades due in Registrar's Office.


SUMMER QUARTER 1971

May 13, Thurs.  Last day for receipt of applications for regular admission to Summer Quarter.

May 14-June 3  Persons filing applications during this period may, if accepted, be required to register during the Late Registration Period. Students applying after this date may be admitted as Temporary Students and must register during one of the Late Registration Periods.

Fri.-Thurs.

June 14, Mon.  Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.

June 16, Wed.  Registration by appointment of returning Undergraduate credit students.

8 a.m.-3:30 p.m.

3:30-9:30 p.m.  Registration by priority number of new freshmen and transfer students.

June 17, Thurs.  Classes begin for Summer Quarter.

8:00 a.m.

June 21, Mon.  Late Registration (for late applicants and Temporary Students). All full-time students will be assessed a $25.00 Late Fee.

6-8 p.m. &

June 24, Thurs.  Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Summer Quarter!

4-6 p.m.

June 24, Thurs.  Last day to adjust class schedule (end of Add-Drop Period). Last day to make application for graduation for students who will complete requirements at end of Summer Quarter!

July 5, Mon.  Independence Day holiday.

July 6, Tues.  Classes resume.

8:00 a.m.

July 16, Fri.  Deadline for withdrawal without penalty. Last day for removing Temporary Student status.

Aug. 13, Fri.  Last day a student may withdraw from a course or from the University. Last day a student may change from Credit to Audit, if passing.
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</tr>
<tr>
<td>12 Noon</td>
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</table>
DEGREE REQUIREMENTS

The University graduation requirements must be met by each student who wishes to receive a degree from Florida Technological University.

To meet minimum bachelor degree requirements, all students must complete at least 183 quarter credit hours with a minimum average of "C" for all courses attempted (both FTU and transfer). At least 72 quarter hours must be from courses numbered 300 or above.

A student has the option of graduating under any single FTU University Bulletin in force during his most recent continuous attendance. He may not use a combination of Bulletins to fulfill degree requirements. Should his attendance be interrupted, he must meet the requirements of the Bulletin under which he has been readmitted. (Summer quarters are not included in determining interrupted attendance.)¹ A junior college graduate may elect to use the FTU Bulletin in force at the beginning of his most recent continuous attendance at the junior college.

Senior students must take the Graduate Record Examination (GRE) prior to graduation.²

DEGREES OFFERED

The University offers the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Science in Business Administration, Bachelor of Science in Engineering, and Bachelor of General Studies. These degrees are available in the following Colleges, with majors and options or areas of concentration as indicated:

I. Bachelor of Arts (B.A.)

College of Education

Major: Elementary Education
Major: Secondary Education
Specializations: Biology, Business Education, Chemistry, English, Foreign Languages, Mathematics, Physical Education, Physics, Social Sciences

¹ See General Requirements — page 52.
² Steps in the Graduation Process — page 59.
College of Humanities and Social Sciences

Majors: Art, Communications (emphasis in Journalism, Radio-Television, Speech, and Theatre), Economics, English, Foreign Languages (French and Spanish only), History, Humanities, Music, Political Science, Psychology, Sociology

II. Bachelor of Science (B.S.)

College of Engineering

Major: Physics

College of Natural Sciences

Majors: Biological Science (with options in Biology, Botany, Microbiology, and Zoology), Chemistry, Computer Science, Inhalation Therapy, Mathematics, Medical Records Science, Medical Technology, and Statistics.

III. Bachelor of Science in Business Administration (B.S.B.A.)

College of Business Administration

Major: Business Administration, with areas of concentration in Accountancy, Business Administration, Economics, Finance, Management, Marketing, Transportation

IV. Bachelor of Science in Engineering (B.S.E.)

College of Engineering

Major: Engineering, with areas of concentration in Civil Engineering and Environmental Sciences, Electrical Engineering and Communication Sciences, Engineering Materials Sciences, Industrial Engineering and Management Systems, Mechanical Engineering and Aerospace Sciences plus other interdisciplinary areas such as Biomedical Engineering, Engineering Design, Engineering Operations, Engineering Physics, Systems Engineering

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V. Bachelor of General Studies (B.G.S.)

Offered through the office of the Vice-President for Academic Affairs.¹

TEACHER CERTIFICATION FOR STUDENTS NOT ENROLLED IN THE COLLEGE OF EDUCATION

Students who wish to major in the Colleges of Business Administration, Engineering, Humanities and Social Sciences, or Natural Sciences and receive teacher certification must successfully complete both the professional education requirements and teaching specialization requirements as specified in the College of Education Career Teaching Program.

¹See General Studies — page 67.
"The Individual Student at F.T.U. is the Center of Attention. There is a Very Favorable Faculty-Student Ratio of 1-15."
FLORIDA TECHNOLOGICAL UNIVERSITY

STATEMENT OF PURPOSE

Florida Technological University has been established as a state university to provide educational opportunities to the people of the State of Florida through teaching, research, and service. As one of the nine public universities in the State, Florida Technological University is basically a general purpose institution of higher learning. In fulfilling this role, it offers baccalaureate degrees in business administration, education, engineering, humanities and social sciences, and natural sciences and mathematics. Selected graduate courses at the master's level are offered in business administration and education to part-time on-campus students. Continuing education courses are offered off campus to the citizens of the East Central Florida Region consistent with the assigned responsibility of the institution.

In addition to its general purpose role, Florida Technological University has a specific role to fulfill which contributes to its uniqueness as one of the public universities within the State. This is in emphasizing the development of teaching and research programs in the various technologies and in experimenting with new ways of perceiving academic concerns from a technological point of view.

STATEMENT OF PHILOSOPHY

The philosophy of the University has two basic tenets: first, an ACCENT ON THE INDIVIDUAL, and second, an ACCENT ON EXCELLENCE. In view of the growing concern about the loss of individual identity in today's environment, Florida Technological University is indicating its attitude toward the individual worth of the student, his vitality, his character, and his development by placing an ACCENT ON THE INDIVIDUAL. The campus master plan has been designed to encourage face-to-face communication between students and faculty. One objective of this plan, called the "Village Concept," is to maintain a small college atmosphere in each of five villages while at the same time providing educational and enrichment opportunities normally available only in a large university setting. Realizing that some of tomorrow's leaders will come from today's students, the University's accent is not only the individual but also on THE RESPONSIBLE INDIVIDUAL.
With an ACCENT ON EXCELLENCE, Florida Technological University provides an academic program for each individual student. Programs and courses have been developed to:

Develop the student's intellectual capacities so that he may have a better understanding of his present environment, the knowledge of his inheritance from past civilizations, and a basis for anticipating and mastering the conditions of his future.

Refine and intensify the student's powers of thinking and judgment necessary to stimulate his intellectual advancement and to establish him as a productive member of society.

Strengthen the student's awareness of the privileges and responsibilities of citizenship in a democracy.

Excite the student's intellectual interests and encourage him to continue to seek knowledge throughout his adult life.

Offer the student an opportunity to prepare for a profession and to develop competence in his chosen field—the pivot from which to expand his horizons in all areas of life.

It is our hope that each individual student will join with the others of the university community in striving not just for expansiveness in thought and action but also for excellence. While broadening our horizons, we must not forget to look upward and in seeking perfection, "Reach for the Stars".

MASTER PLAN FOR THE CAMPUS

The campus of Florida Technological University consists of 1,227 acres of land, much of which is covered with handsome pine, palm, cypress, cedar, and oak trees. Lakes and ponds contribute to the natural beauty of the campus. Lake Claire covers approximately forty acres and Lake Lee encompasses about fourteen acres. While the campus is in the process of development, every effort is being made to preserve and enhance the natural beauty of the site.

The Village Concept on which the University's campus master plan is based is so new that there are only a few in existence. In fact, the Florida Technological University village plan is unique. The present plan envisions a circle within which will be located all of the buildings and other facilities
needed during the first ten years of the life of the University. The central core of the campus will contain the general and specialized academic buildings, such as the library-Learning Resources Center and Science Buildings. Closely related academic disciplines will be clustered together for identity and convenience. In close proximity to and radiating from the central core of the campus in a concentric circle will be the separate student communities called "villages."

Among other facilities, plans call for each village to contain residence halls, a village (student) center, an infirmary, and a physical education recreation area. Five villages are planned during the first ten years, each one designed to serve about 3,000 students. The Village Concept will assist the University in maintaining a small college atmosphere for each student while at the same time providing the student with the educational and enrichment opportunities available only in a university setting.

Growth and progress are two pertinent words today as FTU expands into a dynamic and ever-changing institution of quality higher education. The Fall of 1969 should see the student enrollment expand from the first year figure of about 1,500 to an expected student body of 3,000. In five years, the student body is expected to reach 10,000 and 15,000 by 1977. Experts now predict that by 1980 the student body will approximate 25,000.

Not only is the student body expanding, but the faculty which numbered 97 during the first year of operations will stand at 175 by the start of classes in 1969. By 1978, the faculty is expected to number around 870.

The University opened in 1968 with the first phase of construction representing an investment of about $8.9 million which included the first phase of the Village Center (Student Union), the Library Building, Science Building and Science Lecture Hall, four Residence Halls and a utilities complex large enough to serve the needs of a small city.

Construction on the second phase of buildings at FTU is well under way. It represents a value of approximately $6.5 million in modern functional structures of which the 31 classroom General Purpose Classroom Building is scheduled for occupancy at the beginning of the fall term. By 1970, the Administration/Classroom Building and Science/Technology/Data Processing Buildings are scheduled for completion.

THE CAMPUS IN 1969-70

A winding road lined with oak and pine trees leads from the main entrance to the heart of the campus, terminating at the Library Building.
This imposing five-story building serves a multitude of purposes. In addition to housing the library, it also temporarily contains general classrooms, the data processing center, the language laboratory, office space for the faculty, and administrative offices.

Just a short distance from the Library Building is the Science Building. This structure, containing classrooms, faculty offices, and teaching and research laboratories, accommodates all of the biological and physical sciences activity. The Science Lecture Hall, seating 320 persons, adjoins the Science Building.

The Village Center, commonly referred to on other campuses as the "student center" or the "student union," is the focal point of much student activity on the campus. Included in the Village Center are food service facilities, indoor recreational areas and equipment, offices for student organizations, the infirmary, and the Department of Music.

The University has residence facilities available for 432 students. These facilities consist of four interrelated residence halls, each of which houses 108 students. Two of the double story residence halls are for men students; the other two accommodate women students. Students live in suites composed of a bedroom-study area, a living room, and a bath. Included in the suite pattern are single rooms for 48 students; all other rooms are designed to accommodate two students.

The outdoor recreational facilities are designed to accommodate the physical education academic programs, the organized intramural program, and the informal recreational activities.

THE EAST CENTRAL FLORIDA AREA

The University is located in the center of the dynamic East Central Florida region of the State. This area is well endowed with a rich heritage of educational, cultural, industrial, and recreational activities.

The public school systems of the area have experienced rapid growth in recent years while maintaining high-quality programs. The several privately supported colleges and public junior colleges have served the higher educational needs of Central Florida, the State, and the Nation for a number of years. Florida Technological University became a part of this group in September of 1968.

The arts flourish in East Central Florida. About 297,000 library volumes are shelved in the new Orlando central public library and its eight branches. The Florida Symphony Orchestra, located in Orlando, was the
first all-professional symphony orchestra in the State. Each year it presents subscription concerts, as well as pop and children’s concerts. For the past three years, the Summer Music Festival in Daytona Beach has featured the London Symphony Orchestra. There are several art galleries and museums in the area, as well as wide participation in the annual Winter Park Sidewalk Art Festival. Housing one of the South’s few planetariums, the Central Florida Museum and Planetarium presents celestial shows and exhibits and displays, many of them with a space-age orientation. Several theater groups are active in the area.

Business, industry, and finance in this area have experienced considerable expansion in recent years. Much of this growth in East Central Florida has been in the “technical” industries, including electronics, aircraft, missiles, and scientific instruments. The location of the John F. Kennedy Space Center, NASA, about 25 miles east of the campus site, accounts for a significant amount of the economic activity in both technical and non-technical industries. Agri-industry makes a significant contribution to the area’s economy. It is based principally on citrus and truck crops. The area is a manufacturing and distribution center for consumer products for the entire State. Central Florida is also expanding as a Regional insurance center.

Recreational and entertainment activities are both varied and numerous. Since it is located near the center of the State and is a crossroads for several major highways, this area either includes or is close to many of the educational, cultural, and tourist attractions of Florida. For example, Daytona Beach, St. Augustine, and Cypress Gardens are within short driving distance of the campus. Regularly scheduled tours make it easy to visit the Kennedy Spaceport, “Gateway to the Moon.”

Sports enthusiasts will appreciate the many opportunities for boating, fishing, and swimming. Orange County alone provides several parks open to the general public. Orlando fields its own professional football team—the Orlando Panthers of the Continental Football League—and is the spring headquarters for the American League Minnesota Twins baseball club, as well as the home of the Class A Orlando Twins.

This section of the Bulletin would not be complete without a description of the plans for Florida Disney World. This huge complex is being built approximately 15 miles southwest of Orlando; 43 square miles of land have already been acquired and preliminary work is well under way at the site. Disney World will include as its major features:

A. A Theme Park. Similar to Disneyland in California, but considerably larger, the Theme Park is expected to open in
Walt Disney World Opening October 1971 ©Walt Disney Productions

Neil Armstrong's Moon Walk July 1969 * NASA
October of 1971. Adjoining the Theme Park will be hotel, motel, recreational, and entertainment facilities for the entire family.

B. An Industrial Park. In the 1,000-acre Industrial Park, the Disney staff will work with individual corporations to create a showcase of industry at work. This facility also will provide employment for many residents of Disney World.

C. EPCOT (The Experimental Prototype Community of Tomorrow). Since EPCOT will depict urban life 25 years into the future, it will never be complete, but will always be introducing, testing, and demonstrating new ideas and new technologies. EPCOT is designed to serve an initial population of 20,000.

The estimated 1966 population in the East Central Florida region was about 924,400 and is projected for 1,286,700 by 1972. The estimated rate of increase of population from 1966 to 1970 for this area stands at 24.2%.

ACCREDITATION

The University is a candidate for membership with the Southern Association of Colleges and Schools and is working closely with the Association in pursuit of accreditation and membership at the earliest possible time.

FTU is listed in Report of Credit Given By Educational Institutions, 1969 (page 23) with an “A” Rating. An A rating means “Transcript of record given full value.” This handbook published by the American Association of College Registrars and Admission Officers shows the acceptability of transfer credits based upon their (AACRAO) evaluation.

FLORIDA TECHNOLOGICAL UNIVERSITY FOUNDATION

The Florida Technological University Foundation, Inc., has been established to provide funds and services not available through State appropriations or fees. The Foundation assists the financial aid program, scholarship program, as well as institutional development.

The Foundation has also made available a limited number of short term loans for emergency purposes. Information concerning the FTU Foundation sponsored financial aid may be obtained from the Director of Student Financial Aid, Office of Student Affairs.
STUDENT AFFAIRS

INTRODUCTION

The Vice President for Student Affairs is concerned with the education and welfare of students as affected by non-classroom aspects of the total University program; therefore, he coordinates and supervises the non-academic areas of student life. His goals include creation of a favorable environment for student learning; personalization of the educative process; encouraging self-discipline, self-direction and purpose on the part of the individual student; and fostering respect and brotherhood among students and faculty. Assisted by members of his staff, the Vice President for Student Affairs administers programs involving orientation, personal counseling, housing, financial aids, health services, student government, and special activities. Students are invited to consult the staff of Student Affairs concerning any aspect of campus life.

ORIENTATION

The purpose of orientation at Florida Technological University is to acquaint new entering and transfer students with the various colleges and academic curricula and to assist them in understanding college life. Orientation for the student begins at the time he indicates he wishes to enroll in FTU. He will receive a number of communications from members of the faculty and administration, and subsequently from the student body, advising him on academic life, student services, and other campus activities. The student will be advised by mail when to report for orientation during which he will personally meet members of the faculty and administration and receive instructions and information to facilitate his registration. Additionally, a separate orientation for students’ parents will feature a member of the academic faculty and a representative of the Office of Student Affairs to answer questions on academic matters and student life.

HOUSING POLICY

1. Regularly enrolled single undergraduate students paying the registration fee for full-time attendance and who are not residing with their parents or legal guardian are required to live in University residential units to the extent that facilities are available. Under the quarter system, regular enrollment is interpreted as seven or more hours. Priority for final assignment is given to those students admitted in good standing.
II. Unless otherwise announced, students will be permitted to live in off-campus accommodations if they are 21 years of age by 1 October of the first quarter; 1 January of the second quarter; 15 March of the third quarter; and 1 June of the fourth quarter. Those students who become 21 years of age while in residence must complete their current housing contract.

III. Students not living with parent or guardian will be permitted to live in off-campus accommodations if they meet any one of the following qualifications:

(a) Married student living with spouse
(b) Enrolling for less than seven hours
(c) Living with adult relatives with the written approval of parent or guardian.

IV. Applications for exemptions to the above are to be directed to the Dean of Men or Dean of Women.

V. The above policy does not apply to part-time evening students who are employed in full-time positions.

HOUSING AND FOOD SERVICES

Each applicant submits, as a part of the admissions procedure, a housing declaration form on which he may request a housing and food service contract. The priority for room reservation is based upon the date of receipt of the application for admission accompanied by the housing declaration or subsequently by the date of receipt of a written request for housing.

ALL CONTRACTS ARE FOR ROOM AND BOARD. Two boarding plans are available. A 21-meal plan provides three meals per day, seven days per week; a 15-meal plan provides three meals per day, five days per week Monday through Friday.

STUDENT HEALTH SERVICES

The University is concerned with the physical and emotional health of the student as well as the promotion of individual and general health in the University community. A health service will be maintained on an out-patient basis for routine and emergency health needs, to promote health education, and to protect the student body from communicable diseases. A physician, as well as specialists, will be available on an on-call
basis and a staff of nurses will be on duty most hours. Medical care in the student's living quarters is not provided. A student health insurance program is in effect for full-time students; however, participation is optional for part-time students.

It is not compulsory for the student to use the services of the Health Service in case of illness or injury, except in matters of public or campus health. The right of the student to choose his own source of medical care will be recognized. Medical records are considered privileged communications and will not be released without the student's consent, except when information essential to public health is involved.

STUDENT FINANCIAL AID SERVICES

The Student Financial Aid program is designed to assist any qualified student to attend the University regardless of financial need. The basic presupposition of the University is that the student and his family have the primary responsibility for meeting the educational costs. It is the task of the Office of Student Financial Aid to work with the family and the student in preparing a reasonable and realistic financial program. The University also assumes that the family will make long-range preparation to finance the student's education.

While need is the basic factor in arranging any program, other considerations may also include an evaluation of the total profile of the student's past record.

Student Financial Aid may involve one or more of the three basic forms of assistance: scholarships and grants; loans; employment opportunity. These programs are available to full-time students who have proven financial need.

Making Application for Aid

To apply for aid the student should follow the three basic steps:

(1) File a copy of the Application for Student Financial Aid. This is available on request by writing to the Director of Student Financial Aid.

(2) File a copy of an approved financial statement with the College Scholarship Service. In most cases this means the Parents' Confidential Statement. Fully independent students should write to the Director of Student Financial Aid to see if
they qualify for a different form. Remember that it may take several weeks for this form to be processed and returned to the University.

(3) Be accepted for admission. No award is made to a student until the Office of Admissions notifies the Office of Student Financial Aid that the student has been accepted in good standing.

**Student Financial Aid Deadlines**

The deadline for initial applications is April 15. Applications will be accepted later than that date but will have no priority since all funds could have been committed. Students receiving aid must apply annually for the renewal of that aid. This requires filing a copy of the Renewal Form of the Parents' Confidential Statement or its approved equivalent and a copy of the Application for Renewal of Student Financial Aid. The deadline for all renewal applications is March 1.

**Estimating the College Budget**

The Office of Student Financial Aid is concerned with the total expense of a college education. It has, therefore, established an estimated college budget for the “average” student as a resident or commuting student. In estimating need, consideration is made between the contribution from the family and student and the estimated expenses listed below.

<table>
<thead>
<tr>
<th>ESTIMATED COLLEGE BUDGETS FOR THREE QUARTERS*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resident Living On-Campus</strong></td>
</tr>
<tr>
<td>Registration and fees</td>
</tr>
<tr>
<td>Books and supplies</td>
</tr>
<tr>
<td>Room and food</td>
</tr>
<tr>
<td>Recreation</td>
</tr>
<tr>
<td>Clothing, laundry, etc.</td>
</tr>
<tr>
<td>Personal and miscellaneous</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

| **Commuter**                               |
| Registration and fees                      | $465 |
| Books and supplies                         | 150  |
| Meals on campus                            | 200  |
| Transportation                             | 300  |
| Recreation                                 | 100  |
| Clothing, laundry, etc.                    | 200  |
| Personal and miscellaneous                 | 85   |
| **Total**                                  | $1,500 |

*Non-Florida Residents should add $300 out-of-state tuition per quarter to the above totals.
FORMS OF AID AVAILABLE

Scholarships and Grants

The Educational Opportunity Grant — This grant is available to students from low-income families who might not otherwise be able to attend the University. Its source is the federal government.

Various scholarships — As a new University, FTU is in the process of raising funds for scholarships and grants. The Florida Technological University Foundation has responsibility for seeking these funds. At present, a small number of scholarships are available but it is hoped that in the near future more funds will be given for this purpose. Those presently available are listed below.

The Rossini Scholarship in Music — Given anonymously, this scholarship is awarded to a student in music as an honors award for $100 per year.

The Richmond I. Barge Associates Scholarship in Humanities — This award is for $500 and is available to juniors or seniors with preference going to students majoring in history.

The Martin Marietta Management Club Scholarship — This $500 award was made available to “a worthy student pursuing a business-oriented curriculum.”

The Osburn, Henning and Company Scholarship in Accounting — This award may be made to a junior or senior in the field of accounting. Its value is $500.

The Beardall Scholarship — This award is available to students of proven academic ability with financial need. The scholarship derives from the income of $10,000 gift from the William Beardall Foundation.

The Allstate Insurance Scholarship — This award of $100 per year is made available by the Allstate Insurance Company.

The East Orange Rotary Club Scholarship — This award provides tuition costs to a student of outstanding academic ability and proven financial need.

Loans

The National Defense Student Loan — One of the federal government’s student aid programs, the National Defense Student Loan is a deferred
payment loan which accrues no interest and requires no repayment until the student has graduated or withdrawn from school. Thereafter, it carries a 3% simple interest rate. Regulations limit this loan to a maximum of $1,000 per year.

The Federally Insured Loan – This loan is negotiated through approved banks, savings and loan associations, credit unions and other lending agencies. Undergraduates may borrow up to $1,000 for three quarters of academic work. Applications and further information may be secured from any lending institution participating in the program.

The Florida Student Loan – These deferred payment loans are made available from the State of Florida and must be renewed annually. The interest rate following graduation is 4%. This loan is limited to Florida residents.

The Colleen Rhea Brown Memorial Scholarship Loan Fund – This award has been established to the memory of the late Colleen Rhea Brown who was one of the first employees of Florida Technological University. This was the first scholarship to be established at FTU and is available to women of junior or senior classification majoring in secretarial science or business education.

The Dr. P. Phillips Foundation Loan Fund – This fund provides loans to students preparing for careers in the scientific fields. During the 1969-70 academic year, $1,000 will be available for loans to qualified students.

University Short Term Loans – A limited number of short-term loans have been provided by the Florida Technological University Foundation. These loans are available at the beginning of a quarter and must be repaid before the end of the quarter. Due to the limitation of funds the maximum amount for a loan is $150.00. There is a 2% service charge made on each loan.

Employment Opportunities

The College Work-Study Program – Funds for this program are provided by the federal government to provide employment for students with financial need. Under this program, work is limited to a maximum of 15 hours per week during the school year. When classes are not in session, students may work up to 40 hours per week, when work is available.

University Employment – Priority for all on-campus employment is given to students on the College Work-Study Program. Some jobs,
however, are available to other students. Application may be made in the Office of Student Financial Aid.

Off-Campus Employment – Orlando area firms often contact the Office of Student Financial Aid when part-time employees are needed. Lists of available jobs are retained in the Office of Student Financial Aid and posted on bulletin boards.

PLACEMENT SERVICES

Career planning, campus interviews, and employer contacts are essential aspects of Placement Services. The provision of these services, however, requires the development of student personnel files and resumes as well as the accumulation of an extensive amount of information pertaining to job opportunities in business, industry, government, education, etc. Both career planning and job placement are facilitated through early student contacts with Placement Services.

All senior students are required to register with the Placement Service and may avail themselves of the opportunities provided. All inquiries should be directed to the Director of Placement.

DEVELOPMENTAL CENTER SERVICES

The Developmental Center offers a professional staff of counselors to guide students in selecting vocational and educational objectives and in overcoming study difficulties and problems of personal and social adjustment. A full range of testing services is provided, along with an educational library, an occupational library and a developmental reading and speech and hearing service.

Any student may request the assistance of the Center whenever he feels the need for increased understanding of himself and of his relationship with others in order to gain additional confidence and satisfactory learning experiences. Diagnostic procedures may include administration of tests to assist in the process of helping a student evaluate his own interests, aptitudes and abilities. After objective and personal data have been compiled, the student is assisted in a systematic exploration of his strength and weaknesses. The services of the Center are voluntary and all aspects of counseling are confidential.

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STUDENT ACTIVITIES

Student leadership may, in part, be enhanced and developed through informed, experienced, dedicated University and community participation. Frequently, activities are referred to as "extracurricular" but at Florida Technological University, student activities are regarded as a part of the total educational program, a supplement to the individual student's academic program. The University, through student cooperation and with the assistance of student organizations, will sponsor a variety of cultural and entertainment programs which will contribute to the student's academic, recreational, and cultural activities. Additionally, he will be provided ample opportunity to become a member of occupational, professional, social, and honorary organizations. The student will play an important role in organizing student organizations within the framework of the University to enhance his personal development. It is the desire of the University to appeal to the individual student's interest and provide him an opportunity to become acquainted with his fellow students and faculty members.

STUDENT GOVERNMENT

The purpose of the Student Government at Florida Technological University is to actively represent student opinion; advance the cause of students both socially and academically; promote communication, cooperation and understanding among students, faculty, and administration; suggest improvements necessary for the welfare of the students; and to insure that Student Government shall continue to be used as a democratic instrument of change at FTU.

The Student Government of FTU represents the interests of students through its executive, legislative, and judicial branches. There are representatives from every college and class in the Senate. In addition to these elected offices, there are many openings available for appointed offices or on Student Government Committees. By active participation in Student Government, or by voicing his opinions and ideas through his legislators, the student gains valuable experience in the democratic processes — its freedoms and responsibilities. Students interested in working with the Student Government may obtain information from the Student Government Office in the Village Center, any Government member, or from the Office of Student Affairs.
VILLAGE CENTER

The center of student life on the Florida Technological University campus is the Village Center, a campus-community facility serving students, faculty, University patrons, alumni and guests. It contains food service facilities, conference rooms, and lounge areas where the student may relax during his leisure moments. Offices for Student Government, the newspaper, the yearbook, Village Center Student Activities and other student organizations are located in the Village Center. Under the administration of the Director of the Village Center, many student activity programs are conducted for the social, cultural and recreational interests of all students.

INTRAMURAL SPORTS PROGRAM

The Intramural Sports Program affords many opportunities for the student to participate in a variety of recreational and competitive activities designed to meet the needs and interests of the men and women of the University. Healthful sports, good sportsmanship and friendly competition are stressed. Residence halls, social organizations, clubs and independent groups are the basic units for competition.

Students are encouraged to assist in the planning and execution of the program as well as in the actual participation. Recreational equipment is furnished for many activities and is available upon request.

STUDENT CONDUCT

Students are subject to federal and state laws and local ordinances as well as regulations prescribed by Florida Technological University and the Florida Board of Regents. The breach or violation of any of these laws or regulations may result in judicial or disciplinary action.

When a student is involved in an offense resulting in criminal charges, the circumstances of the case may be reviewed by the appropriate Student Affairs Committee to consider the student’s status at the University as well as eligibility for extracurricular activities. When the welfare of the individual, the Student Body, or the University indicates the necessity of prompt decision, immediate administrative action may be taken without convening the Committee. If circumstances warrant, the case may be presented to the Committee as soon as possible thereafter for approval or possible change.
COLLEGE EXPENSES

A student's basic expenses at the University will be for tuition fees, room and board, textbooks, other instructional supplies, and miscellaneous items.

STUDENT COSTS

Required fees are established by the Board of Regents and the Florida State Legislature and are subject to change without notice.

It is required that all University fees be paid at or before regular registration time. University policies do not permit deferring fees or paying by installments during the quarter.

The following schedule applies to all Florida Technological University students:

General Fees and Costs

A. Application fee (required with all applications for admission to the University and not refundable) ................. $ 10.00

B. Registration Fees (per quarter)

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th></th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On—Campus Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time (7 hours or more)</td>
<td>$150.00</td>
<td>$450.00</td>
</tr>
<tr>
<td>Part-time (6 hours or less)</td>
<td>$ 14.00 per hour</td>
<td>$ 39.00 per hour</td>
</tr>
<tr>
<td><strong>Off—Campus Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuing Education</td>
<td>$ 17.00 per hour</td>
<td>$ 42.00 per hour</td>
</tr>
</tbody>
</table>

C. Registration Fees (per quarter)

<table>
<thead>
<tr>
<th>Graduate</th>
<th></th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On—Campus Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time (7 hours or more)</td>
<td>$175.00</td>
<td>$475.00</td>
</tr>
<tr>
<td>Part-time (6 hours or less)</td>
<td>$ 16.00 per hour</td>
<td>$ 41.00 per hour</td>
</tr>
<tr>
<td><strong>Off—Campus Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuing Education</td>
<td>$ 19.00 per hour</td>
<td>$ 44.00 per hour</td>
</tr>
</tbody>
</table>

For purposes of assessing fees, a full-time student is an individual who registers for a minimum of seven (7) quarter hours.

*To determine Florida residence requirements, see pages 49 & 50.
D. Room and Board (required of students living in University residence halls) per quarter ............ $273.00-$340.00

Charge for late payment ....................... $ 15.00

E. Books and Supplies (estimated) per quarter .......... $ 50.00

F. Late Registration (for students who register after the time provided under the academic calendar.) ............ $ 25.00

G. Graduation Fee ................................ $ 25.00

H. Applied Music Fee (required for certain music courses)$ 25.00

I. Vehicle Registration (required of all students, faculty and staff operating a motor-powered vehicle on-campus) per calendar year for full time, part time students, and courtesy students from other institutions ............................................. $  2.00

J. Registration for Cooperative Education ............. $ 28.00

Special Fees

A. Transcript Fee (initial request for up to two transcripts issued free of charge, additional requests will be charged) per transcript..............................$  1.00

B. Credit by Examination Fee (required of students taking comprehensive examination for credit of coursework) ....$  5.00/cr.hr.

C. Towel Laundry Fee (required for physical education enrollee) per quarter.................................$  2.00

Student Deposit Fee

At the student’s first registration, every full-time student is required to pay a refundable deposit of $15.00 to cover laboratory breakage and small miscellaneous charges. The student will be required to maintain his deposit at a minimum of $5.00 and will not be billed during the enrollment period except when the deposit falls below this amount. If the deposit falls below the minimum before the end of attendance at the University, the student will be notified by the University Cashier to bring his deposit up to $15.00. Failure to comply will deny the student the privilege to register.
If a student officially withdraws or graduates from the University, the Cashier's Office will be notified by the Registrar to refund the deposit. All deposits will be refunded by check within 30 days after withdrawal or graduation application has been made. If the student has registered on a full-time basis, the deposit will be extended for that period.

Checks

The University will accept personal checks for accounts due the University. Each student is urged to make his own financial arrangements through his choice of commercial banks. The University Cashier and the Bookstore will cash personal checks not exceeding $50.00. A $5.00 handling fee will be charged for each returned check.

Refund of Fees

A refund of fees will be made under certain conditions upon presentation at the Cashier's Office of a certification of withdrawal issued by the Registrar.

<table>
<thead>
<tr>
<th>Cancellation or Withdrawal</th>
<th>Registration Fee</th>
<th>Out-of-State Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Undergraduate</td>
<td>Graduate</td>
</tr>
<tr>
<td>Prior to the first day of classes</td>
<td>$150</td>
<td>$175</td>
</tr>
<tr>
<td>Prior to end of late registration period</td>
<td>120</td>
<td>145</td>
</tr>
<tr>
<td>After close of late registration</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

EXCEPTIONS: A full-time student involuntarily called to active duty with the armed forces, or who contracts an incapacitating illness of such duration and severity as to prevent the successful completion of the academic program for the term enrolled will be refunded fees on the following schedule:

<table>
<thead>
<tr>
<th>Period Ending:</th>
<th>Registration Fee</th>
<th>Out-of-State Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Undergraduate</td>
<td>Graduate</td>
</tr>
<tr>
<td>During 1st week of classes</td>
<td>$120</td>
<td>$145</td>
</tr>
<tr>
<td>During 2nd week of classes</td>
<td>100</td>
<td>125</td>
</tr>
<tr>
<td>During 3rd week of classes</td>
<td>80</td>
<td>105</td>
</tr>
<tr>
<td>During 4th week of classes</td>
<td>60</td>
<td>85</td>
</tr>
<tr>
<td>After 4th week of classes</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

No refunds will be made under this policy except upon proper application. Commensurate refunds will be made to part-time students.

In case of the death of a student anytime during the term of registration, full refund of fees will be made, less $30.

A full refund of music fees will be made if withdrawal is effected on or before the last day of the late registration period.
WHERE TO GO FOR ANSWERS

When in doubt or when you need assistance, consult with the Office of Student Affairs. However, for your convenience and help, some of the offices of the University and some of the problems with which they deal are listed below.

<table>
<thead>
<tr>
<th>Academic Matters</th>
<th>Academic Adviser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Status</td>
<td>Registrar</td>
</tr>
<tr>
<td>Add, Drop, or Change Courses</td>
<td>Registrar</td>
</tr>
<tr>
<td>Admissions, Records, and Transcripts</td>
<td>Registrar</td>
</tr>
<tr>
<td>Books, Supplies, and Sundry Items</td>
<td>University Bookstore</td>
</tr>
<tr>
<td>Borrowing Books from Another University</td>
<td>Library</td>
</tr>
<tr>
<td>Cash a Check</td>
<td>Finance and Accounting</td>
</tr>
<tr>
<td>Check out Phonograph Records</td>
<td>Library</td>
</tr>
<tr>
<td>Credit by Examination</td>
<td>Dean of Appropriate College</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Student Health Service</td>
</tr>
<tr>
<td>Help with Reading, Speech, and Hearing</td>
<td>Developmental Center</td>
</tr>
<tr>
<td>How to Organize a Club</td>
<td>Village Center</td>
</tr>
<tr>
<td>Identification Cards</td>
<td>Registrar</td>
</tr>
<tr>
<td>Intramurals</td>
<td>Student Affairs</td>
</tr>
<tr>
<td>Loans, Scholarships, and Grants</td>
<td>Student Financial Aid</td>
</tr>
<tr>
<td>Lost and Found</td>
<td>Village Center</td>
</tr>
<tr>
<td>Orientation</td>
<td>Student Affairs</td>
</tr>
<tr>
<td>Pay University Bills</td>
<td>Finance and Accounting</td>
</tr>
</tbody>
</table>
The University Library is designed to provide Florida Technological University students maximum service in the pursuit of their education as well as to encourage personal and leisure time reading. The collection now numbers approximately 100,000 volumes, and will be increased by some 25,000-40,000 volumes each year. The library is planned as the center of academic activity on the campus, and all books are placed on open shelves to encourage browsing.

The library operates on a full schedule of hours, including evenings and weekends. During all hours of opening, a well trained staff of professional librarians is on duty to provide reference service to the library's patrons. In addition, instruction in the use of the library and its resources is available to the students.

The Department of Instructional Media, operated in conjunction with the University Library, provides films, tapes, slides, sound recordings and other instructional media for class use and for recreational use. In addition, complete graphic and photographic services are provided to support educational and other programs of the University.
ADMINISTRATIVE & ACADEMIC POLICIES

ADMISSIONS REQUIREMENTS – First-time College & Transfer

Freshman Applicants (First College Attended)

The following classes of applicants will be eligible for consideration as candidates for admission to credit courses. Eligibility is subject to satisfactory receipt and review of all items requested in the admissions process. All applicants must have earned 12 high school academic units (i.e., from the areas of English, foreign language, mathematics, science, or social studies).

Graduates of Accredited Florida High Schools who receive a favorable character recommendation from officials of their high school, have an overall average of “C” or better for all academic subjects, and have earned a minimum score of 300 on the Florida State-Wide Twelfth Grade Test.

Graduates of Accredited High Schools Outside Florida who receive a favorable character recommendation from officials of their high school, have grades placing them in the upper 40 percent of their graduating class, and have acceptable test scores (i.e., 900 or higher on the CEEB/SAT, 21 or higher on the ACT, or 38 or higher on the ACE).

Graduates Possessing a High School Equivalency or a General Education Development (GED) Diploma who have a favorable recommendation from their employer, have an acceptable high school record for the portion attended, and have a minimum individual score (percentile) or 50 and a minimum average of 60 on the GED test. (Note: A USAFI Certificate is not an Equivalency Diploma.)

Graduates Who Meet Requirements in the First Two Categories Above, But Who Have Graduated from a Regionally Unaccredited High School may enter on provisional admission. By obtaining a 2.0 (C) GPA or better at the end of the quarter during which 12 or more quarter hours are attempted, the provisional status shall be removed.

Graduates Who Score Below 300 on the Florida State-Wide Twelfth Grade Test and who have a satisfactory high school performance will be considered for admission assuming the other requirements stated above have been met.
Transfer Applicants

Students transferring to degree programs must have a minimum 2.0 (C) GPA on all college work previously attempted, must be eligible to return to their last previously-attended institution, and must present a satisfactory score on a general ability test. Should the applicant have less than 90 quarter hours of transferrable college credit and not possess a university parallel degree from an approved Florida junior college, he must meet the University’s freshman entrance requirements.

Only credits in which the applicant has achieved a grade of "C" (2.0) or better are transferable.

No credit will be awarded for college-level GED tests, for courses given without a grade, nor for courses carrying grades but not credit hours. However, evidence of satisfactory completion will be posted on the student’s permanent record.

Final determination regarding applicability of credits accepted in transfer toward the fulfillment of degree requirements resides with the College in which a student is enrolled.

Completed service school courses may be evaluated on the basis of the recommendations of the American Council on Education when official credentials have been properly presented. Credit may be granted when courses are equivalent to those offered by the University. However, recommendations by the A.C.E. are not binding upon the University, and application for service school course credit should be made at the time of admission.

Graduates from other accredited four-year institutions who apply for admission to work toward a second undergraduate degree must meet the regular graduation requirements of the University (e.g., See General Regulations for All Undergraduate Degree Students, page 30).

Transfer applicants with incomplete General Education Programs (FTU Environmental Studies Program) from state institutions will be evaluated on an individual basis.

1. Florida State Junior College and University Transfers may satisfy the Basic Environmental Studies Program requirements by completing, prior to transfer, the general education program prescribed by the junior college. This also applies to transfers from state-operated Florida universities.
2. *Private Colleges and Out-of-State Institutions.* The general education programs of transfer applicants from private junior and senior colleges and out-of-state institutions will be evaluated on an individual basis.

3. *Unaccredited Colleges or Universities.* Transfer applicants who otherwise meet all requirements, but who are entering from unaccredited colleges, may enter on provisional admission. By earning a 2.0 GPA or better at the end of the quarter during which 12 or more quarter hours are attempted, the provisional status shall be removed and any credit to be transferred may be validated.

**ADMISSIONS — Provisional**

Students who transfer from an unaccredited high school or college shall be admitted provisionally. Failure to perform satisfactorily will result in the student’s being placed on warning, probation, or disqualification, as his academic record warrants.

**APPLICATION DEADLINE**

Applications for degree credit should be received 30 days prior to the first day of classes for the quarter in which the student wishes to enroll. Candidates whose application has not cleared because of failure to receive supporting documents may be admitted as Temporary Students. Temporary Students are required to register at one of the late registration periods and pay a late registration fee of $25.00

**RECORDS DEADLINE — All Support Documents**

All records requested must be received not later than 15 days preceding the first day of classes, or otherwise the applicant shall be required to register on a temporary basis at a late registration period and pay a Late Registration Fee of $25.00. Records of Temporary Students must be officially received within four weeks (20 class days) from the first day of classes, or the student will be changed to an audit (non-credit) status and no fees will be refunded.

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1 See Records Deadline—All Support Documents, above.
Also, see Fees (Late and Course Change) — page 40.
RECORDS – Validity of Support Documents

All support documents indicated in the Application for Admission must be received directly from the issuing institution, testing agency, or physician.

READMISSION – After Voluntary Withdrawal

Students not in attendance during an academic quarter (exclusive of the summer term) or who withdrew from the University before the end of a quarter (including the most recent quarter), must submit an application for readmission and such other information as may be required. The application must be returned not later than 30 days before the beginning of the quarter of expected attendance.

Any former student who withdrew with a cumulative or overall grade point average of less than 2.0 (C) and who is considered readmissible, will be admitted on academic probation.

TEMPORARY STUDENT – Change to Non-Credit Policy

Any student permitted to register and to attend classes without a completed admissions file, is granted a maximum of four weeks of classes (20 class days) to complete satisfactory admissions records, or be changed to audit (non-credit) status. No fees will be refunded in such cases. It is the student’s responsibility to see that records are received by the Director of Admissions!

TRANSIENTS

FTU Students. A Florida Technological University degree-seeking student who wishes to earn credit at another college or university must obtain prior permission and approval of courses from the Dean or Department Chairman of his respective college and the Registrar of FTU. Credit earned without this transient approval may not be accepted.

Students from Other Colleges or Universities. Students in good standing with a 2.0 overall academic average in any accredited college or university wishing to enroll for one quarter at FTU may be considered for admission as a transient. Such enrollment terminates at the end of one quarter and does not presuppose regular acceptance by any college or department of the University. A statement of good standing (on the FTU Transient Form) indicating their willingness to accept the credits earned is required by the parent institution in lieu of official transcripts and other supporting documents.
AUDITORS

*University Students.* Any degree credit student may be admitted to a class as an auditor with the approval of the chairman of the department in which the course is offered; however, no credit by examination may be earned on work audited. For degree credit students, a course may be changed from audit to credit only during the Add-Drop Period and then only with his faculty adviser's consent. Auditors will not receive university credit, nor is the instructor obligated to administer any tests.

No student may change from credit to audit unless passing (vide., the Withdrawal Policy).

*Non-University Students.* With the approval of the chairman, any person not enrolled in the University may be admitted to classes as an auditor if the class is not already filled. A simplified application may be completed and registration accomplished at one of the two late registration periods scheduled during the Add-Drop Period. No late fee is required, no university credit is given, and the instructor is under no obligation to give tests to auditors. Those admitted shall pay the normal fees per quarter hour, and no refund is possible after a class has been attended. The University reserves the right to deny admission as an auditor without cause.

CONTINUING EDUCATION STUDENTS

Application, registration, and payment of fees for those taking a course off-campus may be completed prior to, or during, the first or second class meeting. Receipts will be mailed to students registering during the first or second class. No registration will be accepted after the first class meeting of the second week. The regular institutional calendar will apply to Continuing Education classes with the following exceptions:

No late registration fee will be charged.

Enrollment in these courses will be closed after the end of the first class meeting of the second week.

The student may receive a complete refund if he withdraws prior to the end of the first class meeting of the second week.

The Add-Drop Period will extend through the end of the first class meeting of the second week.

1 See Application Deadline — page 46.
Also, see Records Deadline — page 46.
CONCURRENT ENROLLMENT

Concurrent enrollment in another institution is permitted only when approval to be a transient student has been obtained.¹

NON-DEGREE STUDENTS – On-Campus

Non-degree students (21 years of age or older) without previous college experience, or who are eligible to return to their last previously-attended college, may provide evidence (viz., an acceptable high school record, or approved test scores, or satisfactory transcripts, plus a favorable recommendation that they are qualified to do the proposed work) and enroll as non-degree students in classes without meeting all of the requirements established for the degree programs. Persons under 21 years of age wishing to enter as non-degree students must meet the same admissions requirements as degree-seeking students.

Only students furnishing complete records may register for as many as 12 quarter hours.

Non-degree-seeking students wishing to change their status and work toward a degree must meet the admissions requirements of such students or earn a minimum of 24 quarter hours with a minimum 2.0 GPA on all college work attempted. Not more than 32 credit hours earned as an unclassified non-degree student may be counted toward a degree if and when the student’s category changes to that of degree-seeking.

HEALTH AND CITIZENSHIP

All full-time (7 or more quarter hours) applicants must have a satisfactory health and citizenship record.

FLORIDA RESIDENCE

For the purpose of assessing tuition, applicants are classified as Florida or non-Florida students. In applying this regulation, “applicant” shall mean a student applying for admission to Florida Technological University if he is 21 years of age or older. When he is a minor, the regulation shall apply to his parents, parent, or guardian. If an applicant has not resided and had his home in the State of Florida for at least 12 months

¹See Transients (FTU Students) — page 47.
immediately preceding his registration, he is required to pay the tuition and other charges of non-Florida students. However, the applicant cannot claim continuous residence in Florida by virtue of enrollment in any college or university in the state of Florida for the required period.

All students who do not qualify as Florida students are classified as non-Florida students.

A minor applicant whose father is a member of the military establishment and claims residency should outline the period of time that his father has resided in Florida, whether his father entered service from Florida, whether or not his home on his military records is Florida and other information that would assist in determining residency.

**ORIENTATION AND ADVISEMENT**

After the applicant has been advised of his admission, he will be notified of his priority number and time for registration. However, prior to the registration, he will be required to attend a University orientation program to be followed by a conference with his academic adviser. Adviser assignments are based upon the major area indicated on the student’s application.

**TRANSFER CREDITS**

A transfer grade of less than "C" may not be counted to satisfy credit hour requirements for graduation. However, a course in which a "D" grade was received may be used to fulfill a specific subject matter requirement provided a higher grade was earned in a more advanced course in the subject sequence.

**CREDIT BY EXAMINATION**

Students of superior ability and preparation who have already gained a knowledge of subjects offered at the University may be permitted with permission of the Dean of their College to take credit by examination in certain courses. Such credit may not have been previously used to satisfy high school graduation requirements. If the student passes with satisfactory grades, he will receive degree credit for a course taken with credit by examination.

Permission to utilize such examinations is granted by the Dean of the College in which the course is offered. The Dean will also establish the conditions for the examination. Permission may be given, subject to the following conditions:
1. Credit by examination is limited to 45 quarter hours. This credit may not be used to reduce the University’s minimum residence requirements. The 45 quarter hour limit may not be in addition to correspondence, extension, and/or service school credit.

2. The student must have been admitted to the University and must be in good standing. The examinations must be taken while the student is enrolled in the University, and credit will be granted at the end of the quarter in which the examination was passed.

3. On notification that permission is granted, the Registrar will issue an official permit. No instructor may give an examination until the official permit has been received. The fee of $5.00 per credit hour will be charged.

4. If a grade of “D” or higher is earned on the examination, the appropriate grade received in the course will be entered with its corresponding grade points. If a grade lower than “D” is earned, only the fact that the examination has been attempted will be recorded. The student may attempt to earn credit by examination in the same course only once.

5. Students may not schedule examinations in courses which they have audited.

ADVANCED PLACEMENT PROGRAM

Florida Technological University will participate in the advanced placement program conducted by the College Entrance Examination Board. Provisions now exist for examinations in Biology, Chemistry, English, European History, French, German, Latin IV, Latin V, Mathematics, Physics, and Spanish. Examinations in Russian are being added. Advanced placement and credit will be granted in appropriate subjects to freshman students who have taken the advanced placement examinations and achieved a grade of four (4) or five (5). When the grade is three (3), the decision regarding the credit will be referred to the judgment of the individual department.

COLLEGE LEVEL EXAMINATION PROGRAM

Exemption or credit may be awarded on the basis of satisfactory performance on appropriate subject matter examinations of the College
Level Examination Program. Students interested in receiving exemption or
credit by this means should write directly to ETS for application, lists of
certified testing centers, and dates of testing. Write to:

EDUCATIONAL TESTING SERVICE
College Level Examination Program
Princeton, New Jersey 08540

GENERAL REQUIREMENTS FOR ALL UNDERGRADUATE DEGREE
STUDENTS

A minimum of 90 quarter hours of work taken for a bachelor’s degree
must be earned in a senior institution.

A minimum of 72 quarter hours of work taken for a bachelor’s degree
must be taken in 300-level courses or above.

A minimum of (and the last) 45 quarter hours must be earned in
residence at FTU.

A maximum of 45 quarter hours of extension, correspondence, Armed
Forces credit, and credit by examination are applicable toward a degree.

QUARTER HOURS EXPLAINED

The graduation credit value of each course of instruction is stated in
terms of quarter hours. A quarter hour of credit represents one class hour
of work (or two or three laboratory hours of work) per week for a quarter.

FEES -- Late and Course Change

Applicants who file credentials after the deadline are required to
register late and pay a late registration fee of $25.00. Students who initiate
class schedule changes during the five-day Add-Drop Period shall pay
$1.00 for each course added. Should the changes be initiated by the
administration, no fee shall be charged.¹

GRADING SYSTEM

The University will utilize an alphabetic grading system. This system,
with a grade point equivalent per quarter hour, is as follows:

¹ See Application Deadline — page 46; Records Deadline — page 46.
Schedule Changes (Add-Drop Policy), above.
A - Excellent ....................................................... 4 grade points
B - Good .......................................................... 3 grade points
C - Average ........................................................ 2 grade points
D - Passing .......................................................... 1 grade point
F - Failure ........................................................... 0 grade point
S - Credit ............................................................. 0 grade point
W - Withdrawal (no penalty) ..................................... 0 grade point
X - Audit .............................................................. 0 grade point
I - Incomplete ..................................................... 0 grade point

The grade point average (GPA) is the average number of grade points per quarter hour attempted and is computed by dividing the total number of grade points assigned by the total number of quarter hours attempted, less hours resulting from S, W, X, and I grades. The grade point average for graduation requirements is 2.0 (C) and will be computed on the student's total academic program.

HONORS

Each student graduating from Florida Technological University will, as his achievement warrants, be recognized in the graduation program and have these honors posted on his permanent record, according to the following schedule of grade point averages.

1. Total grade point average 3.80 to 4.00 - summa cum laude
2. Total grade point average 3.40 to 3.79 - magna cum laude
3. Total grade point average 3.00 to 3.39 - cum laude

General honors are based on not less than 72 quarter hours of full-time attendance, prior to the quarter preceding graduation. For students who have attended FTU only, their FTU grade point average is used, and for transfer students their overall grade point average is used.

DEANS' LIST

Students who register for and complete at least 12 Quarter Hours with a 3.0 GPA and no grade less than "C" during a quarter are eligible for the Deans' List, according to the following classifications:

Summa cum laude list ............................................. 3.80 to 4.00 Qtr. GPA
Magna cum laude list ............................................. 3.40 to 3.79 Qtr. GPA
Cum laude list ..................................................... 3.00 to 3.39 Qtr. GPA

This list will be published by the colleges each quarter.
SCHEDULE CHANGES -- Add-Drop Policy

Add: Students may add a course during the official Add-Drop Period (the first five class days of each quarter). After the first five class days, no course may be added. Approval of the student's faculty adviser is necessary before any course change. (For Continuing Education courses “Add’s” will be accepted up to and including the second class meeting.) A $1.00 fee will be charged for each course added when the change is initiated by the student. When the change is initiated by the University, no fee shall be charged.¹

Drop: Students may drop a course during the official Add-Drop Period (the first five class days of each quarter). The fact that the student was enrolled in a class so dropped will not appear on the permanent record. Approval of the student's faculty adviser is necessary before any course change. For withdrawal after the first five class days, consult the Withdrawal Policy.

STUDENT LOAD -- Maximum

A student who is enrolled in 15 quarter hours of course work is considered to be carrying a normal academic load. Students desiring to take 19 or more quarter hours of course work must obtain written permission from the Dean of the College in which they are enrolled.

ACADEMIC STANDING

It is of major concern to the University that each student should make reasonable progress toward his educational goal. A guidance and counseling service is provided to aid all students at all times, but special attention is given when a student is not progressing satisfactorily. Every effort will be made to aid him in the resumption of satisfactory progress.

Acceptable academic standing at the University is reserved for those students who achieve and retain a GPA of 2.0 (C) or higher.² A student remains in good standing academically as long as he achieves normal academic progress required for graduation as described above.

STUDENT CLASSIFICATIONS

Students will be classified by level, on the basis of quarter hours satisfactorily earned:

¹ See Fees (Late and Course Change) — page 40.
² See Grading System — page 53.
FRESHMAN: through 44 quarter hours
SOPHOMORE: 45-89 quarter hours
JUNIOR: 90-134 quarter hours
SENIOR: 135 or more quarter hours, prior to completion of baccalaureate requirements
GRADUATE: any student enrolled in graduate-level courses who has a baccalaureate degree

Students will be classified as "full-time", based on the quarter-hour load for which they register each quarter, according to the following minimum schedule:

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fee-assessing purposes</td>
<td>7 Qtr. Hrs.</td>
</tr>
<tr>
<td>Selective Service</td>
<td>12 Qtr. Hrs.</td>
</tr>
<tr>
<td>Veteran's benefits (full allowance)</td>
<td>14 Qtr. Hrs.</td>
</tr>
<tr>
<td>Veteran's benefits (3/4 allowance)</td>
<td>10 Qtr. Hrs.</td>
</tr>
<tr>
<td>Veteran's benefits (1/2 allowance)</td>
<td>7 Qtr. Hrs.</td>
</tr>
</tbody>
</table>

Students registered for less than seven quarter hours in any one quarter will be considered "part-time" students.

Other Student classifications are as follows:

AUDITOR: A student registered for any credit course who is not seeking credit.

NON-CREDIT: A student registered for non-credit offerings, such as Remedial English, Mathematics, etc.

SPECIAL STUDENT: A student of demonstrated academic ability who does not meet the regular requirements for admission.

TEMPORARY: A student who is permitted to register and to attend classes whose admission file is incomplete.

TRANSIENT: (1) A student registered at Florida Technological with the approval of some other university or college, where he is regularly enrolled, or (2) an FTU student temporarily in attendance at another university or college, with the approval of FTU.

UNCLASSIFIED: A student earning credit, but not working on a degree program.
ACADEMIC STANDARDS FOR LEADERSHIP

To be eligible for any position of leadership or responsibility with any recognized student organization, publication, or activity, a student must be enrolled in a minimum of 12 quarter hours, possess an FTU grade point average of at least 2.0 (C), and must not be on academic or restrictive disciplinary probation. Applications for appeals, due to extenuating circumstances, are available in the office of the Dean of Student Affairs.

INCOMPLETE GRADE

A grade of "I" (Incomplete) is assigned by the instructor when a student is unable to complete a course because of extenuating circumstances. It is the student's responsibility to make the necessary arrangements with the instructor for the removal of an "I" grade. This must be done two weeks before the end of the next successive quarter in which the student is enrolled. If the instructor from whom the course was taken is not available, arrangements must be made with the chairman of the department responsible for the course. If a student registers for a course which already appears on his permanent record with the grade of "I" the "I" shall immediately become an "F".

ACADEMIC WARNING, PROBATION, DISQUALIFICATION, AND EXCLUSION POLICY

Academic warning and probation are intended to inform the student who is making unsatisfactory progress of his need to alter study habits and seek additional counseling. Early recognition will notify the student and his parents of the possible jeopardy to his academic goals and will allow opportunity to demonstrate acceptable performance.

A student who does not meet the academic standards as stated below, will be placed on academic warning for one quarter. If his academic performance is not raised to an acceptable level, he will be placed on academic probation in the succeeding quarter. Every student not admitted on probation has a minimum of two quarters before being disqualified or excluded.

A student who is disqualified may not enroll at the university for a period of one quarter. Academic exclusion implies permanence and has no established time limit.

A student may be on academic warning at FTU for only one quarter. If the student has been on academic warning or probation and has returned to good standing, all subsequent corrective academic action will begin with academic probation.
Every student has the right to appeal academic warning, probation, disqualification, or exclusion to the University Admissions and Standards Committee.

A non-transfer FTU student who fails to produce a 2.0 (C) grade point average (GPA)\(^1\) will be placed on academic warning. A student admitted or placed on academic warning must attain a quarter* GPA of 2.0 (C) or better or be placed on academic probation. If a student earns a 2.0 (C) or better quarter GPA on all work attempted after being placed on academic probation, he will be continued on academic probation until his FTU* GPA is 2.0 (C). Upon achieving a 2.0 FTU GPA, the student will be removed from probation. Failure to earn a 2.0 quarter GPA when a student is on academic probation will result in academic disqualification.

A transfer student admitted by the University Admissions and Standards Committee on academic warning must attain an overall* GPA of 2.0 (C) or better by the end of the first quarter of attendance or be placed on academic probation for the second quarter. Academic probation will be continued until the overall GPA reaches 2.0 (C) provided the quarter GPA does not fall below 2.0 (C). A transfer student admitted on academic probation must earn a 2.0 (C) or better GPA on his first quarter's work and must maintain a 2.0 (C) or better FTU GPA while on probation or be disqualified from the university. Transfer students who have not previously been on probation will be placed on academic warning if their FTU or overall GPA should fall below 2.0 (C).

A student readmitted by the University Admission and Standards Committee following academic disqualification must earn either a 2.0 (C) quarter GPA or a 2.0 (C) FTU GPA to avoid academic exclusion. The work of each readmitted student will be reviewed each quarter and appropriate action taken as his academic record warrants.

*LEGEND OF TERMS:  
Quarter Average — Grade Point Average on work attempted during any given quarter.  
FTU Average — Grade Point Average on all work attempted while in attendance at Florida Technological University.  
Overall Average — Grade Point Average on all work attempted since entering college, including work from all previously attended institutions.

\(^1\) See Grading System — page 53.
EARNING CREDIT WHILE DISQUALIFIED OR EXCLUDED

A student disqualified while a Freshman or Sophomore and who subsequently receives an A.A. degree (with a 2.0 average on all college work attempted) from an accredited State of Florida junior college may be readmitted to the university with credit earned accepted in accordance with standard University policies.

In all other instances, during the quarter immediately following disqualification from Florida Technological University, a student may not earn credit toward a degree at FTU by taking credit in residence at another institution or through extension or correspondence courses.

A student who attends other colleges or universities after the period of disqualification has elapsed will be classified as a transfer student and his readmission will be based on his total educational record.

WITHDRAWAL POLICY -- From a Course (After Add-Drop Period) or from the University.

In order to withdraw from a course after the first five days, the student must have the approval of his faculty adviser and the instructor. Withdrawal forms may be obtained from and must be returned to the Registrar’s Office.

A “W” grade will be entered for a student who withdraws prior to the end of the fourth week of classes. A “W” will be entered for a student who withdraws while passing after the fourth week. An “F” will be entered for any student who withdraws while failing after the fourth week. A student who withdraws from a class or from the college without approval at any time prior to the reporting of final grades will receive a grade of “F” in the course or courses dropped.

No student may change from credit to audit after the fourth week unless passing in the course to be changed.

No student may withdraw from a class or from the University or change from credit to audit during the last two weeks of any quarter.

These policies apply to part-time, as well as to full-time, students and are effective whether the student withdraws from one course or from the University.
In order that the student’s record at Florida Technological University may be complete at all times, a terminal interview with the Dean of the College and the Dean of Student Affairs must be arranged. Forms for *Withdrawal In Good Standing* may be obtained at the Registrar’s Office and must be returned to the Registrar. When signed by designated individuals, the student will be entitled to a status of good standing.

A student leaving the University during or at the end of the quarter with financial obligations to the University unfulfilled (for example, library fines, breakage fees, and so forth) will have the statement *Not in Good Standing* entered on the permanent record.

**STEPS IN THE GRADUATION PROCESS**

Students should apply to the Registrar for graduation before registering for their final quarter of attendance. Following completion of 150 quarter hours of course work applicable toward an undergraduate degree, the student should report to the Registrar’s Office and initiate the application process for graduation.

1. The last possible day to complete an Application for Graduation is the last day of the Add-Drop Period for the quarter in which the student expects to complete degree requirements.¹

2. The Application for Graduation must be approved and signed by the student’s adviser.

3. The applicant must take the application for authentication to the Dean of the College that is to grant the degree. The student then returns to the Registrar’s Office for completion of the application.

All candidates certified to be eligible for a degree are expected to be present for graduation. In the event that circumstances or hardships prohibit attendance, permission to receive the degree in absentia may be obtained from the Registrar’s Office.

All students making application to receive the baccalaureate degree from Florida Technological University must register for and complete the Graduate Record Examination (GRE) — (Basic Verbal and Quantitative), before they will be allowed to graduate. Contact the Developmental Center to complete this requirement.

¹See Academic Calendar — page 8.
GRADUATE STUDIES

GENERAL INFORMATION

The Office of Graduate Studies consists of a Director who is assisted by a Graduate Council of appointed representatives from each college. The Office of Graduate Studies is responsible for the establishment and monitoring of minimum general standards of graduate work in the University and for the coordination of the graduate programs of the various colleges of the University. The responsibility for the detailed operation of graduate programs is vested in the individual colleges. Prospective students are referred to the particular college section in this bulletin offering the graduate program in which they are interested.

GRADUATE PROGRAM

At this printing, part-time graduate study is available in the College of Business Administration and the College of Education. Additional graduate study may be authorized later.

ADMISSION TO GRADUATE STUDIES

Applications

Applications for admission to graduate study may be obtained from the Registrar, the Dean of the College offering the program, or from the Director of Graduate Studies. Applications which meet minimum standards for admission are referred to the Dean of the appropriate College for approval or disapproval.

No application will be considered without complete official transcripts of all undergraduate and graduate work. All transcripts must be received directly from the Registrar of the institution in which the work was attempted.

Admission Requirements

Unqualified admission to graduate studies is normally dependent upon the presentation of a baccalaurate degree from an accredited college with a grade point average (GPA) of at least 2.8 and acceptance by the Department or administrative unit offering the graduate program to which
the prospective student is applying. A student may be provisionally admitted with less than a 2.8 GPA upon recommendation of the Dean of the College to which he seeks admission. Conditions for advancement to regular status will be stipulated by the appropriate College Dean (or Deans) based on the recommendation of the student's major Department (or administrative unit) and subject to approval of the Director of Graduate Studies.

While the general admission requirements described above apply generally throughout the University, certain additional requirements may be established by the individual Colleges.

Transfer of Graduate Credit

Nine quarter credits may normally be transferred to FTU for application to a Masters program. A greater number of credits may be transferred at the discretion of the Graduate Council upon a petition made by the student through the Dean of his College.

Graduate Record Examination Requirement

All students are required to submit scores on the Graduate Record Examination (GRE) for admission to graduate study. Those scores which constitute a satisfactory performance on the GRE are determined by the College to which the student is applying. Each applicant must submit scores on the aptitude section of the GRE but is encouraged, either at the request of the department concerned, or on his own volition, to submit additional scores on one or more advanced subject matter tests of the GRE.

The GRE is given in October, December, January, February, April, and July at numerous locations in the United States. To determine the exact dates and most convenient locations, applicants should write to the Educational Testing Service, Princeton, New Jersey 08540. Advanced registration is required and scores are usually received about a month after the examination.

Students who apply for admission too late to take the GRE before their matriculation date may apply for admission presenting scores on Miller Analogies Test or Doppelt Mathematical Reasoning Test, or Minnesota Engineering Analogies Test, as appropriate to their chosen area. These tests
are available at numerous locations in the United States and on request at the Florida Technological University Developmental Center. The student is cautioned that such tests are not substitutes for the GRE. The GRE must be taken with satisfactory results prior to graduation at dates determined by the appropriate College.

If a particular county school superintendent so recommends, the GRE requirement may be waived for his educational personnel taking summer school courses for certification purposes.

Students applying for admission to graduate study in Business Administration are required to submit scores on the Admission Test for Graduate Study in Business (ATGSB). This test is given in November, February, April, July, and August at many locations in the United States. To determine exact dates and most convenient locations, students should write to the Educational Testing Service, Princeton, New Jersey 08540.

GENERAL REGULATIONS

Student Responsibility

The student is responsible for informing himself of all rules, regulations, and procedures required by the Office of Graduate Studies, and the College offering the course or program he is pursuing. Regulations will not be waived or exceptions granted because a student pleads ignorance of the regulation or claims failure of his adviser to keep him informed.

Student's Committee

It is the intent that the student's committee be influential in designing a program for the student; that it should provide continual guidance; and that it should be the principle mechanism for evaluation of the student's progress.

This committee must have at least three (3) members. Members of the committee will be appointed by the Dean of the College in cooperation with the Department or appropriate unit in which the student is enrolled.

Student's Program

A total program of study must be established for each student prior to completion of his first quarter. This program must be developed by the student in cooperation with his committee and should be approved by the
appropriate College Dean. A copy of the program and names of the student’s committee will be filed with the Office of Graduate Studies prior to the start of the student’s second quarter.

Loads

The maximum graduate registration normally allowed in any quarter is 15 credits, although a minimum of 9 credits may constitute a full load. Students applying for assistance under Public Law 89-358 (Veterans’ Readjustment Benefits Act of 1966) must register for 12 credits per quarter to qualify for certification as a full-time student.

Courses and Credits

Courses numbered 500-599 are primarily for beginning graduate students and those numbered 600-699 are for graduate students only. A maximum of 12 credits of dual level course work can be included in the student’s graduate program.

Grades and Scholarship

Acceptable grades for students pursuing graduate study are A and B. A cumulative grade point average (GPA) of 3.0, based on a minimum of the first 12 credits, shall be considered a satisfactory performance. A student whose GPA falls below this value will normally be dropped from the graduate program.
ACADEMIC PROGRAMS

Each college requires work in the Environmental Studies Program in addition to its respective curricula.

ENVIRONMENTAL STUDIES PROGRAM

The Environmental Studies Program presents to each student an opportunity to gain an insight into an organized body of knowledge designed to enhance the student's ability to make intelligent decisions in a world of the future. This program provides the student with an acquaintance of many of the major areas of academic inquiry. It permits the student to make a more meaningful choice of a major and provides insights into areas from which he may select courses for elective credit.

In order that the student may have a greater range of course selection, as well as an opportunity to build a greater degree of flexibility into his academic program, the following Environmental Studies Program supersedes the program stated on Page 31, Volume 1, No. 1, of the Florida Technological University Bulletin 1967-68/1968-69.

ENVIRONMENTAL STUDIES (69)

Basic Program (55)

Communications (3 hours required from Groups I, II, & III)

I. Composition (3)
   ENG 101 Composition I (3)

II. Speech
   SPE 101 Fundamentals of Oral Communication (3)

III. Composition, or Current Literature, or Computer Programming (3)
   COMP 101 Introduction to Computer Science (3)
   COMP 102 Computer Programming (3)
   ENG 102 Composition II (3)
   ENG 103 Current Literature (3)

Humanities
   Humanities (Western) (9)
   HUM 301, 302, 303 Western Humanities (3,3,3)

Scientific Environment

I. Mathematical Science (8)
   Courses in both Mathematics and Statistics must be included. Courses in Computer Science may not be used to satisfy this requirement.
II. Biological and/or Physical Science (8)
   All courses in Biology, Botany, Chemistry, Geology, Microbiology, Physics, and Zoology may be used in the Environmental Studies Program. ENGR 151 also may be included.

Social Environment

I. Social Sciences
   Economics
      ECON 201,202. (3,3)
   Geography
   History
      Any course in History
   Political Science
      Any course in Political Science

II. Behavioral Science
   Anthropology
      SOC 321,322 (3,3)
   Psychology
      PSY 201,202 (3,3)
   Sociology
      SOC 201,202 (3,3)

III. Foreign Language
   Nine hours in one of French, German, Russian, or Spanish

Option A: Nine hours from each of Groups I and II, with at least two fields represented in each group.

Option B: A full year (i.e., nine hours) of one of the languages listed in Group III plus either (a) six hours from Group I and three hours from Group II or (b) three hours from Group I and six hours from Group II.

General Electives
   Physical Education (ESPE) may be used to satisfy all or part of this requirement.

Advanced Program (14) (Required of all students)

Business and Engineering Environment

I. Business (3)
   BADM 301 Business Concepts (3) or
   ECON 307 Economic History of U.S. (3)

II. Engineering (3)
   ENGR 481 Man and Machine (3)
   ENGR 482 Engineering and Technology in History (3)
   ENGR 483 Technology and Social Change (3)
   ENGR 484 Science in History (3)
   ENGR 485 Topics in Urban Development (3)
   ENGR 486 Science, Engineering, and Ethical Systems (3)
   ENGR 487 Historical Architecture
Senior Seminars

Each student matriculating in one of the five colleges will take four of the five seminars, omitting the one offered by his college. Students in the General Studies program will take all five seminars.

I. Arts and Social Sciences in Human Affairs
   HSS 490 Arts and Social Sciences in Human Affairs (2)

II. Business in Human Affairs
    BADM 490 Business in Human Affairs (2)

III. Education in Human Affairs
     EDTA 490 Education in Human Affairs (2)

IV. Science in Human Affairs
    SCI 490 Science in Human Affairs (2)

V. Engineering in Human Affairs (2)
   ENGR 490 Engineering in Human Affairs (2)

TOTAL 69
MAJOR IN GENERAL STUDIES

PURPOSE

The General Studies curriculum is a university-wide general purpose program leading to a Bachelor’s Degree in General Studies (BGS). The program is administered through the office of the Assistant Dean for Academic Affairs and is designed for liberal education and academic flexibility. It recognizes that, apart from the professional curricula, there are many combinations of courses which can be structured into meaningful programs to meet the needs of individual students.

The General Studies program has two main purposes:

1. It accommodates students who desire a liberal, non-professional education encompassing several fields.

2. It provides a means for students to start a productive university education while delaying decision on professional curricula until as late as the end of the sophomore year.

Students who are undecided as to their major should pursue the General Studies program until they can select a specific major area.

Students fulfilling the requirements for the BGS degree must complete the Environmental Studies Program, all five ESP Senior Seminars, and a minimum of 22 credits in each of five course areas. The five subject areas must be distributed over at least four colleges. Courses used to fulfill the Environmental Studies Program may not be used to satisfy any of the five course area requirements. Of these credits, at least half from each college or area must be in courses numbered 300 and above.

COURSE AREA GROUPINGS

Behavioral and Social Sciences
Anthropology, Economics, Geography (Social), History, Political Science, Psychology, and Sociology.

Biological Sciences
Biology, Botany, Microbiology, Zoology, and selected courses in the Allied Health Sciences.
Business Administration
Selected introductory and functional field courses.

Communications
Journalism, Radio-Television, Speech and general courses in Communications.

Education
Teaching Analysis, Human Development, and other related courses in Education.

Engineering
Selected courses from the engineering core, respective areas of concentration, and the inter-disciplinary grouping.

Fine Arts
Art, Music, and Theatre.

Humanities
English, Foreign Languages, Philosophy, Religion, and Humanities courses.

Mathematical Sciences
Computer Science, Mathematics, and Statistics.

Physical Sciences
Chemistry, Geography (Physical), Geology, Physics, and general courses in the Earth and Space Sciences.
COLLEGE OF BUSINESS ADMINISTRATION

The purpose of education may be described as the maximum development of one's potential for accomplishment as an individual and as a responsible member of a dynamic society. The goal of the College of Business Administration is an extension of this purpose into the field of business.

The degree Bachelor of Science in Business Administration with several majors is offered by the College of Business Administration.

Graduates of the College of Business Administration may pursue a wide variety of careers in business and industry, in education, and in government. The various programs of study offered by the College are designed to assist the student in obtaining a sound academic preparation for the career of his choice.

COURSE REQUIREMENTS FOR GRADUATION

Areas                                      Quarter Hours

1. Environmental Studies Program         69
   Basic (55)
   Advanced (14)

2. Business Core                         51-55

3. Major Field of Concentration          24-33
   Accountancy (33)
   Business Administration (26-28)
   Economics — General (26)
   Economics — Quantitative (25)
   Finance (29)
   Management (28)
   Marketing (33)
   Transportation (24)

4. Electives (varies with major)         26-39
   TOTAL                                  183

Environmental Studies Program (69)

The student in the College of Business Administration is required to fulfill the general regulations for all undergraduate degree students listed on page 52, satisfy the Environmental Studies Program and include MATH 115 or MATH 121 in the mathematical science sequence. In addition, a student majoring in Marketing or Management must include PSY 201.

Each student must include nine hours of history, political science, and/or economic history in his academic program.
Business Core (51-55)

The business core is designed to introduce the student to the foundation courses in each of the major areas of business administration. The business core provides a platform from which the student builds his major course of study.

<table>
<thead>
<tr>
<th>Course</th>
<th>Major Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADM 101</td>
<td>Business</td>
<td>4</td>
</tr>
<tr>
<td>ACCY 101</td>
<td>Principles of Accountancy</td>
<td>9/5</td>
</tr>
<tr>
<td>ECON 201</td>
<td>Principles of Economics</td>
<td>9</td>
</tr>
<tr>
<td>ENG 301</td>
<td>Professional Report Writing</td>
<td>3</td>
</tr>
<tr>
<td>FIN 301</td>
<td>Finance</td>
<td>5</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Management</td>
<td>5</td>
</tr>
<tr>
<td>MKTG 301</td>
<td>Marketing</td>
<td>5</td>
</tr>
<tr>
<td>ECON 321</td>
<td>Business and Economic Statistics</td>
<td>4</td>
</tr>
<tr>
<td>BADM 371</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>ECON 401</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BADM 495</td>
<td>Business Policies</td>
<td>5</td>
</tr>
</tbody>
</table>

Major (24-33)

A student may major in any of the following areas of specialization. Specific major course requirements are listed under the name of the major.

- Accountancy
- Economics
- Management
- Business Administration
- Finance
- Marketing

Beginning in 1970-71 – Transportation

Elective (26-39)

1. A student is expected to enroll in courses at a level commensurate with his class standing.

2. A minimum of 15 elective credit hours must be earned outside the College of Business Administration.

3. A minimum of 6 credit hours of upper level (300-400) courses must be included in the elective credits counted toward a degree.

TOTAL (183)

MAJOR COURSE REQUIREMENTS
ACCOUNTANCY

Accountancy is usually selected as a major by the student who is preparing for private, governmental, or public accounting, or who wishes to use accountancy as general training for a career in business.
In private accounting, the accountant's employment is limited to a single organization. The size and nature of the organization determines the scope of the accounting activities but, broadly defined, the following duties are illustrative: design and installation of accounting systems, preparation of financial statements and reports, cost accounting, internal auditing, interpretation and analysis of budgets, and preparation of tax returns.

Governmental accounting deals with accounting principles, standards, and procedures applicable to state and local governments and to institutions for the purpose of expressing an opinion as to the fairness of the information presented. The public accountant may be called upon to render services to clients which transcend the expression of an opinion on financial statements. These services include the areas of management consulting and tax service.

The student who wishes to sit for the Certified Public Accountant's Examination by selecting the one-year work-experience option should read Section 473.08, Florida Statutes, State Board of Accountancy.

Course requirements for a major in Accountancy are:

A. Required:
   ACCY 311 Intermediate Accounting (3)
   ACCY 312 Intermediate Accounting (3)
   ACCY 313 Advanced Accounting (3)
   ACCY 314 Advanced Accounting (3)
   ACCY 321 Cost Accounting (3)
   ACCY 331 Auditing (3)
   ACCY 341 Governmental Accounting (3)
   ACCY 351 Federal Income Tax Accounting (3)
   ACCY 461 Computer Applications to Accounting Problems (3)

B. Elective: (Two courses)
   ACCY 322 Cost Accounting (3)
   ACCY 434 Audit Report Writing (3)
   ACCY 352 Federal Income Tax Accounting (3)
   ACCY 491 Program Analysis (3)

C. Not more than 36 hours of credit in Accountancy beyond the college business core requirement may be counted in the 183 quarter hours required for graduation.

BUSINESS ADMINISTRATION

The increased use of sophisticated tools of quantitative analysis in the business world requires additional emphasis in the quantitative area. The business administration option provides an opportunity for the quantitatively able student to utilize his ability in the solution of business and economic problems through the use of quantitative tools.
Although the focus of this curriculum is on the solution of business and economic problems, a good foundation in mathematics and statistics is of particular value to the student selecting this major. There is a wide range of opportunities in business and industry, government, research, and education awaiting the student completing his major in business administration.

Course requirements for a major in Business Administration are:

A. Required:

BADM 311 Mathematical Applications to Business, I (3)
BADM 312 Mathematical Applications to Business, II (3)
BADM 484 Operations Research (3)
ECON 421 Economic Statistical Analysis (5)

B. Elective: (Two courses from group 1 and group 2)

1. ACCY 321 Cost Accounting (3)
   BADM 372 Business Law (3)
   BADM 444 International Business Operations (3)

2. ECON 371 Mathematical Economics (3)
   ECON 451 Econometrics (3)
   MKTG 344 Marketing Logistics (3)
   MKTG 384 Marketing Research (5)

C. Not more than 30 hours of credit in Business Administration beyond the college business core requirements may be counted in the 183 quarter hours required for graduation.

ECONOMICS

The discipline of economics is defined in several ways. It is most frequently described as the study of how man uses limited resources to satisfy his wants. Within this framework, the economist is concerned with (1) the functioning of the economy as a whole and (2) the functioning of individual units within the economy, particularly the business firm and the consumer. Many important fields are covered in the study of economics, including economic theory, labor, international trade, economic history, agriculture, quantitative analysis, public utilities, economic systems, economic development, public finance, business and government, and urban economics.

One of the major goals of economics is the preparation of a student for intelligent citizenship. The economics courses required of all students in the College of Business Administration are designed to provide a sound grasp of tools of analysis and measurement, as well as the ability to apply systematic analysis to problems of business policy. A major in economics prepares the student for careers in a variety of areas, including business, industry, and government.

Although all of the Economics courses are offered and administered by the College of Business Administration, they are available to students
majoring in Economics in either the College of Business Administration or the College of Humanities and Social Sciences.

The student majoring in economics may earn either a Bachelor of Science in Business Administration degree in the College of Business Administration or a Bachelor of Arts degree in the College of Humanities and Social Sciences. There are significant differences in these two degree programs. The Bachelor of Science in Business Administration degree student must complete the business core. The Bachelor of Arts degree requirements are listed under the College of Humanities and Social Sciences section of this catalog.

Major course requirements for the Bachelor of Science in Business Administration degree with a major in Economics are:

I. GENERAL ECONOMICS

A. Required:

ECON 301 Intermediate Price Theory (4)
ECON 311 Intermediate Money, Income and Employment Theory (4)

B. Elective: (Six courses in economics not used elsewhere)

C. Not more than 30 quarter hours of credit in Economics beyond the College of Business Administration’s business core requirements may be counted in the 183 quarter hours required for graduation.

II. QUANTITATIVE ECONOMICS

A. Required:

ECON 301 Intermediate Price Theory (4)
ECON 311 Intermediate Money, Income and Employment Theory (4)
ECON 371 Mathematical Economics (3)
ECON 421 Economic Statistical Analysis (5)
ECON 451 Econometrics (3)

B. Elective: (Three courses in economics not used elsewhere)

C. Not more than 30 quarter hours of credit in Economics beyond the College of Business Administration business core requirements may be counted in the 183 quarter hours required for graduation.

FINANCE

The program in finance is designed to provide the student with a broad knowledge in the areas of business and corporation finance and investments. The program provides the student with the theoretical background and the tools of analysis required for making effective judgments in finance.

Business and corporation finance is concerned largely with the institutions and instruments through which short-term and long-term capital may be obtained and the management of funds in the individual firm.
The area of investments includes an analysis of the different types of outlets for investment funds, such as stocks and bonds, and an examination of the various factors involved in investment decisions and portfolio management.

The study of finance prepares the student for careers in business financial management and with financial institutions. Commercial banks, savings and loan associations, insurance companies, and investment firms represent some of the financial institutions seeking the student who majors in finance.

Course requirements for a major in Finance are:

A. Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN 321</td>
<td>Investments</td>
<td>3</td>
</tr>
<tr>
<td>FIN 331</td>
<td>Money and Banking</td>
<td>4</td>
</tr>
<tr>
<td>FIN 411</td>
<td>Financial Institutions</td>
<td>3</td>
</tr>
<tr>
<td>FIN 431</td>
<td>Financial Management</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Elective: (Two courses from group 1 and one course from group 2)

1. ECON 311 Intermediate Money, Income and Employment Theory (4)
   FIN 311 Risk and Insurance (5)
   FIN 421 Security Analysis (5)
2. BADM 484 Operations Research (3)
   ECON 341 International Economics (3)
   ECON 431 Public Finance (3)

C. Not more than 30 quarter hours of credit in Finance beyond the college business core requirement may be counted in the 183 quarter hours required for graduation.

MANAGEMENT

The study of management includes an investigation into the areas of organization theory, personnel management, and production management. An understanding of organizations and the process by which they develop and influence behavior are important to the study of management.

Personnel and industrial relations is concerned primarily with the effective utilization of human resources within the business organization. Attention is focused on the organization as a social system and the forces which affect this system, such as the behavior of individuals in groups, economic conditions, and technology.

The production manager is concerned with the efficient utilization of the organization's material resources. The design and improvement of productive capacity and the coordination of the production process with other system activities are primary concerns.
A student majoring in management may find a wide variety of career opportunities in business, industry, or government.

A. Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 308</td>
<td>Social Psychology (4)</td>
<td></td>
</tr>
<tr>
<td>MGMT 324</td>
<td>Production Management (5)</td>
<td></td>
</tr>
<tr>
<td>MGMT 344</td>
<td>Organization Theory (5)</td>
<td></td>
</tr>
<tr>
<td>MGMT 364</td>
<td>Personnel Management (5)</td>
<td></td>
</tr>
<tr>
<td>BADM 484</td>
<td>Operations Research (3)</td>
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</tbody>
</table>

B. Elective: (Two Courses)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 321</td>
<td>Cost Accounting (3)</td>
<td></td>
</tr>
<tr>
<td>ECON 331</td>
<td>Economics of Labor (3)</td>
<td></td>
</tr>
<tr>
<td>MGMT 347</td>
<td>Human Relations in Management (3)</td>
<td></td>
</tr>
<tr>
<td>MGMT 367</td>
<td>Industrial Relations (3)</td>
<td></td>
</tr>
<tr>
<td>COMP 487</td>
<td>Computer Processing of Business Data (3)</td>
<td></td>
</tr>
</tbody>
</table>

C. Not more than 30 quarter hours of credit in Management beyond the college business core requirement may be counted in the 183 quarter hours required for graduation.

MARKETING

Marketing encompasses those business activities directly related to the process of placing meaningful assortments of goods and services in the hands of the consumer. Advertising and sales management, product planning, physical distribution, product pricing, and the investigation of the marketing environment are important subject areas included in the study of marketing. A marketing student is concerned with the efficient performance of these marketing activities and with the effective coordination of marketing activities with the other operations of the firm.

A student majoring in marketing may find career opportunities in the management and performance of marketing activities. These activities include buying, selling, distributing, pricing, new product planning, and advertising. Careers in marketing research are selected by students who are interested in the analysis and feasibility studies of various marketing strategies and policies. Opportunities are also available in education and government.

Course requirements for a major in Marketing are:

A. Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 308</td>
<td>Social Psychology (4)</td>
<td></td>
</tr>
<tr>
<td>MKTG 364</td>
<td>Advertising Management (3)</td>
<td></td>
</tr>
<tr>
<td>MKTG 367</td>
<td>Sales Management (3)</td>
<td></td>
</tr>
<tr>
<td>MKTG 384</td>
<td>Marketing Research (5)</td>
<td></td>
</tr>
<tr>
<td>MKTG 495</td>
<td>Marketing Policies and Strategies (3)</td>
<td></td>
</tr>
</tbody>
</table>

B. Elective: (One course from each group)

1. MKTG 324 Marketing Environment (3)
2. MKTG 326 Consumer Market Behavior (3)
TRANSPORTATION

(Not to be offered prior to 1970-71.)

Rapid changes are taking place in the several transportation industries, in traffic management, and in the planning and development of modern transportation systems. The major in transportation is designed to provide the student with an understanding of these changes and an appreciation of the relationship between transportation and society.

The program in transportation prepares the student for positions with the transportation companies, as well as for the management of transportation and traffic in industrial concerns. The study of transportation is also recommended for students who seek employment in planning and regulatory bodies of federal, state, and local government.

Course requirements for a major in Transportation are:

A. Required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 301</td>
<td>Intermediate Price Theory (4)</td>
</tr>
<tr>
<td>ECON 381</td>
<td>Economics of Public Utilities (3)</td>
</tr>
<tr>
<td>TRAN 301</td>
<td>Principles of Transportation (5)</td>
</tr>
<tr>
<td>TRAN 401</td>
<td>Transportation Pricing and Policy (3)</td>
</tr>
<tr>
<td>TRAN 411</td>
<td>Transportation Planning (3)</td>
</tr>
</tbody>
</table>

B. Electives: (Two Courses)

<table>
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<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>BADM 444</td>
<td>International Business Operations (3)</td>
</tr>
<tr>
<td>ECON 481</td>
<td>Economics of Urban Areas (3)</td>
</tr>
<tr>
<td>MKTG 344</td>
<td>Marketing Logistics (3)</td>
</tr>
<tr>
<td>SOC 321</td>
<td>Urban Sociology (3)</td>
</tr>
</tbody>
</table>

MASTER OF BUSINESS ADMINISTRATION DEGREE

The College of Business Administration offers a curriculum leading to the Master of Business Administration degree. The program of study is primarily concerned with the advanced study of broad business concepts.
and relationships. The purposes are (a) to strengthen the analytical tools of the individual for use in research necessary to resolve business problems, (b) to develop depth of knowledge of the business functions, (c) to expose the student to decision-making concepts and practice, and (d) to encourage a logical approach to the resolution of business problems. The graduate program is conducted under the direction of a faculty committee on graduate study.

Graduate courses are available in the late afternoon and evening for the convenience of individuals who are actively engaged in business.*

ADMISSION REQUIREMENTS

Admission is open to the student with a baccalaureate degree from an accredited college or university with an overall 2.8 grade point average. No previous academic training in business is required, and the M.B.A. program is open to graduates in business, science, liberal arts, engineering, education, and other fields. In evaluating a student's application for admission, primary emphasis will be given to his undergraduate record, the Graduate Record Examination, and the Admission Test for Graduate Study in Business. The applicant's intellectual development during the course of his previous academic career, his extracurricular activities, employment experience, and other evidences of motivation for graduate study in business will also be considered.

PURPOSE

No action will be taken on an application before the Admission Test for Graduate Study in Business score report, a transcript showing proof of attainment of the Bachelor's degree, and transcripts of all other colleges attended have been submitted to the Registrar, Florida Technological University. The applicant must arrange for transcripts to be submitted by the proper officials of the institutions which he attended. Transcripts in the possession of an applicant will not be accepted. It is the applicant's responsibility to make arrangements to take the two tests indicated above and to direct the Educational Testing Service to mail: the ATGSB score report to the College of Business Administration, the Graduate Record Exam to the Registrar at Florida Technological University. The ATGSB test is administered at locations throughout the country and in foreign test centers in February, April, July, August and November. Applications and information about the tests may be obtained by addressing the Educational Testing Service, Princeton, New Jersey, 08540. Completed applications for the test must be returned to the Educational Testing Service at least three weeks in advance of each scheduled test date.

*The Master of Business Administration program will be offered only on campus and on a part-time basis in 1969-70.
A personal interview in connection with the application for admission is desirable. Personal interviews can be arranged through the Dean's office.

Enrollment in graduate business courses is limited to students who have been regularly accepted in the Master of Business Administration program. Students who apply too late to take the Admission Test for Graduate Study in Business will be permitted to register for prerequisite courses only. (An exception can be made for a student ranking in the upper 10% of his undergraduate class.) The College of Business Administration office must have on file an application prior to registration for prerequisite courses.

PROGRAM OF STUDY

Prerequisites for Graduate Program

The following prerequisites must be completed before a student may enroll in graduate courses:

ACCY 101, 102, 103 (or ACCY 307) Basic or Accounting Concepts
BADM 371 Business Law
ECON 201, 202, 203, 321** Principles of Economics, Statistics
FIN 301 Finance
MGMT 301 Management
MKTG 301 Marketing

*Prerequisites may be satisfied through credit by examination (see page 50).

**Calculus may be substituted for four hours of Statistics.

Students completing their last preparatory course(s) may also register for graduate courses in the same quarter if they have been accepted into the graduate program.

Course Requirements

In addition to the prerequisites, a minimum of forty-five quarter hours of graduate study are required for the Master of Business Administration degree. Courses developed and scheduled for the 1969-70 academic year are listed below:

GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 611</td>
<td>Economics of the Firm (3)</td>
<td></td>
</tr>
<tr>
<td>ECON 621</td>
<td>Aggregate Economics - Income, Employment, and Growth (3)</td>
<td></td>
</tr>
</tbody>
</table>
FIN 601  Capital Budgeting and Financial Planning (3)
FIN 611  Working Capital and Financial Problems (3)
MGMT 611  Organizational Behavior (3)
MKTG 601  Marketing Policy (3)

Alternates

BADM 695  Business Research Methods
MGMT 601  Management Process

Additional course work will be required in managerial accounting, quantitative analysis for business decisions, business policy and responsibility, and statistics for business and economic analysis. These courses will be developed by the 1970-71 academic year.

Research Papers

No thesis is required for the M.B.A. degree. However, each student is required to submit a research paper after the completion of BADM 695 (Business Research Methods). The paper would be a critical and analytical review of the existing literature on a given subject, or the statement, exposition, and resolution of a hypothesis in an area of Business Administration. Style instructions may be obtained from the College Dean. It is the student's responsibility to communicate with the Chairman of his Graduate Committee for the assignment of a research paper adviser and other details of his graduate program.

Residence Requirements

The Masters of Business Administration degree may be earned by employed students who attend evening classes. A part-time student normally will be limited to six hours of credit per quarter, whether preparatory or graduate courses. Students who need most of the preparatory courses will probably need the equivalent of two full years of full-time study in order to complete the requirements for the M.B.A. degree. The approximate time required to complete the requirements for the degree will be determined on an individual basis.

Transfer Credit

A maximum of nine quarter hours of graduate credits beyond the preparatory requirements may be accepted in transfer from another institution. The student should request the transfer of credits promptly after being admitted to the M.B.A. program and prior to registration as this information will be considered in his course planning.
Scholastic Requirements

A minimum grade of "C" is required in all prerequisite work. An overall "B" average is required in all graduate work; no more than nine quarter hours of "C" grade credit can be included in a graduate program.

GENERAL INFORMATION

Additional information pertaining to the M.B.A. program is available in the graduate section of this bulletin. (See page 60).
The College of Education is organized as a professional college within the University. Each student who is planning a career in teaching in the elementary or secondary schools should enroll in this College.

The academic program is primarily concerned with three broad areas: Environmental Studies, Specialized Preparation and Professional Preparation. All of these areas are interrelated and interdependent.

The Environmental Studies requirements are designed to provide a broad foundation for each individual. These courses are offered by each of the colleges.

In general, specialized preparation in subject matter areas for secondary education majors is offered by the University's other colleges, while specialized elementary education content courses are offered by the College of Education. All programs are developed in cooperation with the other colleges within the University.

The professional sequence is the responsibility of the College of Education and is designed to:

A. Give insights into the processes of school curriculum and organization.

B. Present an opportunity for the student to understand how learning takes place, as well as furnish him with methods and procedures needed for successful teaching.

C. Develop an understanding of the society in which the school functions.

D. Build an awareness in the individual of his relationship with students and the community.

E. Provide significant pre-student teaching experiences and a culminating student teaching experience near the end of his program.

F. Stimulate each individual toward the realization of the challenges and responsibilities in the field of education and to begin the development of a basic philosophy of education.
Considerable emphasis is given to providing all education majors with an opportunity to have cooperatively planned learning experiences in a laboratory setting. The laboratory experiences are specifically designed to blend realistic practical experience with theoretical knowledge. In most instances elementary and secondary schools in Central Florida serve as educational laboratories for the students of the College of Education.

The College of Education plans cooperatively with Student Affairs in the development of an effective intramural program. It also provides the physical education courses that may be applied in the Environmental Studies program.

Program design will continue to change as evaluation and research determine the advisability of change in reference to the student's personal and academic needs.

Programs are offered leading to the Bachelor of Arts degree and the Master of Education degree in Education.

Bachelor of Arts Degree Program

The Career Teacher Programs are designed to lead to the Bachelor of Arts degree. Students are encouraged to enroll in the College of Education as early as the freshman year. Junior transfer students will enter Phase I of the Professional education sequence during the first quarter in which they enroll.

A minimum of 183 quarter hours is required for graduation. Requirements, however, vary according to the selected teaching major as follows:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)*</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>2. Academic Specialization</td>
<td>41-63</td>
</tr>
<tr>
<td>3. Professional Preparation</td>
<td>38-42</td>
</tr>
<tr>
<td>Phase I. Teaching Analysis and Human Development</td>
<td></td>
</tr>
<tr>
<td>Phase II. Developmental—Elementary Developmental—Secondary</td>
<td></td>
</tr>
<tr>
<td>Phase III. Teaching Strategies Student Teaching</td>
<td></td>
</tr>
<tr>
<td>4. Electives (20-34)</td>
<td>(varies with major)</td>
</tr>
</tbody>
</table>

*Student must complete a minimum of nine (9) quarter hours of English composition, rhetoric or grammar.
CERTIFICATION FOR TEACHING

Undergraduate Certification

All College of Education curricula are designed to fulfill the State of Florida certification requirements. Upon application to the State Department of Education a graduate may be issued a Rank III Florida Teaching Certificate.

UNDERGRADUATE CAREER TEACHER PROGRAM

The Career Teacher Program consists of three distinct Phases:

Phase I—Teaching Analysis

This phase is required of all education majors and designed to acquaint the student with basic teaching procedures, pre-instructional planning, phases of performance evaluation, and the developmental-behavioral characteristics of children. Various aspects of the teaching profession are analyzed. Experiences will provide the student a basis for deciding whether or not to pursue teaching as a career. Any university student in good standing who qualifies for sophomore courses may enroll in Phase I.

Phase II—Developmental

Developmental activities are structured to provide the prospective teacher opportunities to develop specific teaching skills and to expand his teaching field knowledge. Included are analysis of evaluation practices, school curricula, learning theory, special instructional techniques, and variables which affect classroom environment. Laboratory experiences in Phase II are jointly planned by public school personnel and university faculty. These student teaching experiences will occur in Teacher Education Centers which are selected public elementary or secondary schools. To be admitted to Phase II a student must have an overall 2.0 academic average, have successfully completed Phase I requirements, and must demonstrate competency in written and oral communication skills.

Phase III—Application

In Phase III the student applies the fundamentals of teaching and academic knowledge attained in Phases I and II. Under the supervision of a selected teacher, the student is responsible for developing and executing plans. A full quarter is devoted to student teaching. Concurrent enrollment in the seminar, Teaching Strategies, is required. To be admitted to Phase III, a student must have: satisfied the requirements for Phases I and II; a
2.2 average in his area of academic specialization; a 2.2 average in professional education; a 2.0 overall average; be recommended by the Phase II Teaching Team; and be accepted by the office of the Professional Laboratory Program. An application for Phase III, Student Teaching and Teaching Strategies, must be submitted during the first two weeks of the quarter prior to the student teaching quarter.

**ELEMENTARY EDUCATION**

The Elementary Education Programs are planned for students interested in the development and education of children twelve years of age and younger. Students majoring in elementary education are certified to teach grades one through six upon graduation and receipt of a state teacher’s certificate. Areas of study required are: (1) Environmental Studies (69 quarter hours); (2) Academic Specialization (41 quarter hours); (3) Professional Preparation (38 quarter hours); (4) Related Field of Academic Concentration (12-30 quarter hours); and (5) Electives 23 quarter hours).

<table>
<thead>
<tr>
<th>Required Academic Specialization Courses</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDEL 301 Teaching Mathematics in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 302 Mathematics Programs in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 306 Music in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 307 Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 312 Reading in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 315 Teaching Science in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 317 Teaching Social Sciences in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 405 Language Arts in the Elementary School</td>
<td>5</td>
</tr>
<tr>
<td>EDEL 406 Art in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 407 Classroom Diagnosis and Treatment of Reading Difficulties</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 408 Science Programs in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 409 Social Science Programs in the Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 415 Teaching Elementary School Health and Physical Education</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Required Professional Preparation Courses</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I—Analysis</td>
<td></td>
</tr>
<tr>
<td>EDTA 206 Human Development</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 307 Teaching Analysis</td>
<td>5</td>
</tr>
<tr>
<td>Phase II—Developmental</td>
<td></td>
</tr>
<tr>
<td>EDEL 311 Basic Foundations of Reading</td>
<td>3</td>
</tr>
<tr>
<td>EDPL 407 Student Teaching</td>
<td>6</td>
</tr>
<tr>
<td>EDTA 305 Principles of Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 306 Learning Theory</td>
<td>3</td>
</tr>
<tr>
<td>Phase III—Application</td>
<td></td>
</tr>
<tr>
<td>EDEL 316 Elementary School Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>EDPL 407 Student Teaching</td>
<td>9</td>
</tr>
<tr>
<td>EDPL 408 Teaching Strategies</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
</tr>
</tbody>
</table>
Related Field of Academic Concentration

A related field of academic concentration consisting of 12 to 30 quarter hours is required in one of the following areas: art, communication, early childhood education, English, French, humanities, library science, mathematics, music, physical education, sciences, social sciences, or Spanish.

Early Childhood Education
(Nursery and Kindergarten)

In addition to certification in grades one through six, requirements may be met for certification in early childhood education. Requirements are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDEL 401</td>
<td>Programs in Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 402</td>
<td>Developmental Processes in Early Childhood</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 403</td>
<td>Language and Cognition of Young Children</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 404</td>
<td>Organization of Instruction in Nursery Kindergarten Education</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>

Professional Laboratory Experience

Practical laboratory experiences in Teacher Education Centers will be scheduled for elementary education majors during two quarters of the junior year (Phase II). Daily participation at a Center is required for approximately one-half day of a school day; with a prescribed sequence of courses scheduled concurrently for the other one-half day.

Practical experience also occurs in the senior year. The student is enrolled full time for one quarter in a public elementary school under the direction of a selected teacher.

SECONDARY EDUCATION

The Secondary Education Programs are designed for students interested in the development and education of adolescents. Students majoring in secondary education are certified to teach an academic subject(s) in grades seven through twelve upon graduation and receipt of a state teacher's certificate. Areas of study required are: (1) Environmental Studies (69 quarter hours); (2) Professional Preparation (39-42 quarter hours); (3) Academic Specialization (51-63 quarter hours); and (4) Electives which vary according to major.
Required Professional Preparation Courses

Phase I—Analysis

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA 206</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 307</td>
<td>5</td>
</tr>
</tbody>
</table>

Phase II—Developmental

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDSE 303</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>EDSE 305</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 306-309, 405-409</td>
<td>4-7</td>
</tr>
<tr>
<td>EDTA 305</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 306</td>
<td>3</td>
</tr>
<tr>
<td>EDPL 407</td>
<td>3</td>
</tr>
</tbody>
</table>

Phase III—Application

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPL 407</td>
<td>9</td>
</tr>
<tr>
<td>EDPL 408</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 304</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>39-42</td>
</tr>
</tbody>
</table>

* For K-12 certification only.

Professional Laboratory Experience

Majors in Secondary Education will be provided one half day of practical laboratory experiences in Teacher Education Centers during one quarter of the junior year. A prescribed sequence of courses will be scheduled concurrently.

Practical experience also occurs in the senior year. The student is enrolled full time for one quarter in a public junior or senior high school under the direction of a selected teacher.

Academic Specializations

Academic Specializations are offered in: biology, business education, chemistry, English, foreign languages, mathematics, physical education, physics, and social sciences.

In addition to completing the requirements in Environmental Studies, Professional Preparation, and selected electives, one of the following areas of academic specialization must be completed to satisfy requirements for graduation and certification:

Biology Specialization

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 100,101</td>
<td>General Biology (3,1) 4</td>
</tr>
<tr>
<td>BIOL 360</td>
<td>Genetics       4</td>
</tr>
<tr>
<td>BIOL 481 or</td>
<td></td>
</tr>
<tr>
<td>EDSE 481</td>
<td>Contemporary Biology 3</td>
</tr>
<tr>
<td>BOT 100,101</td>
<td>General Botany (3,1) 4</td>
</tr>
</tbody>
</table>
CHEM 111,112,113 General Chemistry (4,3,3) 10
CHEM 114,115 General Chemistry Laboratory (1,1) 2
MICR 200,201 General Microbiology (3,1) 4
ZOOD 100,101 General Zoology (3,1) 4
ZOOD 234 Anatomy and Physiology 5

Classification (one course) 4

BOT 345 Plant Taxonomy (4)
ZOOD 340 Taxonomy of the Vertebrates (4)
ZOOD 345 General Entomology (4)

Environment (one course) 4

BOT 350 Plant Ecology (4)
ZOOD 350 Animal Ecology (4)

General Biology Electives

<table>
<thead>
<tr>
<th>Suggested Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 460</td>
<td>Principles of Adaptation (3)</td>
</tr>
<tr>
<td>MICR 300</td>
<td>Advanced General Microbiology (4)</td>
</tr>
<tr>
<td>MICR 322</td>
<td>Microbiology of Water and Sewage (4)</td>
</tr>
<tr>
<td>ZOOD 240</td>
<td>Invertebrate Zoology (5)</td>
</tr>
<tr>
<td>ZOOD 400</td>
<td>Advanced Animal Biology (2)</td>
</tr>
</tbody>
</table>

ELECTIVES 27

Certification in General Science may also be attained by completing PHYS 103, Astronomy; or GEOL 100,101, Physical Geology, in addition to the requirements in biology specialization.

Business Education Specialization

Comprehensive Curriculum

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 101,102,103</td>
<td>Basic Concepts (3,3,3)</td>
<td>9</td>
</tr>
<tr>
<td>BADM 371</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>*ECON 203</td>
<td>Principles of Economics</td>
<td>3</td>
</tr>
<tr>
<td>**EDBE 101</td>
<td>Introductory Typewriting (3)</td>
<td>3</td>
</tr>
<tr>
<td>**EDBE 102,103</td>
<td>Communications Production I,II (3,3)</td>
<td>3-6</td>
</tr>
<tr>
<td>**EDBE 201,202,203</td>
<td>Principles of Shorthand I,II,III (3,3,3)</td>
<td>0-9</td>
</tr>
<tr>
<td>EDBE 301</td>
<td>Shorthand Dictation</td>
<td>3</td>
</tr>
<tr>
<td>EDBE 302</td>
<td>Shorthand Transcription</td>
<td>3</td>
</tr>
<tr>
<td>EDBE 305</td>
<td>Office Technology</td>
<td>3</td>
</tr>
<tr>
<td>EDBE 405</td>
<td>Principles of Business—Vocational Education</td>
<td>3</td>
</tr>
<tr>
<td>EDBE 406</td>
<td>Office Systems and Procedures</td>
<td>3</td>
</tr>
<tr>
<td>ENG 301</td>
<td>Professional Report Writing</td>
<td>3</td>
</tr>
<tr>
<td>ELECTIVES</td>
<td></td>
<td>21</td>
</tr>
</tbody>
</table>

*ECON 201,202, Principles of Economics are prerequisites.

**May be exempted, but Business Administration courses must be selected as replacements for courses exempted.

Basic Business and Accounting Curriculum*

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 101,102,103</td>
<td>Basic Concepts (3,3,3)</td>
<td>9</td>
</tr>
<tr>
<td>ACCY 311,312</td>
<td>Intermediate Accounting (3,3)</td>
<td>6</td>
</tr>
<tr>
<td>BADM 371</td>
<td>Business Law</td>
<td>3</td>
</tr>
</tbody>
</table>
**ECON 203**  Principles of Economics  3
**ECON 411**  Comparative Economic Systems  3
***EDBE 101**  Introductory Typewriting (3)  3
***EDBE 102,103**  Communications Production I,II (3,3)  3-6
EDBE 305  Office Technology  3
EDBE 405  Principles of Business—  
Vocational Education  3
ENG 301  Professional Report Writing  3
MGMT 301  Management  5
MKTG 301  Marketing  5
ELECTIVES  20

*Excludes courses in and related to shorthand instruction.
***ECON 201,202, Principles of Economics are prerequisites.
***May be exempted, but Business Administration courses must be selected as replacements.

**Chemistry Specialization**

<table>
<thead>
<tr>
<th>Chemistry Requirements</th>
<th>(57 Quarter Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121,122,123</td>
<td>Organic Chemistry (4,3,3) 10</td>
</tr>
<tr>
<td>CHEM 124,125</td>
<td>Organic Laboratory Techniques (2,2) 4</td>
</tr>
<tr>
<td>CHEM 261,262,263</td>
<td>Chemistry Fundamentals (3,3,3) 9</td>
</tr>
<tr>
<td>CHEM 351,352</td>
<td>Analytical Laboratory Techniques (3,3) 6</td>
</tr>
<tr>
<td>CHEM 451,452</td>
<td>Analytical Laboratory Techniques (3,3) 6</td>
</tr>
<tr>
<td>CHEM 491 or EDSE 492</td>
<td>Contemporary Chemistry 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mathematics Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*MATH 110</td>
<td>Elementary Functions 5</td>
</tr>
<tr>
<td>MATH 221,222,223</td>
<td>Calculus with Analytical Geometry (4,5,5) 14</td>
</tr>
<tr>
<td>ELECTIVES</td>
<td>30</td>
</tr>
</tbody>
</table>

Certification in Mathematics may also be completed by taking a total of 32 quarter hours in Mathematics including the requirements for Chemistry.

*May be exempted.

**English Language Arts Specialization**

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>(60 Quarter Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Composition</strong></td>
<td></td>
</tr>
<tr>
<td>ENG 101,102,103</td>
<td>Composition (3,3,3) 9</td>
</tr>
<tr>
<td>ENG 300</td>
<td>Expository Writing  3</td>
</tr>
<tr>
<td><strong>ENG 498</strong></td>
<td>Undergraduate Seminar 3</td>
</tr>
<tr>
<td><strong>Literature</strong></td>
<td></td>
</tr>
<tr>
<td>ENG 210</td>
<td>Principles of Literature 3</td>
</tr>
<tr>
<td>ENG 211,212,213</td>
<td>Survey of English Literature (3,3,3) 12</td>
</tr>
<tr>
<td>ENG 311,312,313</td>
<td>Survey of American Literature (3,3,3) 9</td>
</tr>
<tr>
<td>ENG 465</td>
<td>Literature for Adolescents 3</td>
</tr>
</tbody>
</table>

| **History and Development of Language** | |
| ENG 371           | General Linguistics 3 |
| ENG 471           | History of the English Language 3 |
| ENG 472           | Modern English Grammar 3 |

| **Reading** | |
| EDSE 415     | Reading in the Secondary School 3 |

| **Speech** | |
| SPE 101     | Fundamentals of Oral Communication 3 |
| SPE 463     | Studies in Listening 3 |
| ELECTIVES  | 24 |
Certification in Journalism may be completed by taking COM 100—Basic Communications and 9 quarter hours in Journalism including the requirements for English.

Certification in Speech may be completed by taking COM 100—Basic Communications (3), THA 180—Study of Drama and Theater or THA 290—Interpretation I (3), SPE 261—English Phonetics and American Dialects (3), and six elective quarter hours in Speech including the requirements for English.

**Students will be assigned to the English freshman composition staff for one quarter during the senior year for practical laboratory experiences**

Foreign Language Specialization—French

*Basic Courses*  
FRE 101,102,103  Elementary French Language and Civilization (3,3,3) 9  
FRE 201,202,203  Intermediate French Language and Civilization (3,3,3) 9

*Required Courses*  
FRE 301  French Composition 4  
FRE 303  French Conversation 4  
FRE 311,312,313  Survey of French Literature (3,3,3) 9  
FRE 401  French Phonetics and Diction 2  
FRE 498  Undergraduate Seminar 3  
FRE 300,400  French Electives 18

Certification in a second language may be completed by taking 27 quarter hours in that language including the requirements for French.

*May be exempted.

Foreign Language Specialization—Spanish

*Basic Courses*  
SPA 101,102,103  Elementary Spanish Language and Civilization (3,3,3) 9  
SPA 201,202,203  Intermediate Spanish Language and Civilization (3,3,3) 9

*Required Courses*  
SPA 301  Spanish Composition 4  
SPA 303  Spanish Conversation 4  
SPA 311,312,313  Survey of Spanish Literature (3,3,3) 9  
SPA 401  Spanish Phonetics and Diction 2  
SPA 498  Undergraduate Seminar 3  
SPA 300,400  Spanish Electives 18

Certification in a second language may also be completed by taking 27 quarter hours in that language including the requirements for Spanish.

*May be exempted.

Library and Audiovisual Services Specialization*

*Required Courses*  
EDEL 307  Literature for Children 3  
ENG 465  Literature for Adolescents 3  
LIB 301  Library Materials 3

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*Teacher education majors (elementary or secondary) may add Library and Audio-visual Services certification to the Rank III certificate by successful completion of the courses prescribed in this area.

**Mathematics Specialization**

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>(54 Quarter Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*MATH 110</td>
<td>Elementary Functions</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Finite Mathematics</td>
</tr>
<tr>
<td>MATH 221,222,223</td>
<td>Calculus with Analytical Geometry (4,5,5)</td>
</tr>
<tr>
<td>MATH 315</td>
<td>Introduction to Number Theory</td>
</tr>
<tr>
<td>MATH 318</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td>MATH 351,352</td>
<td>Foundations of Geometry (3,3)</td>
</tr>
<tr>
<td>MATH 411</td>
<td>Algebraic Structures</td>
</tr>
<tr>
<td>MATH 491 or</td>
<td>Contemporary Mathematics</td>
</tr>
<tr>
<td>EDSE 493</td>
<td>Theory of Probability and Statistics</td>
</tr>
<tr>
<td>STAT 341</td>
<td>Computer Programming</td>
</tr>
<tr>
<td>COMP 102</td>
<td>Electives</td>
</tr>
<tr>
<td>MATH or STAT ELECTIVES</td>
<td></td>
</tr>
</tbody>
</table>

*May be exempted.

**Physics Specialization**

<table>
<thead>
<tr>
<th>Physics Requirements</th>
<th>(58 Quarter Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 211,212,213</td>
<td>General Physics (4,3,3)</td>
</tr>
<tr>
<td>PHYS 282,283</td>
<td>Physics Laboratory (1,1)</td>
</tr>
<tr>
<td>PHYS 227,228</td>
<td>Classical Mechanics (3,3)</td>
</tr>
<tr>
<td>PHYS 287,288</td>
<td>Physical Measurements (3,3)</td>
</tr>
<tr>
<td>PHYS 347,348</td>
<td>Concepts in Modern Physics (3,3)</td>
</tr>
<tr>
<td>PHYS 357,358</td>
<td>Wave Motion and Optics (3,3)</td>
</tr>
<tr>
<td>PHYS 491 or</td>
<td>Contemporary Physics</td>
</tr>
<tr>
<td>EDSE 494</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mathematics Requirements</th>
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</thead>
<tbody>
<tr>
<td>*MATH 110</td>
<td>Elementary Functions</td>
</tr>
<tr>
<td>MATH 221,222,223</td>
<td>Calculus with Analytical Geometry (4,5,5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTIVES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

Certification in Mathematics may also be completed by taking a total of 24 quarter hours in Mathematics including the requirements for Physics.

*May be exempted.
Social Sciences

Required Courses  (63 Quarter Hours)

Core

<table>
<thead>
<tr>
<th>Course</th>
<th>(3,3)</th>
<th>(3,3)</th>
<th>(3,3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON</td>
<td>Principles of Economics</td>
<td>Western Culture and Civilization</td>
<td>American History</td>
</tr>
<tr>
<td>HIST</td>
<td>201, 202</td>
<td>201, 202, 203</td>
<td>311, 312, 313</td>
</tr>
<tr>
<td>HIST</td>
<td>201</td>
<td>201, 202, 203</td>
<td>311, 312, 313</td>
</tr>
<tr>
<td>PCL</td>
<td>301</td>
<td>341</td>
<td>401</td>
</tr>
<tr>
<td>SOC</td>
<td>201, 202</td>
<td>201</td>
<td>311, 312, 313</td>
</tr>
<tr>
<td>SOC</td>
<td>416</td>
<td>201</td>
<td>311, 312, 313</td>
</tr>
</tbody>
</table>

Discipline  9

Student selects 9 quarter hours upper level work from one discipline specialization which may include Economics, History, Political Science or Sociology.

Concept  12

Student selects 12 quarter hours of course work to develop a specialization concept. Suggested topics are: American Studies; World Cultures; Human Ecology; Urban Studies; Science and Culture; and World Realities. Course work must be approved by student adviser.

ELECTIVES  30

PHYSICAL EDUCATION

The Physical Education Program offers a comprehensive curriculum designed to certify a student to teach as a physical education specialist in grades one through twelve. Areas of study required are: (1) Environmental Studies, 69 quarter hours; (2) General Professional Preparation, 39 quarter hours; (3) area of specialization, 52 quarter hours; and (4) Electives, 24 quarter hours.

Physical Education Specialization  (52 Quarter Hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>(52 Quarter Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZOOL</td>
<td>Anatomy and Physiology</td>
</tr>
<tr>
<td>EDPE</td>
<td>Rehabilitation Training Techniques</td>
</tr>
<tr>
<td>EDPE</td>
<td>Administration and Coaching</td>
</tr>
<tr>
<td>EDPE</td>
<td>School and Community Recreation</td>
</tr>
<tr>
<td>EDPE</td>
<td>Human Performance Learning</td>
</tr>
<tr>
<td>EDPE</td>
<td>Kinesthetics</td>
</tr>
<tr>
<td>EDPE</td>
<td>Exercise Physiology – Cardiovascular</td>
</tr>
<tr>
<td>EDPE</td>
<td>Exercise Physiology— Cardiorespiratory</td>
</tr>
<tr>
<td>EDPE</td>
<td>Instructional Analysis in Tennis</td>
</tr>
<tr>
<td>EDPE</td>
<td>Instructional Analysis in Aquatics</td>
</tr>
<tr>
<td>EDPE</td>
<td>Instructional Analysis in Gymnastics and Tumbling</td>
</tr>
<tr>
<td>EDPE</td>
<td>Instructional Analysis in Golf</td>
</tr>
<tr>
<td>EDPE</td>
<td>Instructional Analysis in Wrestling (M)</td>
</tr>
<tr>
<td>EDPE</td>
<td>Choreography of Contemporary Dance (W)</td>
</tr>
<tr>
<td>EDPE</td>
<td>Rhythms, Notation, Meter and Form</td>
</tr>
<tr>
<td>EDPE</td>
<td>Organization and Administration of Secondary School Physical Education</td>
</tr>
<tr>
<td>EDPE</td>
<td>Organization and Administration of Elementary School Physical Education</td>
</tr>
</tbody>
</table>
Required Professional Preparation Courses:

Physical Education Major students will be required to successfully complete the Required Professional Courses (Phases I, II and III) outlined on the preceding pages. Physical Education Major students in Phase II will be provided a teaching-coaching experience in a Teacher Education Center during one quarter of their junior year; the courses listed in Phase II — Developmental, will be scheduled concurrently. An additional laboratory experience occurs in the senior year (Phase III). The student is enrolled, full time, for one quarter as a student teacher in an accredited elementary or secondary school under the direction of a selected supervising teacher.

Health Education

In addition to physical education certification in grades one through twelve, students may be certified in Health Education.

Certification requirements are:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDPE 407</td>
<td>Family Living Concepts</td>
<td>5</td>
</tr>
<tr>
<td>EDPE 408</td>
<td>Contemporary Health Hazards</td>
<td>5</td>
</tr>
<tr>
<td>MICR 200</td>
<td>General Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MICR 201</td>
<td>General Microbiology Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

One of the Following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEES 417</td>
<td>Environmental Health</td>
</tr>
<tr>
<td>MICR 220</td>
<td>Sanitary Sciences and Public Health</td>
</tr>
</tbody>
</table>

POST-BACCALAUREATE CERTIFICATION

Individuals who have previously earned a bachelor’s degree from a standard institution may qualify for a Florida teaching certificate by fulfilling state requirements in Professional Preparation and Specialization. A standard institution is defined and certification requirements are outlined in *Florida Requirements for Teacher Certification* adopted by the State Board of Education.

Specialization Requirements may be met if the applicant has a college major listed in the certification regulations; otherwise, certification requirements listed in Sections 7-35 (Florida Requirements for Teacher Certification) must be completed.

Professional Preparation requirements include a combination of professional education and practical experience courses. The practical experience specifications may be met in a combination of several ways and each is outlined in Section 6 — (2) — 1, 2, 3 of the Requirements. Professional preparation includes course work in: (1) Foundations of
Education; (2) General Methods, Administration, Supervision and Curriculum; and (3) Special Methods. Courses designed to fulfill State Department of Education specifications are as follows:

1. Foundations of Education
   - EDTA 405 Teaching Analysis
   - EDTA 406 Human Development
   - EDTA 407 Learning Theory

2. General Methods, Administration, Supervision and Curriculum
   - EDEL 455 Elementary School Curriculum
   - EDPL 409 Teaching Strategies
   - EDSE 475 Secondary School Curriculum

3. Special Methods
   - EDEL 312 Reading in the Elementary School
   - EDSE 478 Instructional Analysis in Business
   - EDSE 479 Instructional Analysis in English
   - EDSE 485 Instructional Analysis in Foreign Language
   - EDSE 486 Instructional Analysis in Mathematics
   - EDSE 487 Instructional Analysis in Physical Education
   - EDSE 488 Instructional Analysis in Science
   - EDSE 489 Instructional Analysis in Social Science

4. Practical Experience
   - EDPL 465 Teaching Practicum
   - EDPL 466 Teaching Practicum

MASTER OF EDUCATION DEGREE

The College of Education offers graduate work leading to the Master of Education degree. The programs are designed primarily to improve teaching competencies in several selected areas. In addition, it meets the Florida Rank II Certification requirements. Programs of study are available for most of the Florida Certification Teaching Specializations. Each is designed to develop a high level of teaching proficiency for those persons who have daily contact with pupils in the classroom. The purposes are to (a) expand the teacher's background in social factors, human development factors, and learning factors, all of which form the rationale for American education in the total school curriculum; (b) improve the teacher's proficiency in curriculum planning and instructional techniques; and (c) extend the teacher's knowledge in his area of specialization.

Admission Requirements

To meet the basic requirements for admission, a student must have:

1. A bachelor's degree
2. The basic course work requirements for a regular Rank III Florida Teaching Certificate

3. An over-all 2.8 grade point average (on a 4-point scale) in undergraduate courses. Students seeking admission with less than a 2.8 average may be admitted provisionally upon the recommendation of the Dean of the College and approval of the Graduate Council. Provisional admission may be removed by maintaining a cumulative grade point average of 3.0 based on the first 12 credits of graduate study.

4. Test score results from the aptitude section of the Graduate Record Examination (GRE) are required. However, if an applicant misses one of the scheduled dates for the GRE; results of the Miller Analogies Test may be submitted at the time of application for admission, (See Graduate Studies Bulletin).

Planned Program

Each graduate student is assigned a graduate committee consisting of three members from the area which offers the program of his selected specialization. Degree programs must be planned by the student and his committee chairman (major professor) prior to enrollment in a second quarter of graduate study. A student wishing to take credit from another institution or from Continuing Education enrolls in courses at his own risk prior to having an approved program on file with the Dean of the College of Education.

Residence, Continuing Education, and Transfer of Graduate Credit

At least 27 quarter hours of graduate credit must be earned in residence at Florida Technological University. Of the minimum 45 quarter hours required for a degree, 12 may be taken through Continuing Education. Ordinarily, no more than 9 quarter hours of "B" or better work may be transferred from another institution. Any exceptions must be recommended by the Dean of the College and approved by the Graduate Council.

Admission to Candidacy

A student may become a candidate for the Master of Education Degree by completing 25 quarter hours of graduate work in a planned program with a 3.0 (B) or higher grade point average and by submitting acceptable scores from the aptitude section of the Graduate Record Examination.
Applications for Admission to Candidacy are available in the office of the Dean of the College of Education and must be submitted during the quarter the student is completing the 25th credit hour of his program.

Degree Requirements

The planned program requires a minimum of 45 quarter hours of graduate course work credit. Course work beyond the 45 hours may be prescribed by the student's graduate committee where prerequisites are necessary, and/or course deficiencies are apparent. A "B" (3.0) average must be maintained in all graduate courses; no more than 9 hours of "C" may be counted toward the degree.

During the 1969-70 academic year the College of Education will offer two graduate courses each quarter from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA 601</td>
<td>Social Factors in American Education</td>
<td>(3)</td>
</tr>
<tr>
<td>EDTA 602</td>
<td>Education, Human Development and Learning</td>
<td>(3)</td>
</tr>
<tr>
<td>EDTA 603</td>
<td>Measurement and Evaluation in Education</td>
<td>(3)</td>
</tr>
<tr>
<td>EDTA 604</td>
<td>Research Design and Techniques in Education</td>
<td>(3)</td>
</tr>
<tr>
<td>EDEL 630</td>
<td>Trends in Elementary School Reading</td>
<td>(3)</td>
</tr>
<tr>
<td>EDSE 601</td>
<td>Curriculum Planning in Secondary Schools</td>
<td>(3)</td>
</tr>
<tr>
<td>EDBE 602</td>
<td>Curriculum Innovations in Business Education</td>
<td>(3)</td>
</tr>
<tr>
<td>EDPE 601</td>
<td>Philosophical Foundation of Physical Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Alternates

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDBE 602</td>
<td>Curriculum Innovations in Business Education</td>
<td>(3)</td>
</tr>
<tr>
<td>EDPE 601</td>
<td>Philosophical Foundation of Physical Education</td>
<td>(3)</td>
</tr>
</tbody>
</table>
COLLEGE OF ENGINEERING

The College of Engineering offers degree programs in engineering and physics. Engineering and Physics curricula at Florida Technological University are directed toward professional objectives. These objectives are best met by completing the bachelor's degree program followed by professional education at the graduate level.

The satisfactory completion of a curriculum of a minimum of 192 quarter hours, including environmental studies courses, an engineering or physics core curriculum, and both required and elective courses of study in a selected area of concentration of the student's choice, leads to the degree of Bachelor of Science in Engineering, or Bachelor of Science in Physics. Graduates of the College of Engineering may pursue a wide variety of careers in private practice, industry, education, and government. The programs of study offered by the College are designed to assist the student in the attainment of his professional career objectives through sound academic preparation.

Admission

Students who wish to be admitted to full freshman standing in the College should present certain secondary school units in addition to the minimum University requirements. A total of 3½ units is required in mathematics, including advanced algebra, geometry, and trigonometry. Calculus is recommended. The laboratory sciences chosen must include at least one unit in physics and one in chemistry. One unit of biology is strongly recommended.

Students who have omissions or deficiencies in subject matter preparation may be required to complete additional university credit course work which may not be applied toward an engineering or physics degree. The most common deficiencies that must be removed before beginning regular engineering or physics course work are algebra, trigonometry, general physics, English and general chemistry.

Subject to the general grade and residence requirements of the University, provisional credit will be granted for transferred course work equivalent to that required in Florida Technological University's engineering or physics programs. These provisional credits will become final only after the student has demonstrated his ability to do satisfactory work at the University. Transfer credits in pre-engineering from a junior college will be used to satisfy freshman and sophomore level requirements.
only. The status of a student and the specific credits acceptable toward his degree will be determined by the Dean of the College.

Students who are well prepared usually will be able to complete the program of study leading to the degree of Bachelor of Science in Engineering or Bachelor of Science in Physics in four years. In cases of inadequate secondary school preparation or other extenuating circumstances, the undergraduate program may be extended beyond the normal four-year period.

**General Information**

Prior to enrolling in courses at the 300 level, each engineering student must: (1) receive approval from the office of the Dean of Engineering, and (2) secure from his adviser an approved course of study for his remaining work. Generally, students with a 2.00 scholarship index (C average), or higher will receive approval.

Counseling is provided in order that the student may be aided in making his choice of major. Required and elective courses for each area are listed later in this Bulletin and changes or substitutions may be made only with the approval of the Dean.

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean. The Dean may assign supplementary work, including additional course work, consistent with the needs of the student. The granting of a degree may be delayed until the work is satisfactorily completed.

**BACHELOR OF SCIENCE IN ENGINEERING DEGREE PROGRAM**

Engineering is one of the most important evolutionary forces in civilization today. The professional engineer should assume a leading role not only in the conceptual and planning stages but also in the design, manufacturing, construction, operation, and management phases of various engineering facilities and programs. At the same time, the professional engineer should understand that engineering innovation is a means of solving problems in our society and accept a large measure of social responsibility for significant engineering developments.

The professional engineer is the key individual in a team of technical specialists which includes engineering design specialists, engineering operations and management specialists, and engineering technicians. It is the purpose of Florida Technological University's engineering program to provide the broad university level educational opportunities requisite for
preparing qualified individuals to make effective contributions through careers in engineering and applied science in our technologically oriented society.

The principal areas of concentration in the engineering curriculum are devoted to the basic sciences, mathematics, the fundamentals of engineering problems. These courses are not training courses for any of the mechanical or manipulative skills, but rather, are planned to provide preparation for development, planning, design, research, graduate work, and with certain electives, for operation, production, testing, maintenance and management. For assistance and counsel in planning a program, each student will be assigned an adviser from the instructional staff in his chosen area of interest.

The degree requirements consist of:

1. Environmental Studies Program
   Advanced (14)  Quarter Hours  69

2. Engineering Core  98

3. Technical Electives or Area of Concentration Courses  192
   Total  25

Technical electives within a chosen specialization are selected with the approval of the student’s faculty adviser and may be made from 300 level courses or above in engineering, mathematics, the sciences, business administration or a foreign language.

ENGINEERING CORE REQUIREMENTS*

The engineering core consists of basic engineering sciences subject matter and is common to all areas of concentration. Because this requirement is a substantial part of the Bachelor’s degree program, it gives the student time to become adjusted, and to choose, if he wishes, a field of specialization for which he is best suited, or to complete the degree program with a selection of diversified subjects.

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 102</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 103</td>
<td>3</td>
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<td>ENGR 111</td>
<td>3</td>
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<td>ENGR 151,152</td>
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<td>MATH 221,222,223</td>
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<tr>
<td>ENGR 201,202,203</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 221</td>
<td>4</td>
</tr>
<tr>
<td>Computer Programming</td>
<td></td>
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<tr>
<td>Engineering Graphics</td>
<td></td>
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<tr>
<td>Creative Design</td>
<td></td>
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<tr>
<td>Engineering Concepts</td>
<td></td>
</tr>
<tr>
<td>Chemical Foundations of Engine</td>
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</tr>
<tr>
<td>Calculus with Analytical Geometry</td>
<td></td>
</tr>
<tr>
<td>Engineering Design Case Studies</td>
<td></td>
</tr>
<tr>
<td>Engineering Analysis — Statics</td>
<td></td>
</tr>
<tr>
<td>Electrical Science</td>
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98
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MATH 321</td>
<td>Intermediate Calculus and Analytic Geometry</td>
<td>5</td>
</tr>
<tr>
<td>ENGR 311</td>
<td>Engineering Analysis — Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 312</td>
<td>Mechanics of Materials</td>
<td>5</td>
</tr>
<tr>
<td>ENGR 321</td>
<td>Principles of Electrical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 322</td>
<td>Electrical Networks</td>
<td>4</td>
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<tr>
<td>ENGR 323</td>
<td>Electronic Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 331</td>
<td>Thermodynamics</td>
<td>4</td>
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<tr>
<td>ENGR 332</td>
<td>Fluid Mechanics</td>
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<td>ENGR 341</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 342</td>
<td>Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 351</td>
<td>Structure and Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 352</td>
<td>Materials of Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 361</td>
<td>Man and His Environment</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 371</td>
<td>Probability and Statistics for Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 331</td>
<td>Differential Equations</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 344</td>
<td>Modern Physics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 354</td>
<td>Optics and Wave Motion for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 431</td>
<td>Transport Processes</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 441</td>
<td>Technical Communications</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 442</td>
<td>Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 443</td>
<td>Engineering Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

*Satisfies Science and Mathematics requirements of the Environmental Studies Program.

### TYPICAL BSE PROGRAM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 102</td>
<td>Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Engineering Graphics; Creative Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 111</td>
<td>Engineering Concepts</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 151</td>
<td>Chemical Foundations of Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATII 221</td>
<td>Calculus with Analytical Geometry</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Environmental Studies Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Environment Courses</td>
<td>3</td>
</tr>
<tr>
<td>SPE 101</td>
<td>Fundamentals of Oral Communication</td>
<td>3</td>
</tr>
</tbody>
</table>

**First Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 201</td>
<td>Engineering Design Case Studies</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 211</td>
<td>Engineering Analysis — Statics, Dynamics, Mechanics of Materials</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 341</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 361</td>
<td>Man and His Environment</td>
<td>3</td>
</tr>
<tr>
<td>MATH 321</td>
<td>Intermediate Calculus and Analytic Geometry</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 354</td>
<td>Optics and Wave Motion for Engineers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social Environment Courses</td>
<td>3</td>
</tr>
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</table>

**Second Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENGR 321</td>
<td>Principles of Electrical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 332</td>
<td>Electronic Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 341</td>
<td>Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 342</td>
<td>Transport Processes</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 371</td>
<td>Probability and Statistics for Engineers</td>
<td>3</td>
</tr>
</tbody>
</table>

**Third Year**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 321</td>
<td>Principles of Electrical Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 332</td>
<td>Electronic Engineering</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 341</td>
<td>Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 371</td>
<td>Probability and Statistics for Engineers</td>
<td>3</td>
</tr>
</tbody>
</table>
ENGR 351,352 Structure & Properties of Materials; Materials of Engineering 3 3
Area of Concentration electives 3
HUM 301,302,303 Western Humanities 3 3 3
17 17 16

Fourth Year
ENGR 443 Engineering Administration 3
ENGR 442 Operations Research 3 3
Area of Concentration electives 7 7 8
Environmental Studies — Advanced Subjects 3 3
PHYS 344 Modern Physics for Engineers 3
Senior Seminar 2 2 4
15 15 15

BACHELOR OF SCIENCE IN PHYSICS DEGREE PROGRAM

The curriculum in physics provides an understanding of the basic principles of classical and modern physics. Emphasis will be on the understanding of fundamental concepts through quantitative and analytical reasoning. The program of study leading to the Bachelor of Science degree in Physics enables students to acquire proficiency in theoretical physics; it also exposes them to modern laboratory experimentation, equipment, and techniques. Students completing the undergraduate program in physics will find many opportunities for employment in government, industry, and education; or they may continue their training at the graduate level.

In addition to providing a major in physics, the Department of Physics offers courses for: (1) prospective teachers of physics in secondary schools, (2) students who require a physics background as preparation for work in other fields, and (3) students who desire a general cultural education in selected fields of physics.

The degree requirements consist of:

1. Environmental Studies Program 69
2. Physics Core 73
3. Restricted Electives 27
4. Electives 23
Total 192

Required courses leading to the Bachelor of Science degree in Physics are identified by course number in the curriculum which appears below.

TYPICAL BS PHYSICS PROGRAM

<table>
<thead>
<tr>
<th>First Year</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 102 Computer Programming</td>
<td>3</td>
<td></td>
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<tr>
<td>ENGL 101 Composition I</td>
<td></td>
<td>3</td>
<td></td>
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<tr>
<td>SPE 101 Fundamentals of Oral Communication</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MATH 221,222,223 Calculus with Analytic Geometry</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Course</td>
<td>Credits</td>
<td>Credits</td>
<td>Credits</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>CHEMISTRY</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211,212,213</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<tr>
<td>PHYS 282,283</td>
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<td>18</td>
<td>16</td>
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</table>

**Second Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives*</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>HUM 301,302,303</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Social Environment**</td>
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<td>3</td>
<td>3</td>
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<tr>
<td>MATH 321,331,317</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 321,322,323</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>16</td>
<td>15</td>
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</table>

**Third Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 341 Theory of Probability and Statistics</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Studies — Advanced Subjects</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Social Environment**</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Senior Seminar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 331,332,333</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 341,342,343</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 381,382,383</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>15</td>
<td>17</td>
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</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Senior Seminar</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Restricted Elective***</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

*A year of Biological Sciences is strongly recommended.

**Option B is strongly recommended for students expecting to enter graduate school. Such a student should seriously consider electing an additional 3 hours of the language he has chosen (Russian, German or French).

***Physics Majors must take 27 quarter hours of electives in Mathematics or Physics at the 300 level or higher. All electives must be approved by the student’s adviser. These will normally be taken from PHYS 335, 336, 351, 362, 384, 385, 461, 471, 472, 475 and MATH 341, 425, 434, 436.

**ACADEMIC AREAS**

The College of Engineering is giving primary emphasis to the following academic areas and subdisciplines:

**Civil Engineering and Environmental Sciences**


**Electrical Engineering and Communication Sciences**

Engineering Materials Sciences


Industrial Engineering and Management Systems


Mechanical Engineering and Aerospace Sciences


Physics

Atomic and Molecular Physics, Biological Physics, Low Temperature Physics, Magnetic Resonance, Quantum Optics and Electronics, and Solid State Physics.

Course work from these areas may be used to satisfy the area of concentration or restricted elective requirements of the degree programs in the College with the approval of a faculty adviser and the Dean.

Several interdisciplinary programs are available to selected students who desire to prepare for some very specialized professional objective. Interested students should consult the Dean for the appointment of a faculty adviser knowledgeable in the special interdisciplinary area. Programs presently available include:

- Biomedical Engineering
- Engineering Design
- Engineering Operations
- Engineering Physics
- Systems Engineering
The College of Humanities and Social Sciences endeavors to fulfill with the other four colleges of the University the general aim of Florida Technological University. This College has the responsibility of training specialists in the principle disciplines of the humanities and the social sciences. The following major study programs are presently offered: art, communications (journalism, radio-TV, speech, theatre), economics, English, foreign languages (French, Spanish), history, humanities, music, political science, psychology, and sociology. Besides these majors, courses are offered in German, library science, philosophy, religion, and Russian.

In addition to training specialists in the various disciplines of the College, the College of Humanities and Social Sciences will cooperate with the other four colleges of Florida Technological University in the Environmental Studies Program and in offering electives suitable to students in each of the five colleges.

A student enrolled in the College of Humanities and Social Sciences must fulfill all of the University requirements and the requirements set by the department of his major.

MAJOR IN ART

The curriculum in art provides thorough grounding in visual expression and an opportunity for specialized professional preparation in art history and in the studio areas of design, sculpture, photography, and painting. The student's program should be established in consultation with an adviser from the area of concentration.

For a major in art with art history concentration, a minimum of 45 quarter hours in art courses is required. These courses should include 30 quarter hours in art history courses, 9 quarter hours of design courses, and 6 quarter hours of approved cognate courses. A satisfactory grade in a comprehensive art history examination in the senior year and reading knowledge of one foreign language are required.

A major in art with studio concentration requires a minimum of 60 quarter hours in art courses or approved cognates, of which 15 must be taken in an area of specialization and 12 in art history. During the first two years, students should complete 30 quarter hours in art courses, including the following:
ART 201, 202, 203 Design (3,3,3)
ART 204, 205, 206 Drawing (3,3,3)
ART 207 20th Century Art (3)
ART 208 Ancient and Medieval Art (3)
ART 209 Renaissance, Baroque, and 19th Century Art (3) or
ART 210 Oriental Art (3)

A senior exhibition acceptable to the art faculty is required.

The university reserves the right to hold for exhibition purposes work done in classes.

The table below illustrates the requirements for a major in ART with a studio concentration:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td></td>
</tr>
<tr>
<td>Basic (55)</td>
<td>69</td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td></td>
</tr>
<tr>
<td>Art (48)</td>
<td>60</td>
</tr>
<tr>
<td>Allied Courses (12)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>183</td>
</tr>
</tbody>
</table>

The table below illustrates the requirements for a major in ART with an art history concentration:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td></td>
</tr>
<tr>
<td>Basic (55)</td>
<td>69</td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td></td>
</tr>
<tr>
<td>Art (39)</td>
<td>45</td>
</tr>
<tr>
<td>Allied Courses (6)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
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</tr>
<tr>
<td>Total</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>183</td>
</tr>
</tbody>
</table>

MAJOR IN COMMUNICATIONS

The Department of Communications affords the student an opportunity to concentrate in the areas of communications with emphasis in journalism, radio-television, speech, or theatre.

A major in communications requires a minimum of 48 quarter hours including the following course:
COM 100  Basic Communications (3)

Any student contemplating graduate studies should be aware of foreign language requirements in graduate schools when planning his undergraduate program.

Students may select from the following two programs of study to complete the requirements for a major in communications:

EMPHASIS PROGRAM:

In the student's over-all program in communications, 30-36 quarter hours must be elected in an area of emphasis, whether journalism, radio-television, speech, or theatre. In addition, 12-18 quarter hours must be elected within two or more additional areas in the communications department other than the field selected for emphasis. The following are required courses based upon the emphasis chosen:

Journalism:
JRN 321, Copy editing (3)
JRN 330, History of Journalism (3)
COM 411, Legal Responsibilities of the Mass Media (3)
JRN 420, News Writing (3)
JRN 431, International Communications and the Foreign Press (3)
JRN 434, Principles of Advertising (3)

Radio-Television:
RTV 140, Radio-Television I (3)
RTV 240, Audio Production I (3)
RTV 241, TV Production I (3)

Speech:
SPE 261, English Phonetics and American Dialects (3)
SPE 262, Psychology of Communications (3)
SPE 360, Argumentation (3)
SPE 363, Discussion (3)

Theatre:
THA 180, Study of Theatre and Drama (3)

GENERAL PROGRAM:

In the student's over-all program in communications, 36 quarter hours must be elected and divided proportionally between two or three areas, whether communications, journalism, radio-television, speech or theatre. In addition, 12 quarter hours must be elected in any area in the communications department other than the areas selected. The following are recommended courses in each area:
Journalism:
- JRN 330, History of Journalism (3)
- COM 411, Legal Responsibilities of the Mass Media (3)
- JRN 420, News Writing (3)
- JRN 431, International Communications and the Foreign Press (3)

Radio—Television:
- RTV 342, Broadcast Journalism I (3)
- RTV 344, Broadcast Continuity/Programming I (3)
- RTV 346, Radio, Television, and Society (3)
- RTV 452, Broadcast Criticism (3)
- RTV 453, Educational Broadcasting (3)

Speech:
- SPE 261, English Phonetics and American Dialects (3)
- SPE 262, Psychology of Communication (3)
- SPE 360, Argumentation (3)
- SPE 363, Discussion (3)

Theatre:
- THA 180, Study of Theatre and Drama (3)
- THA 220, 221, 222, Basic Theatre Practice (1,1,1)
- THA 333, History of Theatre (3)
- THA 380, Directing I (3)

For course descriptions refer to specific areas: Communications, Journalism, Radio/Television, Speech and Theatre.

The table below illustrates the requirements for a major in Communications:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
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</tr>
<tr>
<td>Major Area Credits</td>
<td>48</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>183</td>
</tr>
</tbody>
</table>

MAJOR IN ECONOMICS

Students majoring in economics in the College of Humanities and Social Sciences must take ACCY 307, ECON 201, 202, and 203, ECON 321, ENG 301, and thirty-five hours from the behavioral sciences, mathematics, and the social sciences. The Bachelor of Arts program is designed to permit greater flexibility in course selection to the economics major not planning a career in business.
Although all of the economics courses are offered and administered by the College of Business Administration, they are available to students majoring in economics in either the College of Business Administration or the College of Humanities and Social Sciences.

Major course requirements for the Bachelor of Arts degree in Economics are:

1. **GENERAL ECONOMICS**

   **A. Required:**
   - ECON 301 Intermediate Price Theory (4)
   - ECON 311 Intermediate Money, Income and Employment Theory (4)

   **B. Elective:** (Six courses in economics not used elsewhere)

2. **QUANTITATIVE ECONOMICS**

   **A. Required:**
   - ECON 301 Intermediate Price Theory (4)
   - ECON 311 Intermediate Money, Income and Employment Theory (4)
   - ECON 371 Mathematical Economics (3)
   - ECON 421 Economic Statistical Analysis (5)
   - ECON 451 Econometrics (3)

   **B. Elective:** (Three courses in economics not used elsewhere)

**MAJOR IN ENGLISH**

The major in English with a concentration in literature consists of a minimum of 48 quarter hours, including the following required courses: ENG 210, 211, 212, 213; 311, 312; 313, or 314; 471; plus 9 hours of either 421, 422, 423; 424, 425, 426; 427, 428, 429; or 451, 452, 453; 6 quarter hours from the following courses: 430, 431, 432, 433, or 434; and 9 hours to be selected in consultation with the student’s adviser.

The major in English with a concentration in writing consists of a minimum of 48 quarter hours, including the following: 18 hours selected from ENG 210, 211, 212, 213, 311, 312, 313, 314; ENG 471 and 472; 6 hours selected from 400-level literature courses; ENG 302; 9 hours selected from ENG 303, 304, 401, 402, 403, 404; and 6 hours selected in consultation with the student’s adviser from writing courses in English or Communications. All majors in writing must demonstrate acceptable skill in typing by the end of the sophomore year.
Students interested in secondary school teaching may prefer to elect the combined English-Education major. They are advised to achieve the broadest possible base in literature through taking the full range of survey courses in English and American literature, together with extensive training in writing and in the structure of the language.

Library science majors should also undertake to achieve a broad base through survey courses and those specialized English courses that will contribute to their development as librarians.

Students majoring in English must show proficiency in one modern foreign language by taking two years of one language in the Department of Foreign Languages, by passing a proficiency examination offered by that department, or by presenting four years of high school credit in one language.

The table below illustrates the requirements for a major in English:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
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</tr>
<tr>
<td>Basic (55)</td>
<td>69</td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td></td>
</tr>
<tr>
<td>English (48)</td>
<td>66</td>
</tr>
<tr>
<td>Modern Language (18)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>183</td>
</tr>
</tbody>
</table>

**MAJOR IN FOREIGN LANGUAGE**

Language studies in the College of Humanities and Social Sciences provide instruction in French, German, Russian, and Spanish, with majors in French and Spanish. These programs are designed to meet the needs of students who desire competency in a language and expanded understanding of foreign culture and literature. Students enrolled in 100 and 200-level language courses are required to attend the language laboratory for at least one hour per week.

**Major Requirements:**

A student wishing to major in a foreign language must meet all the requirements for graduation as set forth by the University, the College of
Humanities and Social Sciences, and the Department of Foreign Languages. The foreign language major must complete forty-five quarter hours in the chosen language beyond the 100 and 200 level. Among these forty-five hours the student must take courses numbered 301, 303, 311, 312, 313, and 401. (Course letter prefix is determined by the language.)

Combined Majors:

For a major in two foreign languages, a student must take the courses numbered 301, 303, 311, 312, 313, and 401 in both languages plus an additional nineteen credits in his first language and an additional ten credits in his second language.

A native speaker must substitute a literature course for the advanced conversation course (303). Moreover, in cases where the native speaker has received advanced education abroad, he will not be permitted to take the advanced composition course (301) for the fulfillment of his major requirements but must substitute another language course chosen with his adviser.

Placement of Students in Language Classes:

Normal placement is as follows: Four years of one high school language would place the student in the first quarter of the third year; three years, in the second quarter of the second year; two years, in the first quarter of the second year; one year, in the second quarter of the first year.

If a student feels that his high school preparation was inadequate, he may be allowed to drop back one quarter with the permission of a member of the Foreign Language Department. If a student has studied a language in high school for two years or less, five or more years prior to the time of enrollment in a language course, he may be allowed to disregard his high school language training and begin anew.

The table below illustrates the requirements for a major in foreign languages:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Single Major</td>
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</tr>
<tr>
<td>Environmental Studies</td>
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<tr>
<td>Basic (55)</td>
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</tr>
<tr>
<td>Advanced (14)</td>
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</tr>
<tr>
<td>Major Area Credits</td>
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</tr>
<tr>
<td>Electives</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>
B. Combined Majors

Environmental Studies 69
Basic (55)
Advanced (14)

Major Area Credits 67
First Language (38)
Second Language (29)

Electives 47
TOTAL 183

Whether the student chooses to major in one or two foreign languages, or plans a foreign language-education major, he and his adviser should organize his elective courses in the areas of literature, (foreign or otherwise) and related disciplines (such as art, history, humanities, music, philosophy).

MAJOR IN HISTORY

Students majoring in history must complete 45 quarter hours in history courses. The required courses are:

HIST 201, 202, 203 Western Culture and Civilization (3,3,3)
HIST 311, 312, 313 American History (3,3,3)

An additional nine quarter hours credit in junior or senior level courses in American or Latin American history; nine quarter hours credit in junior or senior level courses in European history, plus nine additional hours in junior or senior level courses.

History majors are expected to have a reading knowledge of a foreign language. This requirement may be met by demonstrating proficiency in an examination administered by the Foreign Language Department or by completing the appropriate courses.

The table below illustrates the requirements for a major in History:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>45</td>
</tr>
<tr>
<td>History (45)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>
THE HUMANITIES REQUIREMENT IN ENVIRONMENTAL STUDIES

As part of the “Basic Program” of Environmental Studies, students are required to take nine quarter hours in Western Humanities, HUM 301, 302 and 303. The courses must be taken in sequence since they treat a history of recurring ideas.

Prerequisites

Sophomore standing is a prerequisite for all courses offered in the Department of Humanities, and HUM 301, 302, and 303 (or equivalent) are prerequisites for all 400-499 courses in humanities.

MAJOR IN HUMANITIES

The major requires at least 48 quarter hours in HUManities courses and a balanced choice of electives in such areas as philosophy, religion, music, art, history, and literature. It is strongly recommended that at least two courses in music history and two in art history be included. Two years of a foreign language (or equivalent proficiency) are required. The student should work out his program with a humanities adviser, but the following will serve as a guide:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM 301-303</td>
<td>9</td>
</tr>
<tr>
<td>HUM 311-351</td>
<td>6</td>
</tr>
<tr>
<td>HUM 355-399</td>
<td>6</td>
</tr>
<tr>
<td>HUM 401-449</td>
<td>6</td>
</tr>
<tr>
<td>HUM 451-489</td>
<td>9</td>
</tr>
<tr>
<td>Humanities Electives</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>48</td>
</tr>
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</table>

The table below illustrates the requirements for a major in Humanities:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>48</td>
</tr>
<tr>
<td>Humanities (48) 9 qtr. hrs. inc. in ES</td>
<td></td>
</tr>
<tr>
<td>Foreign Language (18) 9 qtr. hrs. inc. in ES</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>

JOURNALISM

(See Communications)
LIBRARY SCIENCE

The offerings in library science are designed to permit those students pursuing a program leading to certification in either elementary or secondary education to add library and audio-visual service to their certificates as an area of specialization. In addition, the offerings are designed to provide the undergraduate core of library science courses required by a number of graduate library schools. Students who plan to attend a graduate library school should contact representatives of the library school of their choice prior to taking undergraduate library science courses. The required courses for certification in library and audio-visual services are found with the College of Education program descriptions.

MAJOR IN MUSIC

The degree of Bachelor of Arts with a major in music is designed for the study of music in a liberal arts curriculum, with a concentration in applied instruments, voice, music theory, history and literature and in the professional area of performance. (Depending on the student’s background, it may be necessary to accumulate more or less than the required number of hours in music.) The minimum requirements for this degree are 183 quarter hours. The degree normally involves 96 hours in music from the following courses:

6 quarter hours of applied music during each of the four years
MUS 101, 102, 103 Music Theory (3,3,3)
MUS 201, 202, 203 Music Theory (3,3,3)
MUS 301, 302, 303 Counterpoint (3,3,3)
MUS 320, 321, 322 Orchestration (3,3,3)
MUS 350 Composition (2-5)
MUS 401, 402, 403 Form and Analysis (3,3,3)
MUS 104, 105, 106 Music Literature (2,2,2)
MUS 218, 219, 220 Piano Literature (2,2,2)
MUS 221, 222, 223 Song Literature (2,2,2)
MUS 340, 341, 342 Music History (3,3,3)
MUS 450, 451, 452 Music of the Twentieth Century (3,3,3)
MUS 307 Concert Choir (1)
MUS 308 Band (1)
MUS 309 Orchestra (1)
MUS 496 Special Topics (2-5)
MUS 497 Undergraduate Seminar (2-5)
MUS 498 Independent Study (2-5)
All students seeking this degree are expected to perform a faculty approved recital in their major applied area (instrument or voice). This recital is normally presented in the senior year.

Each student must pass a piano proficiency examination. This examination must be attempted by the end of the sophomore year. If the student is unable to pass the examination, he must then study piano each quarter until he has met this requirement.

Ensemble experience and recital attendance are required in each quarter of the music major curriculum.

A foreign language should be taken by all voice students and by students who plan to attend graduate school.

The table below illustrates the requirements for a major in Music:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>96</td>
</tr>
<tr>
<td>Music (60)</td>
<td></td>
</tr>
<tr>
<td>Applied Music and Ensemble (36)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>18</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>

PHILOSOPHY

Although there are a number of philosophy courses available to the student, at the present time no major is offered. See course listings for offerings.

MAJOR IN POLITICAL SCIENCE

The discipline of political science deals with the elements of man’s political behavior: politics, the study of the diverse institutions, procedures and practices relating to political decision-making; and government, the study of the processes by which political decisions are made operational. Political science is thus interdisciplinary in its interest and yet segmentally focused into major areas of concern.

The major in political science consists of a minimum of 54 quarter hours, including 39 quarter hours in the major and 15 quarter hours in related fields. The major must include the following:
PCL 201 American National Government (3)  
PCL 203 Principles of Political Science (3)

In addition, the student must include a minimum of 5 courses at the 400 level. The remaining 15 quarter hours may be taken in such related fields as anthropology, economics, geography, history, mathematics, philosophy, psychology, sociology, or statistics according to the interests of the student and with the agreement of his adviser.

Although there are no formal language requirements for a political science major, it is strongly recommended that majors planning to continue their education at the graduate level or pursue a career in international fields acquire a working knowledge of a foreign language.

Prerequisites for political science majors for all courses numbered 300 or above are PCL 201 and PCL 203. For non-majors there are no prerequisites except permission of the instructor.

The table below illustrates the requirements for a major in Political Science:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
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<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>39</td>
</tr>
<tr>
<td>Political Science (39)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>75</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>

**MAJOR FOR PRE-LAW STUDENTS**

Schools of Law admit graduates of accredited colleges, but most do not prescribe a standard program for the major in the undergraduate college. On the other hand, they suggest that applicants present a major in one of the following subject areas supported by electives from these same fields: accounting, economics, English, finance, history, literature, political science, sociology, and speech. Students who expect to enter a school of law should plan their program with the aid of the pre-law adviser.

**MAJOR IN PSYCHOLOGY**

The major in psychology consists of 44 quarter hours, including the following courses:
PSY 201, 202 General Psychology (3,3)
PSY 301 Basic Learning Processes (4)
PSY 303 Physiological Psychology (4)
PSY 309 Personality Theory (4)
PSY 311 Methods of Psychological Research (3)

The remaining 23 quarter hours of psychology may be taken according to the interests of the student and with the agreement of his adviser.

Required courses from allied areas:

COMP 101 Introduction to Computer Science (3) OR
COMP 102 Computer Programming (3)
MATH 221 Calculus with Analytical Geometry (4) OR
BIOL 360 Genetics (4)
STAT 201 Principles of Statistics (4)
STAT 401 Statistical Methods (4)

Students expecting to enter graduate school should seriously consider electing at least one year of a foreign language.

The table below illustrates the requirements for a major in Psychology:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
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</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>59</td>
</tr>
<tr>
<td>Psychology (44)</td>
<td></td>
</tr>
<tr>
<td>Allied Courses (15)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>55</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>

RADIO—TELEVISION

(See Communications)

RELIGION

Although religion courses are available, at the present time no major is offered. See course listings for offerings.
MAJOR IN SOCIOLOGY

The major in sociology consists of 48 quarter hours, including the following courses:

SOC 201, 202 General Sociology (3,3)
SOC 321 General Anthropology (3)
SOC 331 Social Problems (3)
SOC 306 Modern Sociological Thought (3)
SOC 499 Undergraduate Research (3,3)
Total - 23 Quarter Hours

The remaining quarter hours may be taken in other sociology courses, according to the interest of the student and with the agreement of his adviser.

Students enrolled in the social welfare concentration must take the following courses with specific welfare content as part of the required 48 hours.

SOC 340 Social Welfare: A Social Institution (5)
SOC 341 Social Work: Principles and Methods (3)
SOC 342 Government and Social Welfare (3)
SOC 343 The Community and Social Welfare (3)
SOC 412 Field Experience and Seminar (5)
SOC 498 Independent Study (3)

Students enrolled in the law enforcement concentration must take the following courses. The sociology courses listed below will be counted toward the 48 required quarter hours in sociology and the other courses will be taken as electives.

COM 301 Social, Ethical, and Legal Responsibilities of the Mass Media (3)
ENG 301 Professional Report Writing (3)
PSY 310 Abnormal Psychology (4)
SOC 331 Social Problems (3)
SOC 345 Juvenile Delinquency (5)
SOC 346 Criminology (5)
SOC 348 Sociology of Alcoholism (3)
SOC 350 Sociology and the Supreme Court: Focus for Social Change (3)
SOC 407 The Family (5)
SOC 496 Special Topics with emphasis on corrections (5)
SOC 498 Independent Study with emphasis on specified correctional projects (5)
SOC 352 Entergroup Conflict and Prejudice (3)
Total - 47 Quarter Hours

Students majoring in sociology need a proficiency in at least one modern foreign language and the cultural traditions of the people who speak it. A minimum of the first 9 quarter hours of one foreign language or its equivalent is required.

The table below illustrates the requirements for a major in Sociology:

<table>
<thead>
<tr>
<th>Areas</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
<tr>
<td>Advanced (14)</td>
<td></td>
</tr>
<tr>
<td>Major Area Credits</td>
<td>48</td>
</tr>
<tr>
<td>Sociology (48)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>66</td>
</tr>
<tr>
<td>TOTAL</td>
<td>183</td>
</tr>
</tbody>
</table>

SPEECH
(See Communications)

THEATRE
(See Communications)
It is the purpose of the College of Natural Sciences to assist all of its students to develop their individual capabilities to the fullest. The College is concerned not only with the intellectual development of its students, but also with their proper physical, emotional, social, and spiritual growth. To this end, the College will provide a broad liberal education through the Environmental Studies Program as well as concentrated study in specialized fields.

Specific objectives of the College of Natural Sciences are:

A. To see that the student obtains a broad liberal education which will:
   1. Develop in him a sense of personal and social responsibility;
   2. Aid him in developing those qualities of mind and character necessary to intellectual advancement and to productive membership in society;
   3. Give him an awareness of the more important achievements of mankind;
   4. Arouse his intellectual interests;
   5. Give him an increased appreciation of the values expressed in morality, religion, the sciences, and the fine arts;
   6. Bring about a progressive strengthening and refining of the powers of reasoning and judgment; and
   7. Stimulate him to continue to seek knowledge throughout his adult life.

B. To provide the student, through its programs of concentrated study, with the opportunity to achieve competence in a scientific or technical profession of his choosing.

C. To help develop the student's character and provide him with the motivation to use his knowledge wisely.

In order to achieve the above objectives, the College of Natural Sciences will:

A. Participate in the Environmental Studies Program to provide all students in the University with the opportunity to obtain some fundamental understanding in the sciences so that they may deal with the complexities of modern life;
B. Provide undergraduate and graduate instruction in the various subject matter fields which constitute the biological, mathematical, physical, and health related sciences;

C. Encourage and support research in all subject matter fields which are included in the College of Natural Sciences; and

D. Provide training in preparation for later admission to a professional school of dentistry, medicine, nursing, or veterinary medicine.

The College of Natural Sciences will cooperate with the College of Business Administration and the College of Humanities and Social Sciences by making available to their students general and specialized courses in the mathematical and natural sciences; with the College of Engineering by providing instruction in those basic fields that constitute the scientific framework upon which its professional programs are built; and with the College of Education in the preparation of elementary and secondary school teachers by providing extensive and intensive training in the biological, mathematical, and physical sciences.

Major Study Programs and General Requirements for the Bachelor of Science Degree

Each degree program in the College of Natural Sciences must contain:

1. at least 183 credits including the Environmental Studies Program, requirements of the major department, and electives;

2. at least 72 credits from courses numbered 300 or above;

3. at least one year of mathematics, one year of biological sciences, and one year of a physical science.

Students must maintain a cumulative grade point average of "C" or better in all courses attempted. All degree programs must be approved by the major department and by the Dean of the College of Natural Sciences.

At the present time, degree programs are available in the following areas:

Allied Health Sciences
   Inhalation Therapy
   Medical Records Science
   Medical Technology
Preprofessional programs are also available to prepare students for further study in schools of dentistry, medicine, nursing, and veterinary medicine.

Program Planning

Although suggested curricula are available in most areas, each student will plan his program in consultation with a faculty adviser appointed by the chairman of the major department or by the Dean of the College of Natural Sciences.

DEPARTMENT OF ALLIED HEALTH SCIENCES

The Department of Allied Health Sciences offers a major in the allied health sciences with options in inhalation therapy, medical records science, and medical technology.

Allied Health Sciences: Inhalation Therapy, Medical Records Science, and Medical Technology Options

Graduates in the allied health sciences are prepared for positions in medical and hospital laboratories, clinics, Public Health Service Laboratories, and in various local, state, and federal organizations.

The demand for personnel trained in the allied health sciences and the ancillary medical services is rapidly increasing with the development of more sophisticated and extensive medical care. The number of hospitals, clinical laboratories, etc., employing modern techniques and the latest advances in medicine and related areas is now greater than ever, thus the critical need for students trained in the allied health professions. The program in the allied health sciences allows for the selection of an option in inhalation therapy, the study of the use of gases as therapeutic agents;
or medical records science, the study of the preparation and keeping of all forms of medical records; or medical technology, the study of the operation and management of the medical laboratory.

The prospective student is cautioned that admission to the allied health sciences curriculum at the first or second year level (or third year level in the case of students in medical technology who elect the three year program) does not constitute admission to the clinical year(s). Admission to the clinical year(s) is dependent upon the student’s performance prior to this stage in his education and the availability of openings in the clinical facility. Separate application must be made for admission to the clinical portions of the program at least six months, but not more than one year, prior to the time the student expects to be admitted.

Required courses in this program are identified by course number in the curriculum shown on the following pages.

### ALLIED HEALTH SCIENCES CURRICULUM

#### First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allied Health Sciences Orientation (AHS 100)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Sciences (BIOL 100; ZOOL 100)</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>(BIOL 101; ZOOL 101)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chemistry (CHEM 111, 112, 113)</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(CHEM 114, 115)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Communications (ENG 101; SPE 101; COMP 101)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics*</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Social Environment</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>16</td>
<td>18</td>
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</table>

#### Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences (ZOOL 234; MICR 200)</td>
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<td>3</td>
<td>1</td>
</tr>
<tr>
<td>(MICR 201)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanities (HUM 301, 302, 303)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Physics** (PHYS 107, 108, 281)</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>(PHYS 189)</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Social Environment</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Statistics (STAT 201)</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Engineering</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Electives (Environmental Studies)</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

*To be selected in consultation with the student's adviser.

**Students planning to elect the option in Medical Records Science should substitute ECON 201, 202, 203 for Physics.

The curricula for the third and fourth years in the three options, inhalation therapy, medical records science, and medical technology, will be published as a supplement to this Bulletin. The third and fourth years include both clinical and academic course work in all options. (NOTE: In medical technology an alternative procedure is available. Students desiring
to take their clinical training entirely during the fourth year, may, following completion of an approved three year academic program, obtain a Bachelor of Science degree after the satisfactory conclusion of one year of study (not less than 42 quarter credit hours) with a grade point average of "C" or better at a hospital having a medical technology program approved by Florida Technological University, the American Society of Clinical Pathologists, and the Council on Medical Education and Hospitals of the American Medical Association. Upon completion of the hospital program, the student shall request the hospital school director to forward a transcript of credits and a recommendation that the degree be conferred to the Dean of the College of Natural Sciences at Florida Technological University. Prospective students should contact the department for additional information on this alternative procedure.)

Other Programs in Allied Health Sciences

There are in excess of 60 recognized areas of specialization in the allied health professions. Students interested in any of these areas, other than the options we now offer, may complete the first two years of our program as the pre-clinical portion of their education. Those students desiring to pursue their pre-clinical training at Florida Technological University should consult with their adviser prior to beginning the program.

DEPARTMENT OF BIOLOGICAL SCIENCES

The Department of Biological Sciences offers a major in biological science with options in biology, botany, microbiology, and zoology; as well as pre-professional programs.

Biological Science: Biology, Botany, Microbiology, and Zoology Options

In an age when new discoveries are reported daily on both celestial and molecular levels, the study of living organisms has gained new importance among the sciences. Students in the life sciences find themselves increasingly in demand in teaching and many phases of research and, as a result, are well grounded in the chemistry, physics, and mathematics required of most advanced degrees. The program in biological science allows for the selection of an option in biology for those students seeking a broad and varied background; or botany, the study of plants; or microbiology, the study of bacteria, yeasts, molds, and algae; or zoology, the study of animals. Through the judicious selection of electives in consultation with a faculty adviser, a specialty field, such as physiology, may be emphasized in any one of the options outlined above.
Required courses in this program are identified by course number in the curriculum shown on the following pages.

**BIOLOGICAL SCIENCE CURRICULUM**

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Courses</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong>¹</td>
<td>Biological Sciences (Biol 100; Zool 100; Bot 100) (Biol 101, Zool 101, Bot 101)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry (Chem 121, 122, 123) (Chem 124, 125)</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communications (Eng 101, Spe 101, Comp 101 or Comp 102)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematics*</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>16</td>
<td>17</td>
<td>17</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
<th>Courses</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second Year</strong>¹</td>
<td>Biological Sciences (Micr 200, Biol 360) (Micr 201)</td>
<td>3</td>
<td>4</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Chemistry (Chem 161, 162, 163)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foreign Language**</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humanities (Hum 301, 302, 303)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
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**BIOLOGY OPTION**

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**BOTANY OPTION**

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**MICROBIOLOGY OPTION**

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<td>(Option B — Group I)</td>
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**ZOOLOGY OPTION**

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<td>(CHEM 113)</td>
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<td>(Option B — Group II)</td>
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<td>Engineering</td>
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<table>
<thead>
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Minimum credits required for graduation, 190.

1. Required of all students majoring in any Biological Science curriculum.

*To be selected in consultation with the student’s adviser.

**Proficiency in Russian, German, French, Spanish or another foreign language approved by the student’s adviser can be demonstrated by examination or by
successful completion of 9 credits of the language. Students expecting to enter graduate school should seriously consider electing an additional 3 quarters of the language.

***Students planning on graduate study in molecular areas of biology should take additional courses in statistics and biochemistry.

Premedical, Predental, and Preveterinary Program

Although many professional schools accept students who have satisfactorily completed three years of college, a large number of medical schools also require completion of the baccalaureate degree. This curriculum through the junior year satisfies the requirements for admission to all dental schools and to most medical schools as listed in the current editions of Medical School Admission Requirements in the U.S.A. and Canada published by the Association of American Medical Colleges and Admission Requirements of American Dental Schools published by the American Association of Dental Schools. In addition, it provides the prerequisites for electing major work in Biology and/or Chemistry during the senior year, thereby meeting admission requirements of those professional schools requiring the bachelor’s degree. Students who complete the junior year at Florida Technological University may obtain a Bachelor of Science degree after successfully completing the first year of study (not less than 41 quarter credit hours) with a grade point average of “C” or better at an approved professional school. Following completion of the first year of professional study, the student shall request the dean of the professional school to forward a transcript of credits and a recommendation that the degree be conferred to the Dean of the College of Natural Sciences at Florida Technological University.

Required courses in this program are identified by course number in the curriculum shown below.

PREMEDICAL, PREDENTAL, AND PREVETERINARY CURRICULUM

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<th>First Year</th>
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<td>(CHEM 124, 125)</td>
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<td>Chemistry (CHEM 261, 262, 263)</td>
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<td>Physics (PHYS 211, 212, 213)</td>
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General Electives (Environmental Studies) 3
Social Environment (Option B — Group I or II) (Option B — Group I) 3

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<td>Chemistry (CHEM 361, 362)</td>
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<td>Electives</td>
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** Third Year **

Total Credits: 17 16 16

Fourth Year

- Students who remain in residence for a fourth year to obtain a B.S. degree must complete the requirements of the degree program of their choice.

* Students deficient in algebra and trigonometry must make up this deficiency before enrolling in MATH 221.

** Proficiency in Russian, German, French, Spanish or another foreign language approved by the student's adviser can be demonstrated by examination or by successful completion of 9 credits of the language. Students planning to enter a professional school requiring two years of a language should take an additional 3 quarters of the language.

Other Preprofessional Programs

Training is available to students in numerous other preprofessional areas such as pharmacy, nursing, etc. Requirements of professional schools offering degrees and/or clinical training in these fields, although similar, vary a great deal. Students desiring to take preprofessional work in any of these areas should consult with their adviser prior to beginning their programs.

DEPARTMENT OF CHEMISTRY

The chemistry curriculum provides the student with an opportunity to develop his ability to think creatively in a dynamic field of human endeavor. Because chemists contribute to a broad spectrum of man's efforts to understand and control his physical environment, the student of chemistry has considerable latitude in his choice of career. He may elect to probe into the nature of the bonding forces that hold molecules together or to seek answers to biological phenomena. A chemist's colleagues might be physicists, physiologists, or psychologists. Some of the appeal, therefore, of chemistry is its position as a bridge to other fields of knowledge. As a result, the curriculum has been made sufficiently flexible to permit the student to prepare himself for one or more of the many career possibilities that arise from the unique position that chemistry occupies in the sciences.
A student will, upon graduation, find opportunities for employment in industry, government service, and education. Positions may entail basic research or applied research, product development or control, sales, management, or teaching.

A chemistry graduate, should he choose to do so, will be in a position to continue his training at the graduate level and to qualify for a more demanding position in the profession.

Required courses leading to the Bachelor of Science degree in chemistry are identified by course number in the following curriculum.

**CHEMISTRY CURRICULUM**

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</table>

Minimum credits required for graduation, 192.

*Students may defer taking the 8 hours of electives in the biological sciences until a later year. If they do so, it is recommended that some of the Social Environment requirements be taken in the first year.
**Use of Social Environment--Option B and an additional 9 quarter hours of electives will allow for 18 quarter hours of German which is strongly recommended for those intending to pursue graduate studies.

***Of the 27 quarter hours of electives shown in the junior and senior years, 9 must be taken in chemistry.

DEPARTMENT OF MATHEMATICAL SCIENCES

The current explosion in scientific knowledge is to a large extent dependent upon the interplay between the mathematical sciences and the experimental sciences. In many cases new developments in the mathematical sciences lead directly to new scientific information. Mathematics has long been used as a tool and to provide models for the engineer and physical scientist. In recent years, statistics and computer science have assumed an important role in these areas. At the present time all three, mathematics, statistics, and computer science, have also become indispensable in business, education and the biological, behavioral, and social sciences.

Courses in the mathematical sciences at Florida Technological University are designed to serve four kinds of students: (1) those who want to become professional mathematicians, statisticians, or computer scientists; (2) those who intend to teach mathematical sciences in secondary schools, colleges, and universities; (3) those who need to use mathematics, statistics and computer science as tools in other areas; and (4) those who desire to increase their understanding of these important disciplines.

Students graduating in the mathematical sciences will find many opportunities for employment in industry, government and education. The present and anticipated demand for such capability is very great. Graduates will also be prepared to continue their studies at the graduate level.

Required courses leading to a Bachelor of Science degree in mathematics, statistics, or computer science are identified by course number in the curricula which appear in the following pages.

Computer Science Curriculum

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<td>Electives</td>
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14 15 15
### Second Year

- Chemistry or Physics (CHEM 111, 112, 113 or PHYS 211, 212, 213) (CHEM 114, 115 or PHYS 282, 283)  
  - Computer Science (COMP 201, 202)  
  - Social Environment  
  - Mathematics (MATH 321)  
  - Mathematical Sciences Electives  
  - General Electives (Environmental Studies)  
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### Third Year

- Business (BADM 301)  
- Computer Science (COMP 301, 302, 303) (COMP 461, 462, 463)  
- Humanities (HUM 301, 302, 303)  
- Senior Seminars  
- Social Environment  
- Statistics (STAT 341, 342, 343)  
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### Fourth Year

- Computer Science (COMP 401, 411, 421)  
- Senior Seminars  
- Social Environment  
- Engineering  
- Mathematical Sciences Electives  
- Electives  
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Minimum credits required for graduation, 183.

### Mathematics Curriculum

#### First Year

- Biological Sciences (Biol 100; Zool 100; Biol 360) (Biol 101; Zool 101)  
- Communications (Eng 101; Spe 101; Comp 102)  
- Mathematics (Math 221, 222, 223) (Math 198)  
- Social Environment  
- Electives  
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#### Second Year

- Chemistry or Physics (CHEM 111, 112, 113 or PHYS 211, 212, 213) (CHEM 114, 115 or PHYS 282, 283)  
- Computer Science (COMP 201, 202)  
- Social Environment  
- Mathematics (MATH 221)  
- Mathematical Sciences Electives*  
- General Electives (Environmental Studies)  
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#### Third Year

- Business (BADM 301)  
- Humanities (HUM 301, 302, 303)  
- Mathematics (MATH 411, 412, 413) (MATH 421, 422, 423)  
- Senior Seminars  
- Social Environment  
- Statistics (STAT 341, 342, 343)  
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#### Fourth Year

- Senior Seminars  
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Engineering
Mathematical Sciences Electives*
Electives

*The Mathematical Sciences Electives must include at least six hours from each of the following areas:

(1) Linear Algebra (MATH 318, 319);
(2) Topology and Geometry (MATH 461, 462, 351, 352);

Minimum credits required for graduation, 183.

Statistics Curriculum

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Minimum credits required for graduation, 183.
CONTINUING EDUCATION

Responsive to the continuing education needs of its "community", Florida Technological University serves Brevard, Volusia, Lake, Seminole, Osceola and Orange Counties by offering two distinct types of courses and programs, credit and non-credit. Off-campus Continuing Education Centers are located in Cocoa and Daytona Beach, with full-time resident professors and staffs in each.

Off—Campus Credit Courses

These courses are offered for individuals who are not within reasonable commuting distance of the University. Most of the students taking credit courses are employed full time with business, industry, government and the teaching profession. Off-campus credit courses are generally taught by the University's regular faculty. In certain instances, highly qualified persons from other educational institutions, as well as from business and industry, provide the instruction. Courses and/or programs are offered by outside requests primarily, although some are scheduled as needs are identified.

Non—Credit Programs

The University is offering a limited number of conferences, institutes, seminars, and workshops. These programs, which can be scheduled both on and off the main campus, are developed to meet the educational needs of business, professional, government, service, civic and other groups. Lecturers and discussion leaders come from the faculties of FTU and other educational institutions in addition to highly qualified individuals in various professional areas.

Further Information

Further information about Florida Technological University's Continuing Education programs may be obtained from the Dean of Continuing Education, Florida Technological University, Post Office Box 25000, Orlando, Florida 32816.
COOPERATIVE EDUCATION PROGRAM

Florida Technological University operates a Cooperative Education Program for those students who wish to combine their campus education with actual work experience.

In many cases, students who participate in this program will be able to observe direct relationships between their program of study and their employment. As a result of their work experience, the classroom activities of the students will tend to become more meaningful. The employment will also provide a source of income which may help the student defray his college expenses.

The Cooperative Education Program will be based on a format under which the student alternates between quarters of study on campus and quarters of employment, usually off campus. The student generally will be assigned to a work team and placed in employment related to his academic field of study.
COURSE DESCRIPTIONS

ACCOUNTANCY

ACCY 101 Basic Concepts (3)

ACCY 102 Basic Concepts (3)

ACCY 103 Basic Concepts (3)
PR: ACCY 102. Reading of financial statements, principles of valuation. The concept of cost. The budget concept.

ACCY 307 Accounting Concepts (5)
PR: Junior standing. An accelerated course in accounting concepts for the student desiring an understanding of accounting theory and practice. Credit may not be earned in both ACCY 307 and the ACCY 101, 102, 103 sequence.

ACCY 308 Accounting for Engineers (5)
PR: Junior standing. Industrial accounting, estimated costs, budget procedures and records useful to the engineer. Use of accounting and cost control as tools. Enrollment restricted to engineering students.

ACCY 311 Intermediate Accounting (3)
PR: ACCY 103 or 307. Accounting theory and practice in relation to the management of business analysis and interpretation of financial statements and other accounting and financial data. Purpose of internal control of methods for its achievement.

ACCY 312 Intermediate Accounting (3)

ACCY 313 Advanced Accounting (3)
PR: ACCY 312 or consent of instructor. Complex cases in partnership formation, expansion and liquidation; installment and special sales arrangements; mathematics of compound interest and annuities.
ACCY 314 Advanced Accounting (3)
PR: ACCY 313 or consent of instructor. Cases of enterprises in distress, estates, trusts, and branches; basic principles and methods for parent and subsidiary relationships.

ACCY 321 Cost Accounting (3)
PR: ACCY 103 or 307. The elements of cost recording. The basic cost concept. The importance of cost determination and recording.

ACCY 322 Cost Accounting (3)

ACCY 331 Auditing (3)
PR: ACCY 313. The audit concept. Understanding evidence as applied to the audit. Fundamental techniques, practices and procedures.

ACCY 341 Government Accounting (3)

ACCY 351 Federal Income Tax Accounting (3)
PR: ACCY 313. History, theory and basic concept of federal income taxation principles.

ACCY 352 Federal Income Tax Accounting (3)

ACCY 434 Audit Report Writing (3)
PR: ACCY 331. Preparation of audit reports. Legal and professional responsibilities of the auditor. Specialized reports and analyses. Professional ethics.

ACCY 461 Computer Applications to Accounting Problems (3)
PR: ACCY 313. The purpose of the computer in financial management. Its use as part of the accounting process. Place of the computer in present day accounting, budgeting and auditing matters.

ACCY 491 Problem Analysis (3)
ACCY 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ALLIED HEALTH SCIENCES

AHS 100 Allied Health Sciences Orientation (1)
A survey of the allied health sciences; opportunities and scope of the field.

ART

ART 201,202,203 Design (3,3,3)
Design fundamentals. Materials, processes, form. Application to product design, communication design, interior design, environmental design, and the fine arts. Stresses the value of planning and design in the development of a more humane civilization. Guest lecturers may be invited.

ART 204,205,206 Drawing (3,3,3)
Drawing as a means of formal organization. Introduction to problems in drawing techniques and media.

ART 207 20th Century Art (3)

ART 208 Ancient and Medieval Art (3)

ART 209 Renaissance, Baroque, and 19th Century Art (3)

ART 210 Oriental Art (3)

ART 301 Art History Seminar (2-5)
PR: Permission of instructor. Special topics in art history. Course of study and credits must be assigned prior to registration.

ART 302,303 Design Seminar (3,3)
Recent developments in the visual field.

ART 304 Photography (3)
PR: Six quarter hours in design fundamentals or consent of instructor.

ART 305 Painting (3)
PR: Six quarter hours in design fundamentals and six quarter hours in drawing fundamentals or consent of instructor.
ART

ART 306 Sculpture (3)
PR: Six quarter hours in design fundamentals and six quarter hours in drawing fundamentals or consent of instructor.

ART 307 Design II (3)
PR: Nine quarter hours in design fundamentals or consent of instructor.

ART 401 Studio Art (2-5)
PR: Consent of instructor. Directed independent study in either photography, sculpture, painting, or design. Course of study and credits must be assigned prior to registration. (May be repeated for credit.)

ART 403 Jewelry Creation (2-5)
PR: Consent of instructor. Course of study and credits must be assigned prior to registration.

ART 495 Senior Studio and Exhibition (3)
PR: Senior standing and consent of the studio areas faculty.

ART 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

ART 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOLOGY

BIOL 100 General Biology I (3)
Basic principles emphasizing the unifying concepts of biology and their relationships to diversity in living organisms. This course is a prerequisite to all other courses in the biological sciences.

BIOL 101 General Biology I Laboratory (1)
Laboratory exercises illustrating basic principles in biology; taken concurrently with BIOL 100.

BIOL 105 General Biology II (3)
PR: BIOL 100. An integrated approach to the Botanical and Zoological Sciences; the effect of society on the environment and its biological implications; suitable, with BIOL 100, for meeting Environmental Studies Program requirements.
BIOL 106 General Biology II Laboratory (1)
Laboratory exercises illustrating basic principles significant in today's environment; taken concurrently with BIOL 105.

BIOL 330 Immunology and Serology (3)
PR: 11 hours in biological sciences. Infection and the immune reaction; properties of antigens, production of antibodies; agglutination and precipitin reactions; quantitative techniques and isohemoagglutination.

BIOL 350 Principles of Ecology (3)
PR: 12 hours in biological sciences. Basic ecological processes applicable to all areas of ecology.

BIOL 360 Genetics (4)
PR: BIOL 100. Basic principles of heredity as applied to plants and animals. Laboratory will emphasize work with Drosophila.

BIOL 420 Cytology (4)
PR: 11 hours in biological sciences and CHEM 123. Structure of vegetative and reproductive cells; cytoplasmic differentiation; mitosis, meiosis, chromosomal aberrations.

BIOL 430 Cell Physiology (3)
PR: 11 hours in biological sciences and CHEM 123. Basic physiological processes, cellular organization, exchange of materials, conversion of energy, irritability and contractibility.

BIOL 460 Principles of Adaptation (3)
PR: 11 hours in biological sciences. An outline of evolutionary principles, natural selection, and phylogeny; origin of variation and origin of species.

BIOL 470 History of Biology (2)
PR: Junior standing. People and events from Aristotelian times to the present; development of science of biology.

BIOL 491 Contemporary Biology (3)
PR: Consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as BSCS biology and other modern approaches to secondary school biology. For prospective teachers of biology. (Same as EDSE 491).

BIOL 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.
BIOL 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOL 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOL 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

BOTANY

BOT 100 General Botany (3)
PR: BIOL 100. Introduction to botany; structure, function, representative groups of the plant kingdom.

BOT 101 General Botany Laboratory (1)
Laboratory exercises illustrating basic principles in botany; taken concurrently with BOT 100.

BOT 270 Economic Botany (3)
A lecture course to develop a broad understanding of the various plant groups and the economic importance of their members to man.

BOT 320 Plant Anatomy (4)
PR: BOT 100. Development and structure of the root, stem, and leaf of vascular plants.

BOT 330 Plant Physiology (5)
PR: BOT 100 and junior standing. Chemical and physical activities of plants; absorption, transpiration, mineral nutrition, photosynthesis, and growth.

BOT 340 Phycology (4)
PR: BOT 100. A lecture-laboratory course to survey the diversity and classification of marine, terrestrial and freshwater algae.

BOT 341 Mycology (4)
PR: BOT 100. A lecture-laboratory course to cover the major groups of fungi, treating their morphology and classification and emphasizing those of especial importance to man.

BOT 342 Bryology (4)
PR: BOT 100. A lecture-laboratory survey course on the diversity and
classification of mosses, liverworts and hornworts with special emphasis on those found in Florida.

**BOT 345 Plant Taxonomy (4)**
PR: BOT 100. Morphology and systematics of angiosperms; an introduction to flowering plant taxonomy.

**BOT 350 Plant Ecology (4)**
PR: BOT 345 or consent of instructor. Effects of environmental factors on various plant groups; succession and stabilization of plant communities.

**BOT 430 Advanced Plant Physiology (4)**
PR: BOT 330 and CHEM 352 or consent of instructor. Special problems in contemporary plant physiology; instrumentation methods.

**BOT 445 Advanced Plant Taxonomy (4)**
PR: BOT 345. Application of advanced biosystematic techniques and concepts to plant taxonomy; selected problems.

**BOT 450 Advanced Plant Ecology (4)**
PR: BOT 350. The application of ecological methods to local problems, emphasizing instrumental techniques and evaluation of data.

**BOT 453 Plant Geography (3)**
PR: BOT 345 and BOT 350. The major climax formations of the world and their representative plant taxa; the distribution of plants in time.

**BOT 470 Plant Pathology (4)**
PR: BOT 341 and MICR 200. A survey of the microorganisms causing plant diseases, emphasizing fungi, especially those forms which are important in Florida.

**BOT 472 Botanical History and Nomenclature (3)**
PR: BOT 345. The historical background of contemporary botany beginning in pre-Linnaean times and continued to the present, including the development of the International Code of Botanical Nomenclature and its application to special problems.

**BOT 496 Special Topics (2-5)**
PR: Consent of instructor. May be repeated for credit.

**BOT 497 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

**BOT 498 Independent Study (2-5)**
PR: Consent of instructor. May be repeated for credit.
BOT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

BUSINESS ADMINISTRATION

BADM 101 Business (4)
Survey of managerial divisions of finance, production, personnel, and marketing in business. Business terminology and overall structure of business in its environment. Historical and economic prospectives are considered. This course open only to students at freshman or sophomore level.

BADM 301 Business Concepts (3)
PR: Junior standing. The role of business and the environment in which it operates are considered. The responses business makes to freedom, ownership, the market economy and government are discussed. This course satisfies the Advanced Environmental Studies requirement for business.

BADM 311,312 Mathematical Applications to Business (3,3)
PR: MATH 115 or 121. A study of a wide range of quantitative decision procedures as applied to problems in business administration.

BADM 371 Business Law (3)
PR: Junior standing. Introduction to the law and the use of the case method. The law of business contracts.

BADM 372 Business Law (3)
PR: BADM 371. The uniform commercial code. Law of sales, law relating to negotiable instruments, the law of banks and banking.

BADM 373 Business Law (3)
PR: BADM 372. Law of agency, partnerships, and corporations.

BADM 444 International Business Operation (3)
PR: Senior standing or consent of instructor. An integration of economics and the functional areas of business focused upon the problems of managing international business operations. Economic, legal, functional and administrative problems are studied through cases and literature emphasizing financial and marketing problems.

BADM 474 Business Law, Interests in Property (3)
PR: BADM 373 or consent of instructor. Secured transactions, principles
of property, personal and real, the law of bankruptcy, the law of suretyship.

BADM 484 Operations Research (3)
PR: ECON 321. Methods and models of operations research applied to specific business problems. Develops use of mathematical techniques and demonstrates its use in modern decision theory.

BADM 490 Senior Seminar: Business in Human Affairs (2)
Business issues and problems as they relate to human affairs. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to the student majoring in the College of Business Administration.

BADM 495 Business Policies (5)
PR: Senior standing and completion of all other business core course requirements, or consent of instructor. A study of problems confronting businessmen. The student will be expected to utilize the subject matter contained in the business core courses and his major in the analysis of business problems.

BADM 695 Business Research Methods (3)
PR: Graduate standing. Identification of areas for research, methods of business and economic research, and presentation and evaluation of the results.

CHEMISTRY

CHEM 100 Freshman Orientation (1)
A discussion session to acquaint students in the curriculum with the art, history, and current practice of chemistry.

CHEM 111,112,113 General Chemistry (4,3,3)
A course designed to develop a reasonable appreciation of chemistry by the non-major. Fundamental theories, inorganic, organic, natural products, biochemistry, and industrial processes will be discussed with emphasis on word concepts. This course, although not adequate preparation for most advanced lecture courses, will provide the necessary background for students wishing to participate in many of the laboratory courses.

CHEM 114,115 General Chemistry Laboratory (1,1)
PR: CHEM 111 or CHEM 161. A course to acquaint the non-major with some of the chemical arts as practiced in the inorganic, organic, and biochemical fields.
CHEM 121,122,123 Organic Chemistry (4,3,3)
Following an introduction of atomic structure, chemical periodicity, and stoichiometry, a study of spectroscopy and bonding in organic molecules is used to provide a bridge from the usual high school chemistry course to the study of organic chemistry. Fundamentals of organic chemistry including nomenclature, structure, reactions, and reaction mechanisms are covered.

CHEM 124 Organic Laboratory Techniques (2)
PR: CHEM 121. An introduction to the laboratory techniques of organic chemistry including the preparation, reaction, and analysis of organic compounds.

CHEM 125 Organic Laboratory Techniques (2)
PR: CHEM 122 and CHEM 124. A lecture-laboratory course for the development of laboratory skills through class-developed experiments. An open-ended approach is used.

CHEM 161,162,163 Chemical Principles (3,3,3)
An introductory study emphasizing the physical basis of chemistry and oriented toward the non-chemistry major. Stoichiometry, the periodic table, equilibrium, thermodynamics, kinetics, and atomic and molecular structure will be covered. Some descriptive inorganic chemistry will be included.

CHEM 261,262,263 Chemistry Fundamentals (3,3,3)
PR or CR: MATH 223. A course in the theory of chemical reactions. Atomic structure and chemical bonding theory, chemical periodicity, stoichiometry, equilibria, thermodynamics, and kinetics will be included.

CHEM 351,352 Analytical Laboratory Techniques (3,3)
PR: CHEM 163 or CHEM 263, and CHEM 123; or CHEM 113. A lecture-laboratory course designed to establish a working knowledge of analytical laboratory techniques. A wide variety of classical and instrumental methods will be examined for their potential use in solving problems requiring chemical analysis. Emphasis will be placed on selecting the correct analytical method, performing the analysis, and interpreting the data obtained.

CHEM 355 Chemical Instrumentation for the Medical Laboratory (3)
PR: CHEM 113 and CHEM 352; or consent of instructor. A lecture-laboratory course designed to develop a working knowledge of the analytical instrumental techniques in the modern medical laboratory.

CHEM 361,362 Chemistry Fundamentals (3,3)
PR: CHEM 263. Continuation of CHEM 261, 262, 263.
CHEM 364,365 Physical Chemistry Measurements (2,2)
PR: CHEM 262 or CHEM 367. A laboratory course stressing the development of laboratory skills for precise chemical measurements such as molecular weight, density, atomic and molecular absorption, and electrical and magnetic properties.

CHEM 367,368,369 Physical Chemistry (3,3,3)
PR: CHEM 163, PHYS 108 or PHYS 212, and MATH 222. A lecture course in physical chemistry for transfer students majoring in chemistry and interested non-majors. Atomic and molecular structure, thermodynamics, kinetics, and chemical bonding will be included. CHEM 367, 368 will cover basic concepts. CHEM 369 will be a more detailed study of selected topics.

CHEM 399 Introduction to Research (1)
PR: Consent of instructor. A discussion course required of all chemistry majors in order to introduce them to the science and art of research as practiced in chemistry. Topics will be presented by staff and visiting scientists relative to their personal research efforts.

CHEM 421,422 Advanced Organic Chemistry (3,3)
PR: CHEM 123, and CHEM 362 or CHEM 369. A consideration of organic reaction mechanisms in the light of bonding theories, thermodynamics, and kinetics.

CHEM 431 Inorganic Chemistry (3)
PR: CHEM 362 or CHEM 369. A discussion of descriptive inorganic chemistry based on various bonding theories, thermodynamics, and kinetics.

CHEM 441,442,443 Biochemistry (3,3,3)
PR: CHEM 123, and CHEM 362 or CHEM 369. A consideration of the general properties of proteins, carbohydrates, and nucleic acids. Enzymes and their effect on biochemical systems will be discussed. Intermediary metabolism will be a central theme throughout the course.

CHEM 444,445 Biochemical Methods (2,2)
PR: CHEM 113 or CHEM 441, and CHEM 352. A laboratory course stressing the application of the chemical arts to the separation, identification, and quantitation of materials of biological significance.

CHEM 451,452 Analytical Laboratory Techniques (3,3)
PR: CHEM 352, and CHEM 362 or CHEM 369. A lecture-laboratory
course designed to establish a thorough understanding of modern methods of chemical analysis. The purpose of this precise study will be to prepare the student to propose methods of analysis for any material he may encounter. Qualitative and quantitative organic analysis as well as specific instrumental techniques will be covered.

CHEM 461 Selected Topics in Physical Chemistry (3)
PR: MATH 321, and CHEM 362 or CHEM 369. A rigorous mathematical treatment of chemical thermodynamics, kinetics, and quantum mechanics.

CHEM 471 Introduction to Nuclear Chemistry (3)
PR: CHEM 362 or CHEM 369. Discussion of fundamental particles, nuclear reactions, radioactivity, radiation chemistry, and isotope chemistry.

CHEM 474 Radiochemical Techniques (2)
PR: CHEM 112 or CHEM 163 or CHEM 263, and CHEM 115 or CHEM 124. A lecture-laboratory course stressing radiochemical handling techniques, radiation safety, and the detection and measurement of nuclear radiation.

CHEM 491 Contemporary Chemistry (3)
PR: Consent of instructor. Concepts, experiments, problems, and advanced topics included in courses such as CHEM Study and other modern approaches to secondary school chemistry. For prospective teachers of chemistry. (Same as EDSE 492).

CHEM 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.
CEES 221 Surveying (3)
CR: MATH 221. Theory and field practice in engineering, geological and land surveys. Two lectures, three hours laboratory.

CEES 321 Engineering Geology (3)
PR: ENGR 152 or equivalent. Physical geology with special emphasis on structural geology, ground water, soil genesis, and relation of geology to problems in soil mechanics. Two lectures, three hours laboratory.

CEES 351 Structural Mechanics (4)

CEES 361 Transportation Engineering (3)
PR: ENGR 342. Elementary investigation of all forms of transport — highway, rail, water, air. Systems approach to planning, design, construction, operation, and administration of transportation networks.

CEES 371 Urban Planning (3)
PR: ENGR 342 and 371. History and principles of planning; contemporary urban problems; current urban planning techniques.

CEES 411 Environmental Engineering (3)
PR: ENGR 361. Man's environment, water resources, hydrologic cycle, chemistry of natural water, quality requirements and water treatment, water distribution systems.

CEES 412 Environmental Engineering (3)
PR: ENGR 361. Man's environment, the carbon cycle and biochemistry of wastes, principles of waste treatment, drainage systems.

CEES 414 Sanitary Systems Design (3)
PR: CEES 411 or 412 and CEES 481. Planning capacity, and design of water distribution and domestic and storm drainage systems.

CEES 415 Atmospheric Pollution (3)
PR: CEES 411. Atmospheric composition and dynamics; origins and chemistry of contamination and biological significance; engineering methods of measurement and control.
CEES 416 Epidemiology and Public Health Engineering (4)
PR: Approval of instructor. Selected topics in occurrence and transmission of diseases, mathematical theory of epidemics, sanitation, and public health engineering and administration.

CEES 417 Environmental Health (4)
PR: Approval of instructor. Selected topics in industrial hygiene, occupational and radiological health hazards, effects of pollution on the natural environment, pollution control concepts, and regulatory agencies.

CEES 431 Soil Mechanics (3)
PR: CEES 321 and ENGR 312. Index properties and engineering characteristics of soils. Compaction, shear, compressibility, and permeability. Two lectures, three hours laboratory.

CEES 433 Site Foundation Engineering (3)
PR: CEES 431. Geological investigations for engineering purposes, case histories, interpretation of geologic maps, major aspects of geologic structure, weathering, river mechanics, glacial deposits, eolian deposits in the site location for an engineering structure.

CEES 441 Computer Applications in Structural Analysis (3)

CEES 443 Continuum Mechanics (3)

CEES 451 Structural Design (3)
PR: CEES 351. Design of steel and reinforced concrete structural members. Two lectures, three hours laboratory.

CEES 461 Transportation Engineering (3)
PR: CEES 361. Advanced topics in transportation system analysis.

CEES 462. Traffic Engineering (3)
PR: CEES 361. Study of operator and vehicle characteristics, street capacity, signals, signs and markings, etc. All phases of traffic engineering as applied to urban areas.
CEES

CEES 471 Urban Planning (3)
PR: CEES 371. Municipal organization and administration, public health, public utilities, services, zoning, replanning, critical studies.

CEES 481,482 Water Resources Engineering (3,3)
PR: ENGR 332 and 361. Engineering systems for development, utilization and control of water resources. Physical hydrology, economic analysis, case studies.

CEES 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

COED 200,300,400 Cooperative Education (0). See page 238.

COMMUNICATIONS

COM 100 Basic Communications (3)
Survey of basic factors affecting human interaction through communication; theories and models of communication; contributions of behavioral sciences and related arts; mass media in society.

COM 103 Voice and Diction (3)
Basic principles of diction, voice, development, and interpretation; intensive practical application through classroom exercises and special projects designed to meet individual vocal needs and professional objectives.

COM 300 Communication Theory as Related to the Mass Media (3)
Comparative study of views and theories of communication through the printed and spoken media; theories of perception and communication; information and recall involving printed media, public platform and electronic media.

COM 310 History of the Motion Picture (3)
Development of the film industry, its social and economic impact.
COM 311 Business and Professional Communication (3)
Investigation of the basic principles of communications as applied to business with emphasis on the written and oral communicative acts.

COM 400 Opinion and the Mass Media (3)
The role of the mass media in influencing public opinion. Theory and nature of publicity and propaganda and other specialized usage of media to gain rapport with and reaction from selected groups.

COM 401 Communicative Process in Government (3)
Creation of public opinion on issues, candidates, governmental policies in the struggle for power; use of communication in democratic processes.

COM 410 Social Responsibilities of the Mass Media (3)
Relationships between the mass media and society; examination of social and ethical responsibilities of the media.

COM 411 Legal Responsibilities of the Mass Media (3)
Legal rights and restrictions, including Constitutional guarantees; libel, invasion of privacy, and contempt of court.

COM 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

COM 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

COM 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

COM 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

COMPUTER SCIENCE

COMP 101 Introduction to Computer Science (3)
History of computers; description of a typical computer; computer elements and symbology; number systems; basic arithmetic operations; computer control and data flow; peripheral components; memory devices; problem solving using a programming language; case study of a non-trivial application of computers; economic, political, sociological, and other implications of computers, computer science, and computer technology.
COMP 102 Computer Programming (3)
CR: MATH 221. Digital computer programming and its application to the numerical solution of elementary engineering and scientific problems.

COMP 201, 202, 203 Algorithms and Programming (3,3,3)
PR: COMP 101 or COMP 102. Problem definition and solutions; notion of an algorithm; algorithmic representations; an introduction to (1) machine-oriented languages, (2) scientific programming languages, and (3) business-oriented languages; definition and use of functions, subroutines, and procedures; applications. During the third quarter of this sequence, the student will be assigned a major problem for analysis and solution.

COMP 301, 302, 303 Data Structures (3,3,3)
PR: COMP 202. Basic concepts of data; linear lists, strings, arrays, and orthogonal lists; representation of trees and graphs; storage systems and structures, and storage allocation and collection; multilinked structures, symbol tables and searching techniques; ordering or sorting techniques; formal specification of data structures, data structures in programming languages and generalized data management systems; recursion; string and list processing languages; compiler design and implementation.

COMP 401 System Design (3)
PR: COMP 302. Processor characteristics; peripheral equipment characteristics; information representation; zero-, single-, and multi-address processing, memory utilization; batch processing; paging and overlay; addressing schemes; control functions; input and output characteristics; and an introduction to data communications.

COMP 411 Operating Systems (3)
PR: COMP 401. Task scheduling; file management; file security; multi-programming; communication between system components, system logs and accounting; and status reporting.

COMP 421 Compiler Structure (3)
PR: COMP 401. A review of the major problem-oriented languages; syntax analysis; bootstrapping techniques and meta-compilers; languages for compiler writing; storage allocation and mapping; dynamic allocation; scanners; symbol tables; code emitters; one-pass and multi-pass systems; code optimization.

COMP 461, 462, 463 Numerical Analysis (3,3,3)
PR: COMP 202, MATH 317 or MATH 318, and MATH 321; or consent of instructor. Numerical solution of algebraic and transcendental equations,
systems of equations, ordinary and partial differential equations, and integral equations; interpolation; finite differences; eigen-value problems; relaxation techniques; approximations and error analysis.

COMP 471,472,473 Mathematical Programming (3,3,3)
PR: COMP 202, MATH 317 or MATH 318, and MATH 321; or consent of instructor. Linear, nonlinear, and dynamic programming; linear inequalities; theory and application of methods for determining the maximum and minimum of functions of many variables subject to constraints; special techniques for solving integer programming problems; simplex method and variants; gradient methods; applications in business, science and engineering.

COMP 481,482,483 Computer Processing of Statistical Data (3,3,3)
PR: MATH 321, STAT 402, and COMP 101 or COMP 102; or consent of instructor. The use of high-speed electronic computers in statistical analysis; approximation methods; error analysis; Monte Carlo calculations; simulation; combinatorial problems; matrix calculations; least squares analysis; multiple regression; stepwise regression; non-linear estimation; characteristic value problems; principal component analysis; factor analysis; analysis of variance and covariance computations.

COMP 487,488,489 Computer Processing of Business Data (3,3,3)
PR: Junior standing and COMP 101 or COMP 102. The use of high-speed electronic computers for business data processing; applications in accounting, payroll, inventory control, and production control; file organization, development, and control; sequential and random processing methods; exception reporting; on-line and off-line systems and controls; management games; advanced data systems and processing techniques.

COMP 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.
ECONOMICS

ECON 201 Principles of Economics (3)
The nature and method of economics. National income measurement, determination, and stabilization, including an analysis of the money and banking system.

ECON 202 Principles of Economics (3)
The functioning of the market system in the determination of product prices.

ECON 203 Principles of Economics (3)
PR: ECON 202. The functioning of the market system in the determination of factor prices. Consideration of the problems of agriculture, economic development, international trade, and labor.

ECON 301 Intermediate Price Theory (4)
PR: ECON 203. Theoretical analysis of the determination of product and factor prices under different market structures.

ECON 307 Economic History of the United States (3)
PR: Junior standing or consent of instructor. An analysis of the historical growth and development of the American economy.

ECON 311 Intermediate Money, Income and Employment Theory (4)
PR: ECON 203. Theoretical analysis of the determination of national income and employment, including an examination of the monetary system.

ECON 321 Business and Economic Statistics (4)
PR: ECON 203, MATH 115 and STAT 201. The use of statistical methods as scientific tools in the analysis of economic and business problems. Emphasis is placed on the collection, analysis, and interpretation of quantitative economic and business data. (Same as STAT 321).

ECON 331 Economics of Labor (3)
PR: ECON 203. A survey of the growth, structure, objectives, and collective bargaining practices of organized labor groups.

ECON 341 International Economics (3)
PR: ECON 203. Fundamental principles of international trade and foreign exchange, including the balance of payments and problems of foreign economic policy.
ECON 361 Economics of Agricultural Production, Pricing, and Policy (3)
PR: ECON 203. The application of economic analysis to the agricultural sector of the economy.

ECON 371 Mathematical Economics (3)
PR: ECON 203 and MATH 123. An introduction to the mathematical tools of modern economic analysis.

ECON 381 Economics of Public Utilities (3)
PR: ACCY 103 or 307 and ECON 203 or consent of instructor. The nature of public utilities, the economics of rate determination, and regulatory policy.

ECON 401 Managerial Economics (3)
PR: ECON 203. The uses of economic analysis in economic decision-making and business policy formulation.

ECON 411 Comparative Economic Systems (3)
PR: ECON 203. An analysis of the fundamental institutions of the American economic system and a comparison of the American economic system with other economic systems.

ECON 421 Economic Statistical Analysis (5)

ECON 431 Public Finance in the American Economy (3)
PR: ECON 203. Analysis of fiscal institutions and decision-making in the public sector of the American economy; budget planning and execution, taxation, debt, and theory of taxes.

ECON 432 Fiscal Economics (3)
PR: ECON 431. The economics of government spending and taxation; analysis of the fiscal role and instruments of government and their effects on the economy. Fiscal policy, intergovernmental fiscal relationships, inflation, debt.

ECON 441 Economic Development (3)
PR: ECON 203. The processes and problems of economic development.

ECON 451 Econometrics (3)
PR: ECON 371 and ECON 421. Application of modern statistical methods to economic theory and problems.
ECON 461 Business and Government (3)  
PR: ECON 203. A survey of the most significant public policies affecting business firms.

ECON 471 History of Economic Thought (3)  
PR: ECON 203. A study of the leading ideas of the major contributors to the development of economic thought.

ECON 481 Economics of Urban Areas (3)  
PR: ECON 203. An analysis of the economic problems arising from and associated with the growth of cities and suburban areas within metropolitan districts.

ECON 499 Undergraduate Research (2-5)  
PR: Consent of instructor. May be repeated for credit.

ECON 611 Economics of the Firm (3)  
PR: Graduate standing. The application of microeconomic theory to planning and decision-making in the business firm. Emphasis will be on: demand estimation, production functions, measurement of costs, pricing objectives and policies, and government antitrust policy.

ECON 621 Aggregate Economics – Income, Employment, and Growth (3)  
PR: Graduate standing. The application of macroeconomic theory to planning and decision-making in the business firm. Emphasis will be on: aggregate supply and demand; determinants of consumption, saving, and investment; government’s stabilization role; and forecasting of economic fluctuations.

BUSINESS EDUCATION - DEVELOPMENTAL

EDBE 101 Introductory Typewriting (3)  
For the student with no previous instruction in typewriting. Development of basic elements in using the typewriter as a tool of literacy and communications.

EDBE 102 Communications Production-I (3)  
PR: EDBE 101 or equivalent. Continuation of development of skills in
speed and accuracy and introduction to skill building procedures in communications production.

EDBE 103 Communications Production-II (3)
PR: EDBE 102 or equivalent. Expansion of communications production development, speed and accuracy.

EDBE 201 Principles of Shorthand-I (3)
PR: Concurrent enrollment in EDBE 101 or equivalent. For students with no previous instruction in shorthand. Introduction to basic theory of Gregg Shorthand, vocabulary development, and speed building.

EDBE 202 Principles of Shorthand-II (3)
PR: EDBE 102, and EDBE 201 or equivalents. A continuation in the study of shorthand theory, vocabulary development, and speed building.

EDBE 203 Principles of Shorthand-III (3)
PR: EDBE 103, and EDBE 203 or equivalents. Development and refinement of sustained shorthand dictation, speed and vocabulary development.

EDBE 301 Shorthand Dictation (3)
PR: EDBE 103, and EDBE 203 or equivalents. Continued development and refinement of shorthand dictation and introductory communications productions.

EDBE 302 Shorthand Transcription (3)
PR: EDBE 102, and EDBE 301. Gregg Shorthand dictation and refinement of communications production.

EDBE 305 Office Technology (3)
PR: EDBE 103 or equivalent. Basic operation and function of technological media in modern business offices.

EDBE 405 Principles of Business - Vocational Education (3)
PR: Senior standing. Study of historical development of business-vocational education with specific emphasis on identification and interpretation of present day trends and problems.

EDBE 406 Office Systems and Procedures (3)
PR: EDBE 302 and 305. Study of the responsibilities of the executive secretary and office supervisor; records management, travel services, case studies in human relations in executive level job performance.
EDBE 601 Curriculum Innovations in Business Education (3)
PR: CI. A critical analysis of the business curricula in post secondary schools; development of philosophy, objectives, and design of innovative programs in business.

ELEMENTARY EDUCATION - DEVELOPMENTAL

EDEL 301 Teaching Mathematics in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Consideration of selected concepts; organizing for instruction, techniques and activities; class and individual diagnosis; remedial procedures.

EDEL 302 Mathematics Programs in the Elementary School (3)
PR: EDEL 301. Analysis of teaching arithmetic, geometry and measurement; philosophy and objectives; instructional materials; current research and new curricula.

EDEL 306 Music in the Elementary School (3)
Fundamental procedures for teaching elementary school music, stressing appropriate music materials and activities for different age groups; selected experiences in music.

EDEL 307 Literature for Children (3)
PR: Admission to Phase II or consent of instructor. General survey of books and materials; criteria for analysis and evaluation; types of books available considered in terms of interests, needs, and abilities of children.

EDEL 311 Basic Foundations of Reading (3)
PR: Admission to Phase II or consent of instructor. Introduction to reading, principles, procedures and organization, current practices; analysis of reading materials; correlation with child development; investigation of research.

EDEL 312 Reading in the Elementary School (3)
PR: EDEL 311. Study of specific techniques and materials used to develop reading comprehension, vocabulary and rate; organizing and directing a reading lesson; individual differences; evaluation procedures.

EDEL 315 Teaching Science in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.
EDEL 316 Elementary School Curriculum (3)
PR: Admission to Phase II. Basic scope and sequence of the elementary school curriculum; philosophical concepts; techniques and materials for instruction; patterns of organization; planning for instruction.

EDEL 317 Teaching Social Science in the Elementary School (3)
PR: EDEL 315. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

EDEL 401 Programs in Early Childhood Education (3)
PR: Admission to Phase II or consent of instructor. Overview of the philosophy, content, facilities, instructional materials, and activities appropriate for children ages 3, 4, and 5; current research and new curricula. Concurrent laboratory experiences.

EDEL 402 Developmental Processes in Early Childhood (3)
PR: Admission to Phase II or consent of instructor. Developmental processes and their relationship to learning and curriculum development; influence of the family and culture.

EDEL 403 Language and Cognition of Young Children (3)
PR: Admission to Phase II or consent of instructor. Language in the learning, patterns of thinking, and perceiving of young children. Theories of language and symbolic experience, verbal and non-verbal behavior.

EDEL 404 Organization of Instruction in Nursery-Kindergarten Education (3)
PR: Admission to Phase II or consent of instructor. Organization of instruction; selected themes and concepts; teaching procedures; evaluation techniques; special problems. Concurrent laboratory experiences.

EDEL 405 Language Arts in the Elementary School (5)
PR: Admission to Phase II or consent of instructor. Content, principles, materials and techniques involved in teaching, speaking, listening, writing, and spelling in the elementary school; organizing for instruction.

EDEL 406 Art in the Elementary School (3)
Basic principles, purposes, scope and sequence; organization for instruction; evaluation of activities; selected art experiences.

EDEL 407 Classroom Diagnosis and Treatment of Reading Difficulties (3)
PR: EDEL 311 and 312. Principles and techniques of diagnosis and remedial teaching with the disabled reader; factors related to reading problems - physiological, psychological, cultural; materials for instruction.
EDEL 408 Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in natural sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 409 Social Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in the social sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 415 Teaching Elementary School Health and Physical Education (3)
PR: Admission to Phase II or consent of instructor. Observation, organization, practice, and conduct of health and physical education activities in the elementary school.

EDEL 455 Elementary School Curriculum (4)
PR: Bachelor’s degree or consent of instructor. Advanced study of the elementary school curriculum; patterns of organization; school services; individual subject areas; school related activities; investigation of trends; research and new curricula.

EDEL 456, 457 Directed Study in Elementary Education (3-5,3-5)
Workshop for the improvement of the elementary school curriculum. Open to in-service teachers.

EDEL 630 Trends in Elementary School Reading Education (3)
PR: Rank III Certificate or CL. Analysis of historical development and current trends in reading research.

PHYSICAL EDUCATION - DEVELOPMENTAL

EDPE 305 Rehabilitation Training Techniques (3)
PR: Admission to Phase II or consent of instructor. Recognition and rehabilitation of sports injuries including first aid.

EDPE 306 Administration and Coaching (3)
PR: Admission to Phase II or consent of instructor. Development of optimal individual and team performance in interscholastic athletics.
EDPE 307 School and Community Recreation (3)
PR: Admission to Phase II or consent of instructor. Knowledge and skills of after school activity and summer recreational programs.

EDPE 308 Human Performance Learning (5)
PR: Admission to Phase II or consent of instructor. Theories of movement and factors influencing the learning of gross and fine motor skills. (Includes lecture and laboratory).

EDPE 309 Kinesiology (5)
PR: Admission to Phase II or consent of instructor. The application of the structure of man to the study of human movement. (Includes lecture and laboratory).

EDPE 321 Exercise Physiology — Cardiovascular (5). See page 238.

EDPE 322 Exercise Physiology - Respiratory (5)
PR: ZOOL 234. A study of metabolic costs and respiratory adjustment to exercise.

EDPE 324 Instructional Analysis in Tennis (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 325 Instructional Analysis in Aquatics (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 326 Instructional Analysis in Gymnastics and Tumbling (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 327 Instructional Analysis in Golf (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 328 Instructional Analysis in Wrestling (M) (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 329 Choreography of Contemporary Dance (W) (2)
Dance production as an art form.

EDPE 330 Rhythms, Notation, Meter and Form (2)
Elements common to music and movement.
**EDPE 405** Organization and Administration of Secondary School Physical Education (3)
Nature and scope of secondary school physical education athletic, intramural and adaptive programs.

**EDPE 406** Organization and Administration of Elementary School Physical Education (3)
Nature and scope of elementary school physical education athletic, intramural and adaptive programs.

**EDPE 407** Family Living Concepts (5)
The ideas and principles of healthy family living.

**EDPE 408** Contemporary Health Hazards (5)
The effects of drugs and other mood modifiers.

**EDPE 601** Philosophical Foundations of Physical Education (3)
PR: Rank III Certificate or Cl. Analysis of the forces and events leading to the development of current concepts in physical education.

NOTE: For physical education electives (ESPE) to satisfy the Environmental Studies Requirements, see pages 177-178.

**PROFESSIONAL LABORATORY - APPLICATION**

**EDPL 407** Student Teaching (3-12)
PR: Admission to Phase II. Student teaching in a public elementary or secondary school under the supervision of a selected classroom teacher.

**EDPL 408** Teaching Strategies (3)
PR: Admission to Phase III. Seminar taken concurrently with student teaching. Problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

**EDPL 409** Teaching Strategies (4)
PR: Bachelor's degree or consent of instructor. A seminar taken concurrently with Teaching Practicum, EDPL 465. Advanced problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

**EDPL 458** Supervision of Professional Laboratory Experiences (3)
PR: Consent of instructor. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the Teacher Education Associate or Supervising Teacher.
EDPL 459 Supervision of Professional Laboratory Experiences (1)
Laboratory
PR: Consent of instructor. Participation as a Teacher Education Associate or Supervising Teacher in the Florida Technological University laboratory experience program. May be taken concurrently with EDPL 458.

EDPL 465,466 Teaching Practicum (5,5)
PR: Bachelor's degree and approved application. Directed observation, participation, and teaching in an elementary or secondary school under the direction of a selected teacher.

SECONDARY EDUCATION - DEVELOPMENTAL

EDSE 303 School Programs (3)
A study of the public school curriculum, Kindergarten through grade twelve.

EDSE 304 Instructional Techniques (3)
PR: Admission to Phase II. Procedures, applications, and evaluation of technical skills a teacher may employ in the classroom.

EDSE 305 Secondary School Curriculum (3)
PR: Admission to Phase II. Study of total school patterns with emphasis on new trends including: individual subject areas, administration, supervision, school services and school related activities.

EDSE 306 Business Instructional Analysis-I (4)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in typing instruction.

EDSE 307 English Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and material having special application for teaching English.

EDSE 308 Mathematics Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching mathematics.

EDSE 309 Science Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school
curriculum and survey of methods and materials which have special application for teaching science.

EDSE 405 Business Instruction Analysis-II (3)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in shorthand and related instruction.

EDSE 406 Business Instructional Analysis-III (3)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in accounting and basic business instruction.

EDSE 407 Foreign Language Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching foreign language.

EDSE 408 Physical Education Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching physical education.

EDSE 409 Social Science Instructional Analysis (4)
PR: Admission to Phase II. Study of instructional programs in Social Sciences; objectives; materials; techniques; organization of instruction; evaluation procedures; current research.

EDSE 415 Reading in the Secondary School (3)
PR: Admission to Phase II or consent of instructor. Developmental reading for the junior and senior high school pupil.

EDSE 475 Secondary School Curriculum (4)
PR: Bachelor's degree or consent of instructor. Advanced study of secondary school curriculum; patterns of organization, school services, individual subject areas, school related activities; investigation of trends, research and new curricula.

EDSE 476,477 Directed Study in Secondary Education (2-5,2-5)
Workshop for improvement of the secondary school curriculum. Open to in-service teachers.

EDSE 478 Instructional Analysis in Business (4)
PR: Bachelor's degree or consent of instructor. Advanced study of the
EDSE instructional programs in Business; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 479 Instructional Analysis in English (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in English; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 485 Instructional Analysis in Foreign Language (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Foreign Language; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 486 Instructional Analysis in Mathematics (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Mathematics; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 487 Instructional Analysis in Physical Education (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Physical Education; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 488 Instructional Analysis in Science (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Science; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 489 Instructional Analysis in Social Sciences (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Social Sciences; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 491 Contemporary Biology (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as BSCS biology and other modern approaches to secondary school biology. (Same as BIOL 491.)

EDSE 492 Contemporary Chemistry (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems, and advanced topics included in courses such as CHEM Study and other modern approaches to secondary school chemistry. (Same as CHEM 491.)
EDSE

EDSE 493 Contemporary Mathematics (3)
PR: Admission to Phase II or consent of instructor. Concepts, problems, and advanced topics included in courses such as SMSG mathematics and other modern approaches to secondary school mathematics. (Same as MATH 491.)

EDSE 494 Contemporary Physics (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. (Same as PHYS 491.)

EDSE 601 Curriculum Planning (3)
PR: Rank III Certificate or CI. Identifying major concepts, writing objectives, listing activities and developing course layouts for a secondary school subject area.

TEACHING ANALYSIS

EDTA 206 Human Development (3)
Analysis of basic principles and applications in growth and learning from conception through adolescence. EDTA 307 recommended concurrently.

EDTA 305 Principles of Evaluation (3)
PR: Admission to Phase II. Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306 Learning Theory (3)
PR: Admission to Phase II. Study of applications of learning theory to classroom teaching.

EDTA 307 Teaching Analysis (5)
Initial requirement; an opportunity to examine and participate in general and specific dimensions of teaching with socio-economic factors emphasized. EDTA 206 recommended concurrently.

EDTA 405 Teaching Analysis (4)
PR: Bachelor's degree or consent of instructor. Advanced study, examination, and participation in general and specific dimensions of the teaching task in current American Society.
EDTA 406 Human Development (4)
PR: Bachelor's degree or consent of instructor. Advanced study of basic principles and their application in physical, intellectual, emotional and social development from conception through adolescence.

EDTA 407 Learning Theory (4)
PR: Bachelor's degree or consent of instructor. Analysis and advanced study of the applications of learning theory as applied to teaching in the elementary and secondary classroom.

EDTA 490 Senior Seminar: Education in Human Affairs (2)
Provides an overview of basic objectives, strategies, and techniques in education. This course primarily intended for the senior student, is offered as one of the advanced Environmental Studies Seminars. Not open to the student enrolled in the College of Education.

EDTA 501 Social Factors in American Education (3)
PR: Rank III Certificate or Cl. Analysis of general and specific aspects of American education as they relate to Social and Behavioral Sciences.

EDTA 502 Education, Human Development and Learning (3)
PR: Rank III Certificate or Cl. Recent research in Human Development and learning relevant to contemporary American education.

EDTA 503 Measurement and Evaluation in Education (3)
PR: Rank III Certificate or Cl. Rationale and construction of evaluative instruments, parametric and non-parametric statistics, interpretation of data.

EDTA 504 Research Design and Techniques in Education (3)
PR: EDTA 603 or Cl. Design rationale and construction, sampling methods, control and limits.

ELECTRICAL ENGINEERING & COMMUNICATIONS SCIENCES

EECS 311 Switching Theory (3)

EECS 321 Electrical Networks (3)
Continuation of ENGR 322.
EECS 322 Electronic Engineering (4)
Continuation of ENGR 323. Three lectures, three hours laboratory.

EECS 331 Electromechanics (3)
PR: ENGR 322. Energy conversion by electromechanical methods.

EECS 341 Electromagnetic Fields (3)
PR: ENGR 322. Introduction to fields and waves.

EECS 411 Logical Component Design (3)

EECS 412 Logical Systems Design (4)
PR: EECS 411. Systems investigation, design, and operation of digital computers; Study of a basic hardware set and a basic software set.

EECS 413 Digital Systems and Circuits (4)
PR: ENGR 323 and EECS 311. Investigation of digital components and their incorporation into circuits for digital applications. Three lectures, three hours laboratory.

EECS 414 Analog Computers (3)
PR: EECS 321. Theory, operation and application of analog computers.

EECS 421 Electrical Networks (3)
PR: EECS 321 and 341. Traveling electromagnetic waves with application to distributed parameters. Two lectures, three hours laboratory.

EECS 431 Electrical Machinery (3)
PR: EECS 331. Methods and techniques of systems analysis applied to the dynamics of electrical machinery. Two lectures, three hours laboratory.

EECS 442 Microwaves (4)
PR: EECS 341 and 421. Microwave devices and systems. Three lectures, three hours laboratory.

EECS 443 Coherent Optics Applications (3)
PR: EECS 341. Theory and design of coherent optical systems, lasers, information, processing, communications, holography.
EECS 451 Communication Theory (4)
PR: EECS 321 and 322. Information transmission, modulation, and noise. Three lectures, three hours laboratory.

EECS 453 Random Processes (3)
PR: MATH 321 and ENGR 321. Random variables, averaging, sampling, elements of probability theory.

EECS 461 Semiconductor Devices (3)
PR: EMS 411. Semiconductors with non-uniform impurity distribution; impurity diffusion, analysis of drift transistor with constant built-in field. Junction field-effect transistors. Two lectures, three hours laboratory.

EECS 462 Solid State Systems (3)
PR: EECS 461. Selection and use of device models in system analysis.

EECS 464 Solid State Electronics (3)

EECS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 497 Undergraduate Seminars (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGINEERING CORE

ENGR 101 Engineering Graphics (3)
Spatial visualization, sketching, and graphical presentation as a form of engineering communication. Engineering drawing, descriptive geometry, manipulation of vectors and graphical solution techniques. Two lectures, one two-hour laboratory.

ENGR 103 Creative Design (3)
PR: Approval of instructor. Role of the engineer as a creative design professional. Emphasis on understanding the creative process and factors
that influence it. Attitudes and viewpoints of the designer and an investigation of the techniques of analysis, synthesis, and evaluation used. Two lectures, two hours recitation-laboratory.

ENGR 111 Engineering Concepts (3)
PR: Approval of instructor. Lecture-demonstrations of the basic physical phenomena essential to the understanding of engineering structures, machines, processes, and systems. Primary emphasis on (1) mechanics and materials behavior, (2) electrical phenomena, (3) thermo-fluid mechanics phenomena. Two lectures, two hours laboratory-demonstration.

ENGR 151,152 Chemical Foundations of Engineering (3,3)
PR: Satisfactory performance in one year of high school chemistry and one year of high school physics or other natural science or CHEM 111; CR: Math 221. Atomic structure and bonding; properties of gases, solids, liquids, and solutions; chemical equilibrium, thermodynamics and kinetics; organic and inorganic reactions. Lecture, demonstration and recitation.

ENGR 201,202,203 Engineering Design Case Studies (1,1,1)
PR: Sophomore standing and ENGR 103. A discussion of the role of various engineering disciplines in the creative design process. Invited guest speakers will review pertinent case studies. Primary emphasis on (1) mechanical engineering-aerospace sciences projects, (2) civil engineering-environmental sciences projects, and (3) electrical engineering-communication sciences projects. Attention will be given to engineering administration, systems, and materials throughout. Two hours lecture discussion.

ENGR 211 Engineering Analysis—Statics (4)
CR: MATH 321. Force systems, resultants, equilibrium, distribution forces. First and second moments of areas and masses.

ENGR 221 Electrical Science (4)
PR: MATH 321 and ENGR 311. Basic concepts of electricity and magnetism. The development of fundamental laws and their engineering application. Lecture, demonstration, and laboratory.

ENGR 311 Engineering Analysis—Dynamics (4)

ENGR 312 Mechanics of Materials (5)
PR: ENGR 211; CR: MATH 331. Concepts of stress and strain, Hooke's Law; strength and deflection of axial force members, shafts in torsion and beams in flexure; combined stress; stability of columns. Lecture, demonstration and laboratory.
ENGR 321 Principles of Electrical Engineering (4)
PR: ENGR 221; CR: MATH 331. Introduction to fundamental laws of electrical circuits, network analysis, magnetic properties, electromagnetic interaction, magnetic and electric fields, and electrical and magnetic properties of solids. Lecture, demonstration, and laboratory.

ENGR 322 Electrical Networks (4)
PR: ENGR 321. Mathematical analysis of networks and linear systems. Lecture, demonstration, and laboratory.

ENGR 323 Electronic Engineering (4)
PR: ENGR 322. Electronic circuits. Lecture, demonstration, and laboratory.

ENGR 331 Thermodynamics (4)

ENGR 332 Fluid Mechanics (4)
PR: ENGR 331. Basic principles of continuum fluid mechanics and transport concepts. Lecture, demonstration, and laboratory.

ENGR 341 Engineering Economic Analysis (3)
PR: MATH 221. Economic evaluation of engineering alternatives.

ENGR 342 Systems Analysis (3)
PR: ENGR 341; CR: ENGR 371. Integrated systems approach to the analysis, design, and optimization of engineering hardware and software.

ENGR 351 Structure & Properties of Materials (3)
PR: ENGR 152 and MATH 222. Quantum mechanical introduction to atomic bonding. Classification of solids. Crystal structures and the diffraction of X-rays by crystals. Effects of imperfections on physical properties.

ENGR 352 Materials of Engineering (3)
PR: ENGR 351. Properties and behavior of engineering materials. Laboratory investigations and text criteria. Lecture demonstrations and laboratory.

ENGR 361 Man and His Environment (3)
PR: ENGR 152 or equivalent. Man's interaction with the air, water, and land environment in which he lives. The role of engineering in control of the physical environment for the benefit of mankind.
ENGR 371 Probability and Statistics for Engineers (3)
PR: MATH 321. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as STAT 335).

ENGR 431 Transport Processes (3)
PR: ENGR 332. Analogous development and application of the principles of viscous fluid flow, conduction and convective heat transfer, and mass diffusion processes.

ENGR 441 Technical Communications (3)
PR: Junior standing. Composition for technical papers, reports and scientific articles suitable for publication. Oral and written presentation.

ENGR 442 Operations Research (3)

ENGR 443 Engineering Administration (3)
PR: Senior standing. Engineering organization and administration; delegation of authority and responsibility; effective utilization of resources; compensation structure, labor-management relations.

ENGR 471,472 Engineering Mathematical Analysis (3,3)
PR: MATH 321, MATH 331. The application of mathematical methods to engineering problems including vector and tensor fields, state space techniques, orthogonal curvilinear coordinates and orthogonal functions.

ENGR 473 Analytical Methods in Engineering (3)
PR: ENGR 471 or consent of instructor. The kinematics and dynamics of ideal field theory problems and their mathematical expression. Formulation of boundary conditions. Basic concepts of complex potential and conformal mapping with application to problems in fluid flow, thermal and electric potential.

ENGR 474 Analytical Methods in Engineering (3)
PR: ENGR 471 or consent of instructor. Engineering applications of partial differential equations and the concept of the mathematical modeling of physical problems. Development of characteristic properties of equations and methods of solutions including separation of variables, transform techniques and method of characteristics.

ENGR 475 Numerical Analysis in Engineering (3)
PR: MATH 321, MATH 331. Application of numerical techniques to the
solution of complex engineering problems. Analysis and organization of practical programs for numerical solution of initial, boundary and eigenvalue problems.

ENGINEERING — INTERDISCIPLINARY COURSES

ENGR 481 Man and Machine (3)
The influence and inter-relationship of invention and technical progress on the evolution of social forms and institutions.

ENGR 482 Engineering & Technology in History (3)
Important developments in engineering and technology and their effect on society and our socio-economic processes and institutions.

ENGR 483 Technology and Social Change (3)
Review of existing theories of social change, analysis of the role of technology as related to social change, and study of contemporary events in technology and their possible impact on society.

ENGR 484 Science in History (3)
Examination of the reciprocal relations of science and society from ancient to recent times.

ENGR 485 Topics in Urban Development (3)
Production, distribution, and consumption of various commodities and engineering relationships to distribution, internal structure, and function of urban developments. Inter-relationship of engineering, social, economic, and cultural phenomena.

ENGR 486 Science, Engineering, and Ethical Systems (3)
A study of the contributions of science and engineering to society in light of moral, social, and ethical principles. A systematic and critical consideration of representative ethical problems created by advancing technology.

ENGR 487 Historical Architecture (3)
Architecture as the realization of changing aesthetic and cultural ideals and the expression of changing forms of society. Development of understanding of our physical environment through a study of the forms, functions and determinants of architecture.

ENGR 490 Engineering in Human Affairs (2)
The impact of engineering on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced
Environmental Studies Seminars. Not open to students majoring in the College of Engineering.

ENGR 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGR 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGR 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGR 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGINEERING MATERIALS SCIENCES

EMS 411 Semiconductor Materials and Devices (3)
PR: ENGR 323 and ENGR 351. Electrical conduction in semiconductors; basic concepts of drift, diffusion, carrier generation and recombination. Physical theory and models for the junction diode and transistor. Representation in terms of linear incremental and non-linear charge control models.

EMS 412 Electronic Properties of Materials (3)

EMS 413 Thermodynamic Properties of Materials (3)
PR: ENGR 351. Fundamental concepts of thermodynamics and kinetics are applied to the study of solid state phase transformations, equilibrium in multi-component systems and diffusion in solids.

EMS 421 Theory of Crystalline Solids (3)
PR: ENGR 351. Modern Theory of crystalline materials. Topics treated include crystal structure, mechanical, thermal and transport properties.

EMS 431 Engineering Materials and Processes (3)
PR: Senior standing. Basic properties and metallurgy of engineering materials including ferrous and non-ferrous metals and alloys; studies of cermets and plastics; production and processing of engineering materials. Two lectures, three hours laboratory.
EMS 432 Metallurgy (3)
PR: EMS 431. Extraction of metals, crystal and atomic structure, phase transformations, tests and properties of high temperature metals and refractories, and introduction to spectroscopy. Two lectures, three hours laboratory.

EMS 441 Materials Processing (3)
PR: ENGR 351. Phase transformations, crystallography, growth processes, kinetics of solid state transformations; technology of high and low temperatures, vacuum systems, high pressure, and clean environments.

EMS 451 Mechanical Properties of Materials (3)
PR: ENGR 351. Fundamentals of mechanical behavior of engineering materials. Selected topics include fracture, creep, fatigue, and microscopic interpretation of results of mechanical testings.

EMS 452 Engineering Materials (3)

EMS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

EMS 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

EMS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

EMS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGLISH

ENG 101 Composition I (3)
Expository writing, with emphasis on effective communication. Grammar and mechanics will not form a major part of this course; if the student is deficient, he will achieve proficiency through independent study. Writing topics to be based on selected readings.

ENG 102 Composition II (3)
PR: ENG 101 or equivalent. Writing practice involving the mechanics of
research and evaluation of varied readings. A documented paper will demonstrate the student's grasp of writing principles studied.

ENG 103 Current Literature (3)
PR: ENG 101 or equivalent. Contemporary prose and poetry selected to invite the interest of students in literature. Writing related to readings.

Note on Freshman English Program:
ENG 101, 102 and 103 may be taken to satisfy the State Department requirement for certification in secondary school teaching or for transfer to colleges that require one full year of Freshman English. Students who intend to major in English, English Education, or Library Science must take ENG 102 and 103, and must complete ENG 210 before enrolling in any English courses numbered above 210 with the exception of ENG 301.

ENG 210 Principles of Literature (3)
Literary terms, forms, and types, illustrated in a wide variety of readings.

ENG 211 Survey of English Literature to 1625 (3)

ENG 212 Survey of English Literature, 1626-1798 (3)

ENG 213 Survey of English Literature, 1798-1914 (3)

ENG 300 Expository Writing (3)
Training in advanced composition, primarily intended for students in the College of Education. Theory and practice of the several forms and applications of expository writing.

ENG 301 Professional Report Writing (3)
For scientific, professional, or business students. The first half of the course lays emphasis upon clear expository writing with particular attention to business letters and memoranda. The second half of the course stresses the production of professional reports or articles in the student's particular discipline.

ENG 302 Creative Writing Workshop I (3)
PR: Permission of instructor. Intensive practice in the essential tool-skills of writing, applicable to more advanced work in non-fiction, fiction, poetry, and drama.

ENG 303 Creative Writing Workshop II (3)
PR: ENG 302 or approval of instructor. Analytic study of the work of established writers; practice in producing short forms of fiction or non-fiction. (May be repeated once for credit.)
ENG 304 Creative Writing Workshop III (3)
PR: ENG 302 or approval of instructor. Analytic study of the work of
established poets; practice in producing original verse in both traditional
and modern forms.

ENG 311 Survey of American Literature, 1588-1865 (3)

ENG 312 Survey of American Literature, 1865-1914 (3)

ENG 313 Survey of American Literature Since 1914 (3)

ENG 314 Survey of British Literature Since 1914 (3)

ENG 316 Continental European Fiction Since 1900 (3)
A selection of significant works of fiction written in various languages
during the present century, read in translation.

ENG 321 Exploring Poetry (3)
A broad, cultural approach to poetry, with emphasis upon the major
themes and preoccupations of poets of all ages.

ENG 361 Practical Criticism (3)
Student evaluation of selected fiction, poetry, and drama through practical
exercises in literary criticism.

ENG 371 Principles of Linguistics (3)
Basic linguistic concepts and an introduction to historical, descriptive,
comparative, and applied linguistics. Recommended for students in
Secondary Education as well as majors in English.

ENG 401 Senior Writing Workshop I (3)
PR: Evidence of writing skill satisfactory to the instructor. Analysis of
significant non-fiction; market research; intensive writing practice leading
to a completed body of non-fiction writing suitable for publication.
Should be taken in conjunction with ENG 498. (May be repeated once for
credit).

ENG 402 Senior Writing Workshop II (3)
PR: Evidence of writing skill satisfactory to the instructor. Analysis of
significant fiction; market research; intensive writing practice leading to a
completed body of fiction writing suitable for publication. Should be
taken in conjunction with ENG 498. (May be repeated once for credit).

ENG 403 Senior Writing Workshop III (3)
PR: Evidence of writing skill satisfactory to the instructor. Analysis of
significant poetry; market analysis; intensive writing practice leading to a completed body of verse suitable for publication. Should be taken in conjunction with ENG 498. (May be repeated once for credit).

ENG 404 English Versification (3)
Intensive study of the structural characteristics of English poetry, metrical systems, rhyme, scansion, and poetic rhetorical devices.

ENG 410 Contributions of Minority Groups to American Literature (3)
Contributions of linguistic and ethnic groups of non-English origin to the literature of the United States.

ENG 421 Studies in 17th Century English Literature I (3)
Early prose, poetry, and drama (exclusive of Shakespeare).

ENG 422 Studies in 17th Century English Literature II (3)
Literature of the Puritan domination.

ENG 423 Studies in 17th Century English Literature III (3)
Literature of the Restoration period.

ENG 424 Studies in 18th Century English Literature I (3)
Selected works of writers of the first 40 years of the 18th Century.

ENG 425 Studies in 18th Century English Literature II (3)
The rise of the English novel and the "Age of Johnson."

ENG 426 Studies in 18th Century English Literature III (3)
Early romanticism; the Gothic novel and the novel of manners; the drama of the 18th Century.

ENG 427 Studies in 19th Century English Literature I (3)
English Literature from 1798-1832: the Romantic Triumph in poetry and prose.

ENG 428 Studies in 19th Century English Literature II (3)
English Literature from 1832 to 1870: the early Victorians.

ENG 429 Studies in 19th Century English Literature III (3)
English Literature from 1870 to 1914: later Victorians and transitional writers.

ENG 430 Chaucer (3)
*The Canterbury Tales, Troilus and Criseyde,* and other works.
ENG 431 Shakespeare's Comedies (3)

ENG 432 Shakespeare's Histories (3)

ENG 433 Shakespeare's Tragedies (3)

ENG 434 Milton (3)
Paradise Lost, Paradise Regained, Samson Agonistes, shorter poems, and selected prose.

ENG 441 English Drama to 1642 (exclusive of Shakespeare) (3)

ENG 442 Restoration and 18th Century English Drama (3)

ENG 444 The British Novel in the 18th Century (3)

ENG 445 The British Novel in the 19th Century (3)

ENG 446 The American Novel in the 19th Century (3)

ENG 451 British and American Fiction Since 1900 (3)

ENG 452 British and American Poetry Since 1900 (3)

ENG 453 British and American Drama Since 1900 (3)

ENG 460 Historical Survey of Literary Criticism (3)
Study of the major critics from classical antiquity through the modern era.

ENG 461 British Literary Criticism to 1900 (3)
PR: ENG 460. Study of the major critics in England from the Renaissance through the Victorian period.

ENG 462 British Literary Criticism Since 1900 (3)
PR: ENG 460. Study of the important critical theories and principles developed in England from the Edwardian era to the present.

ENG 463 Literary Criticism in the United States (3)
PR: ENG 460. Study of American Literary critics to the present.

ENG 465 Literature for Adolescents (3)
Selecting and evaluating books for adolescents, with emphasis on the uses of books in the development of young people. Required for secondary school English teachers and students seeking certification in Library Sciences.
ENG 471 History of the English Language (3)

ENG 472 Modern English Grammar (3)
English etymology, parts of speech, inflection, syntax, and modern usage. Required for secondary school English teachers.

ENG 473 English Linguistics (3)
PR: ENG 371. The application of modern linguistic methods to the phonology, morphology, and syntax of present-day English.

ENG 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

ENG 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

ENG 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

ENG 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENVIRONMENTAL STUDIES PHYSICAL EDUCATION

The Environmental Studies Physical Education Elective Program is designed to enhance the physical and mental development of the student. A student may receive three quarter hours credit towards graduation by enrolling and satisfactorily completing any one of the following courses:

ESPE 301 Aquatics (3)
A study and application of the physiological benefits of basic aquatic developmental skills - elementary and advanced strokes, water safety, springboard diving, and interval training. (2 hours lecture; 2 hours activity)

ESPE 302 Body Development (M) (3) or
ESPE 303 Body Development (W) (3)
A study and application of the metabolic, neuromuscular, and cardiovascular changes resulting from select physical activities. (2 hours lecture; 2 hours activity)
ESPE

ESPE 304 Golf (3)
A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity. (2 hours lecture; 2 hours activity)

ESPE 305 Tennis (3)
A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity. (2 hours lecture; 2 hours activity)

ESPE 306 Life Saving (3)
Instruction, training and certification in basic life saving swimming skills. (2 hours lecture; 2 hours activity)

ESPE 307 Scuba Diving (3)
Instruction, training and certification in basic diving skills with self-contained underwater breathing apparatus. Students may be required to supply their own equipment. (2 hours lecture; 2 hours activity)

ESPE 308 Interpretive Dance (3)
Instruction and analysis of creative dance performance as an art form. (2 hours lecture; 2 hours activity)

FINANCE

FIN 301 Finance (5)
PR: ACCY 103, ECON 203, STAT 201. Fundamentals of obtaining and administering funds to meet short-term and long-term capital requirements.

FIN 311 Risk and Insurance (5)
PR: ECON 203 or consent of instructor. Principles and methods of risk reduction and specialization, with particular emphasis on insurance.

FIN 321 Investments (3)
PR: ECON 203 or consent of instructor. Principles of determining investment policy for individual and institutional portfolios.

FIN 331 Money and Banking (4)
PR: ECON 203 or consent of instructor. The nature of money, the functioning of the commercial banking system and its relation to the level of economic activity, and the activities of the Federal Reserve System and Treasury.
FIN 341 Real Estate (3)
PR: Junior standing. Basic principles of real estate ownership, its use and transfer, brokerage, management, legislation, and importance to the economy.

FIN 411 Financial Institutions (3)
PR: FIN 301. The operation of financial institutions and an analysis of their role in the economy.

FIN 421 Security Analysis (5)
PR: FIN 301. The problems of selecting securities for various investment purposes.

FIN 431 Financial Management (3)
PR: FIN 301. Analytical techniques for dealing with financial problems and their application to corporate financial management.

FIN 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

FIN 601 Capital Budgeting and Financial Planning (3)
PR: Graduate standing. Financial planning and forecasting, sources of long-term capital, concepts of the cost of capital, and capital budgeting.

FIN 611 Working Capital and Financial Problems (3)
PR: Graduate standing. Managing cash, receivables and inventories; sources of short-term funds; and special problems such as expansion, contraction, merger and failure.

FRENCH

FRE 101 Elementary French Language and Civilization (3)
Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to French culture.

FRE 102 Elementary French Language and Civilization (3)
PR: FRE 101 or equivalent. Continuation of FRE 101.

FRE 103 Elementary French Language and Civilization (3)
PR: FRE 102 or equivalent. Continuation of FRE 102.
FRE 201 Intermediate French Language and Civilization (3)
PR: FRE 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive readings and further study of French culture.

FRE 202 Intermediate French Language and Civilization (3)
PR: FRE 201 or equivalent. Continuation to FRE 201.

FRE 203 Intermediate French Language and Civilization (3)
PR: FRE 202 or equivalent. Continuation of FRE 202 with greater emphasis on French civilization from the Middle Ages to the present.

FRE 301 French Composition (4)
PR: FRE 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled written compositions required.

FRE 303 French Conversation (4)
PR: FRE 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

FRE 311 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance.

FRE 312 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works of the seventeenth and eighteenth centuries.

FRE 313 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works of the nineteenth and twentieth centuries.

FRE 401 French Phonetics and Diction (2)
PR: FRE 303 or equivalent. French phonology with emphasis on phonic groupings.

FRE 422 Seventeenth Century French Theater (5)
PR: FRE 312. Corneille, Racine, and Molière. A study of the life and principal works of the authors.
FRE 431 French Literature of the Eighteenth Century (3)
PR: FRE 312. The philosophical movement: Montesquieu, Vauvenargues, Voltaire, Diderot, Buffon.

FRE 441 Nineteenth Century French Literature (3)
PR: FRE 313. Romanticism.

FRE 442. Nineteenth Century French Literature (3)
PR: FRE 313. Realism and naturalism.

FRE 443 Nineteenth Century French Literature (3)
PR: FRE 313. Parnassianism and symbolism.

FRE 451 Twentieth Century French Literature (5)
Contemporary French drama and poetry.

FRE 453 Twentieth Century French Literature (3)

FRE 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

FRE 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

GEOLOGY

GEOL 100 Physical Geology (3)
The earth's materials and the processes by which they interact: crystallography, volcanism, earthquake activity, drifting of continents, movements of the sea floor, sedimentation, erosion, glaciation, and origin of landforms.

GEOL 101 Physical Geology Laboratory (1)
Laboratory exercises involving crystal forms and cleavage, rocks and minerals, sedimentation processes, and linking of geology and landform. Recommended to be taken concurrently with GEOL 100.

GEOL 105 Historical Geology (3)
PR: GEOL 100. The evolution of life on earth as documented by fossil remains. Use of fossils and modern flora and fauna to reconstruct environments of the past.
GEOL 106 Historical Geology Laboratory (1)
Laboratory exercises illustrating the principles of historical geology. Recommended to be taken concurrently with GEOL 105.

GERMAN

GER 101 Elementary German Language and Civilization (3)
Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to German culture.

GER 102 Elementary German Language and Civilization (3)
PR: GER 101 or equivalent. Continuation of GER 101.

GER 103 Elementary German Language and Civilization (3)
PR: GER 102 or equivalent. Continuation of GER 102.

GER 201 Intermediate German Language and Civilization (3)
PR: GER 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of German culture.

GER 202 Intermediate German Language and Civilization (3)
PR: GER 201 or equivalent. Continuation of GER 201.

GER 203 Intermediate German Language and Civilization (3)
PR: GER 202 or equivalent. Continuation of GER 202 with greater emphasis on German civilization from the Middle Ages to the present.

GER 301 German Composition (4)
PR: GER 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled compositions required.

GER 303 German Conversation (4)
PR: GER 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.
HIST HISTORY

HIST 201 Western Culture and Civilization (3)
The rise of culture and civilization in the West from the earliest times to the eve of the Renaissance.

HIST 202 Western Culture and Civilization (3)
Continuation of HIST 201. Europe from its feudal-manorial state through the Napoleonic era.

HIST 203 Western Culture and Civilization (3)
Continuation of HIST 202. The Romantic era, the influence of liberalism, nationalism, and modern industrialism upon political, social, economic, and intellectual life.

HIST 311 American History (3)
An introduction to the culturally interrelated problems of American values and institutions; past and present. The historical basis of the evolving institutions of the United States is demonstrated in economic life, government, education, family life, and religion.

HIST 312 American History (3)
Continuation of HIST 311. A topical study of America's evolving political institutions in response to population growth, national wealth, and changing needs and demands in an age of science and technology; the urban-suburban revolution, social stratification, the family, and educational and religious institutions and values.

HIST 313 American History (3)
Continuation of HIST 312. The public and private sectors of the American mixed economy; U. S. involvement in world affairs, economically, politically, and militarily.

HIST 330 Latin American History: The Colonial Period (3)
A survey course in Latin American history to the beginning of the Wars of Independence in 1810.

HIST 331 Latin American History: The 19th Century (3)
Continuation of HIST 330.

HIST 332 Latin American History: The 20th Century (3)
Continuation of HIST 331.
HIST 412 United States History: 1492-1789 (3)
The history of the British Colonies from their founding until the organization of the U. S. Government under the Constitution.

HIST 413 United States History: 1789-1824 (3)
The writing of the Constitution, the Federalist decade, Jeffersonian Democracy, the War of 1812, and emergence of New Nationalism.

HIST 414 United States History: 1820-1860 (3)
Administration of Andrew Jackson to the Civil War.

HIST 415 United States History: 1860-1876 (3)
Civil War, Reconstruction, and impact of industrialism.

HIST 416 United States History: 1878-1918 (3)
The Agrarian Revolt, the Spanish-American War, and the Progressive Era.

HIST 417 United States History: 1914-1940 (3)
The Progressive Reforms of Woodrow Wilson, World War I, post-war prosperity, the Depression, and the New Deal.

HIST 418 United States History: 1941-present (3)
Contemporary America from World War II.

HIST 420 United States Diplomatic History (5)
The foreign relations of the United States from the founding of the Republic to the present.

HIST 430 Latin American History: The ABC Countries (5)
A survey of the histories of Argentina, Brazil, and Chile from the colonial period to the present.

HIST 452 The Middle Ages and The Renaissance (5)
PR: HIST 201. The ideas and institutions of Medieval Europe; the great cultural and intellectual achievements of the 15th and 16th Centuries in Italy and Northern Europe; the rise of the territorial states; and the effects of nationalism on the political and social structure of Europe.

HIST 455 The Age of the Reformation and the Enlightenment (5)
PR: HIST 202. Europe from the 16th Century to the 18th Century.

HIST 457 Modern Europe: 1789-1918 (5)

HIST 459 Modern Europe: 1918 to the Present (5)
HIST 461 Medieval British History: Earliest Times to 1485 (3)

HIST 462 Modern British History: 1485-1815 (3)

HIST 463 Modern British History: 1815 to the Present (3)

HIST 464 British Empire and Commonwealth (3)
The development of the British Empire and Commonwealth since the American Revolution.

HIST 466 British History: Tudor-Stuart Period (3)
A study of the Tudor-Stuart period, with particular emphasis on the civil/religious conflicts of the time.

HIST 470 History of Russia to 1856 (3)
HIST 471 History of Russia: 1856-1917 (3)

HIST 472 History of the Soviet Union: 1917 to the Present (3)

HIST 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

HIST 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

HIST 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

HUMANITIES

HUM 301 Western Humanities I (3)
The Graeco-Roman world and the early Middle Ages.

HUM 302 Western Humanities II (3)
PR: HUM 301. The high Middle Ages, the Renaissance, and the early Baroque period.

HUM 303 Western Humanities III (3)
PR: HUM 302. The modern world, from the age of the Enlightenment to the contemporary period.

HUM 311 Egypt and the Near East (3)
The life and thought of ancient civilizations as revealed through art and archaeology.
HUM 315 China and Japan (3)
The art, literature, and thought, as related to religion and custom, during periods of highest achievement.

HUM 317 India and Indonesia (3)
The cultural traditions and the principal monuments in art and literature.

HUM 319 Russia (3)
Outstanding examples of Russian music, dance, drama, and fiction, with attention to the distinctive mixture of cultural influences they reveal.

HUM 335 Afro-American Culture (3)
The artistic influence of the Negro in America.

HUM 351 Latin-American Cultures (3)
The art and archaeological remains of Inca, Mayan, and Aztec civilizations; their influences on Latin-American music, art and literature.

HUM 355 American Ideas I (3)
A history of ideas course using the American Studies approach and emphasizing the significance of Puritanism, capitalism, nationalism, and the idea of progress in the development of American ideals.

HUM 356 American Ideas II (3)
Continuation of HUM 355 with emphasis on the effect of industrialism, pragmatism, individualism, and the cycles of reform and reaction.

HUM 371 Contemporary American Culture (3)
An integrated view of the art, music, and literature of our time, revealing the impact of depersonalization, alienation, revolt, and the search for self-awareness.

HUM 411 The Classical Temper (3)
An exploration of the meaning of "classical" in architecture, music, painting, sculpture and literature, with attention to various revivals of the style.

HUM 413 The Romantic Mood (3)
A comparative study of selected romantic art works in various periods and places, including modern America.

HUM 415 Realism, Naturalism, and Impressionism (3)
A definition and comparison of these terms as related to various art forms and as seen in selected works from Chaucer to the present.
HUM 421 Purposes of Art I (3)
The variety and evolution of visual arts used for religious purposes from primitive times to modern.

HUM 422 Purposes of Art II (3)
Visual art for non-religious purposes: as a reflection of nature, of authority, of imagination.

HUM 441 Purposes of Music (3)
Religious and social functions of music and its relationships with other arts.

HUM 451 The Epic (3)
The epic hero as a model of human ideals in various cultural settings.

HUM 455 The Tragic View (3)
A study of tragedy as an archetype of human experience and a view of life; examples from the literature of Greece, Rome, France, England and America.

HUM 459 The Comic View (3)
A definition of the comic and satiric views of life and a study of examples in literature from Aristophanes to Ionesco.

HUM 471 Mythic Literature (3)

HUM 473 Confession Literature (3)
A comparative study of works offering insight into the minds and personal lives of influential thinkers from St. Augustine to the present.

HUM 491 Humanities Forum (2)
An elective and open discussion, with variable content, for students in all areas of the University. A selected topic will be discussed each week in a two-hour session.

HUM 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

HUM 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

HUM 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.
HUMANITIES AND SOCIAL SCIENCES

HSS 490 Senior Seminar: Arts and Social Sciences in Human Affairs (2)
The contemporary world as viewed distinctively by the various disciplines represented in the College of Humanities and Social Sciences. Students may choose the section offered by any one of several departments. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to the students in the College of Humanities and Social Sciences.

INDUSTRIAL ENGINEERING & MANAGEMENT SYSTEMS

IEMS 311 Engineering Law (3)
PR: Junior standing. Influence of contract, property, and tort law upon engineering activities; contracts, agency, partnerships, corporations, liens, and expert testimony.

IEMS 331 Work Analysis and Design (3)
PR: Junior standing or approval of instructor. Analysis, design and operation of work systems; their relationship to job evaluation and wage payment systems. Laboratory assignments.

IEMS 332 Statistical Quality Control (3)
Statistical concepts and methods applied to the control of quality of manufactured products. (Same as STAT 332).

IEMS 361 Engineering Applications of Computer Methods (3)
PR: MATH 223, COMP 102 or approval of instructor. Methods of structuring engineering problems for computers; general characteristics and performance measures of computers and auxiliary equipment. Introduction to computer-aided design and time-sharing systems, case studies. Laboratory assignments.

IEMS 411 Industrial Administration (3)
PR: ENGR 443. Role of the engineer in manufacturing management. Basic functions, departmentation, authority relationships, and methods of control.

IEMS 421 Operations Research Models (3)
PR: ENGR 471. Inventory and replacement models, queueing theory, sequencing, forecasting, dynamic programming.
I EMS 422 Network Analysis (3)

I EMS 423 Analysis of Industrial Operations (3)
PR: Minimum of 12 credits of I EMS course work. An extensive and intensive analysis of industrial operations for optimum utilization of resources. Laboratory assignments.

I EMS 433 Queueing Theory (3)

I EMS 435 Probability for Engineers (3)
PR: ENGR 371. Combinatorial analysis, sample space, events, probability, discrete and continuous random variables, probability distributions with applications in engineering. (Same as STAT 435).

I EMS 436 Statistics for Engineers (3)
PR: ENGR 371. Significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation with applications in engineering. (Same as STAT 436).

I EMS 442 Engineering Economic Analysis (3)
PR: ENGR 341 and I EMS 435. The engineering economic audit, breakeven point analysis, variable budget control of manufacturing costs, cost analysis, and product pricing.

I EMS 443 Analysis of Decision Processes (3)
PR: ENGR 371 and ENGR 341. Methods of making economic decisions; effects of risk, uncertainty, and strategy on managerial economic decision.

I EMS 451 Human Engineering (3)
PR: Senior standing. Man-machine systems; design and conduct of human engineering studies. Laboratory assignments.

I EMS 452 Human Factors in Space Travel (3)
PR: I EMS 451. Artificial environments and environmental control of upper atmosphere and space.

I EMS 461 System Simulation with Digital Computers (3)
PR: I EMS 361. Methods and procedures for simulating large scale systems with digital computers. FORTRAN and GASP programming languages are used. Laboratory assignments.
IEMS 462 Information Acquisition (3)
PR: IEMS 435. The design of systems to collect data for use in managerial decision models, job evaluation, wage payment, production standards, queueing studies, engineering evaluations and reliability predictions.

IEMS 463 Project Engineering (3)
PR: Senior standing. Role of the project engineer in research and development, emphasizing the complete sequence of steps from project proposal to project completion. Analytical techniques such as CPM, PERT/COST will be considered.

IEMS 464 Design of Industrial Operations (3)
PR: IEMS 331. Planning, analyzing, controlling and evaluating production systems. Laboratory assignments.

IEMS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

INHALATION THERAPY

Course offerings in Inhalation Therapy, INHT, will be published as a supplement to this Bulletin.

JOURNALISM

JRN 320 Press Photography (3)
Learning the use of the still camera, darkroom procedures, role of the photographer.

JRN 321 Copy Editing (3)
Fundamental of copy editing for printed media, including selection, processing and display of news.
JRN 322 Information Processing (3)
Planning content and format of newspapers and other periodicals; layout, dummying, departmental editing, copy desk management.

JRN 330 History of Journalism (3)
Development of newspapers and magazines, the press associations and the growth of the electronic media.

JRN 331 Film Criticism (3)
PR: Consent of instructor. The practice of writing movie reviews: students will review at least one film a week during the course.

JRN 420 News Writing (3)
PR: Consent of instructor and student must have a minimum ability to type. Development of skills in gathering and writing for the mass media.

JRN 421 Editorial and Column Writing (3)
PR: Consent of instructor. Building the editorial page, backgrounding and interpreting the news.

JRN 422 Public Affairs Reporting (3). See page 238.

JRN 423 Writing for the Mass Media (3)
PR: Consent of instructor. Students write for a certain segment of the mass media of their own choosing. Will include playwriting, creative writing, article writing, etc.

JRN 424 Critical Writing (3)
PR: Consent of instructor. Practice in writing reviews of plays, concerts, and books.

JRN 425 Feature Writing (3)
PR: Consent of instructor. Writing of feature articles for newspapers and magazines.

JRN 426 Public Relations (3)
Principles and practice of public relations, the means of gaining publicity and influencing people.

JRN 427 Public Relations Campaigns (3)
The planning and execution of a public relations campaign; use of research and coordination of elements of the campaign.

JRN 431 International Communications and the Foreign Press (3)
A study of the news communicating systems of the world, the role of foreign correspondents, the foreign press.
JRN 432 The Mass Media in Developing Countries (3)
Role of the media in the developing areas of the world, how the nations and media help shape the direction of one another.

JRN 433 Propaganda and Psychological Warfare (3)
Propaganda and psychological warfare principles with a study of the activities engaged in by nations.

JRN 434 Principles of Advertising (3)
Fundamentals of advertising theory and practice including social and economic aspects.

JRN 435 Advertising Media (3)
PR: JRN 434 or consent of instructor. Evaluations of advertising media in terms of their ability to serve the advertiser's communication needs and the tools of analysis used in determining media success.

JRN 436 Advertising Copy (3)
PR: Consent of instructor. The writing and preparation of copy for advertisements.

JRN 437 Advertising Campaigns (3)
PR: JRN 436 or consent of instructor. The planning and execution of an advertising campaign; use of research and coordination of elements of the campaign.

JRN 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

JRN 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

LIBRARY SCIENCE

LIB 301 Library Materials (3)
A general introduction to the selection, acquisition, processing, and use of all types of library materials.

LIB 321 Library Organization and Administration I (3)
Principles and practices of library organization and administration as applied to all types of libraries, including personnel, financial support, organization and servicing of the collection, planning and equipping libraries, planning and evaluating services.
LIB 322 Library Organization and Administration II (3)
PR: LIB 321 or equivalent. Continuation of LIB 321.

LIB 334 Selection and Acquisition of Library Materials (3)

LIB 384 History of Books and Libraries (3)
A history of books and libraries from ancient times to the present, in relation to the society of which they were a part.

LIB 424 School Library Administration (3)
PR: LIB 322. Principles and practices of library administration applied to elementary and secondary school libraries.

LIB 431 Cataloging and Classification I (3)
PR: LIB 321. Introduction to the theory and practice of cataloging and classifying library materials. Practical problems in descriptive cataloging, subject cataloging and Dewey Decimal classification as practiced in small libraries.

LIB 432 Cataloging and Classification II (3)
Additional study in the theory and practices of cataloging and classification. Introduction to Library of Congress classification and subject headings, divided and classified catalogs, and filing rules.

LIB 444 Reference Materials and Services (3)
Selection, evaluation, and use of basic reference materials, with emphasis on functions and services of a reference department.

LIB 451 Introduction of Educational Media (4)
Principles and practices of communication theory and its application in the classroom; selection, evaluation, acquisition, storage, and use of non-book materials and related equipment; organizing audio-visual services.

LIB 452 Preparation and Production of Instructional Media (3)
Selection, evaluation, and production of instructional materials with emphasis on production of projected materials; display and presentation techniques.
MANAGEMENT

MGMT 301 Management (5)
PR: ECON 203. Fundamentals of management underlying the solution of problems relating to the organization and operation of business enterprises.

MGMT 324 Production Management (5)
PR: MGMT 301. Principles and methods of production viewed from a managerial decision-making level.

MGMT 344 Organization Theory (5)
PR: MGMT 301. Elements in organizations and the processes by which they develop and influence behavior are considered.

MGMT 347 Human Relations in Management (3)
PR: MGMT 344. The individual, interpersonal and group relations and inter-group and organizational problems in business.

MGMT 364 Personnel Management (5)
PR: MGMT 301. An investigation of personnel practices and interpersonal relationships involved in managing employees. Internal problems of labor control and the utilization of human resources are considered.

MGMT 367 Industrial Relations (3)
PR: MGMT 301. The impact of trade unionism on industrial relations; current problems, conflicts and trends; the development of managerial approaches to achieve labor-management cooperation.

MGMT 424 Production Management Problems (3)
PR: MGMT 324. Problems in the management of industrial enterprise. Management principles and mathematical analysis applied to manufacturing; product development and production; materials and production control; employee relations.

MGMT 464 Personnel Problems (3)
PR: MGMT 364. Case studies in personnel problems directed toward the application of personnel management theory and concepts to organization problems.

MGMT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.
MGMT

MGMT 601 Management Process (3)
PR: Graduate standing. Theory of management for complex organizations.

MGMT 611 Organizational Behavior (3)
PR: Graduate standing. The relationship of human behavior to organization performance, including motivation, leadership, organizational environment, social environment and communication.

MARKETING

MKTG 301 Marketing (5)
PR: ECON 203. Study of functions, institutions and basic problems in marketing of goods and services in our economy.

MKTG 324 Marketing Environment (3)
PR: MKTG 301. A course emphasizing the relationship of firm to firm, to government, to labor and to other organized groups or institutions as they interact with the marketing function of the firm.

MKTG 326 Consumer Market Behavior (3)
PR: MKTG 301 and PSY 308. An analysis of consumer motivation, buying behavior, market adjustment and product innovation. This course is concerned with the behavioral aspects of the marketing process from the producer to the ultimate user or consumer.

MKTG 334 Pricing Policies (3)
PR: MKTG 301. The nature of marketing decisions and pricing; marketing organization and the pricing process; price theories and pricing models.

MKTG 344 Marketing Logistics (3)
PR: MKTG 301 and ECON 321 or BADM 311. The ecology, analysis and development of integrated distribution systems; the application of quantitative tools, economic analysis, transportation and marketing management in the analysis and interpretation of the design and physical flow of goods through marketing network alternatives.

MKTG 364 Advertising Management (3)
PR: MKTG 301. Analysis of field of advertising; purposes, techniques, media, organization, and role of research; economic and social aspects of advertising.
MKTG 367 Sales Management (3)
PR: MKTG 301. Problems confronting sales manager; training in sales techniques; sales objectives and policies; organization; and administration of sales force.

MKTG 384 Marketing Research (5)
PR: MKTG 301 and ECON 321. Study of research procedures and techniques applicable to problem solving in marketing. The marketing management process is analyzed; the underlying concepts related to the information needed to serve the processes are explored; and the incorporation of information resources into the management function is demonstrated.

MKTG 469 Advertising and Sales Management (3)
PR: MKTG 364, MKTG 367, and PSY 308. Managerial approach to advertising and sales management. Designed to acquaint the student with the methods of demand analysis and its application to the interrelationship to marketing management, advertising management, and sales management.

MKTG 495 Marketing Policies and Strategies (3)
PR: MKTG 384 and MKTG 469. Marketing problems and policies are explored with emphasis placed on the decision-making process.

MKTG 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MKTG 601 Marketing Policy (3)
PR: Graduate standing. Marketing policy formulation and decision-making with respect to planning, pricing, promoting, and distributing.

MATHEMATICS

MATH 100 Principles of Mathematics (4)
PR: Two years of high school mathematics. A study of some topics in mathematics with primary emphasis on developing conceptual understanding and broadening insights into mathematics. Designed specifically for use in the Environmental Studies Program.

MATH 104 Elementary Mathematics (3)
PR: Two years of high school mathematics. Properties of numbers; factoring; fractions; solution of linear and quadratic equations; systems of equations; graphing; problem solving. For those students whose preparation in mathematics is insufficient for MATH 106, 108 or 115.

*May not be offered before 1971.
MATH 106 College Algebra (5)
PR: MATH 104 or three years of high school mathematics including two in algebra. Algebraic and transcendental functions; sequences; inequalities; determinants; permutations; combinations; mathematical induction; partial fractions.

MATH 108 Analytic Trigonometry (3)
PR: MATH 104 or two years of high school algebra, and one year of high school plane geometry. The circular functions and their identities; inverse circular functions; equations and inequalities involving circular functions; graphs of the circular functions and their inverses; functions of angles; complex numbers.

MATH 110 Elementary Functions (5)
PR: Two years of high school algebra and one year of plane geometry and one half year of trigonometry. Properties of algebraic and transcendental functions; inequalities and related topics.

MATH 115 Finite Mathematics (5)
PR: MATH 104 or one and one half years of high school algebra and one year of plane geometry or two years of high school algebra. Mathematical logic, set theory, counting and the binomial theorem, probability.

MATH 198 Freshman Seminar (3)
PR: Consent of instructor. This course develops the student's ability to analyze and solve logical and mathematical problems by careful analysis of selected problems. (Required of all majors in the Mathematical Sciences.)

MATH 221,222,223 Calculus with Analytic Geometry (4,5,5)
PR: MATH 110, or MATH 106 and 108, or the equivalent. Analytic geometry; functions; limits; continuity; derivatives; antiderivatives; definite integrals; calculus of transcendental functions; techniques of integration; indeterminate forms; vectors.

MATH 314 Boolean Algebra (4)
PR: MATH 223 or consent of instructor. Axiomatic development of Boolean algebra; the algebras of sets, logic and circuits as Boolean algebras.

MATH 315,316 Introduction to Number Theory (3,3)
PR: Consent of instructor. Divisibility; primes and composites; divisors; multiples; Euclid's algorithm; Diophantine equations; modulo arithmetic; simple continued fractions. Intended for prospective teachers of mathematics.
MATH 317 Matrices (3)
PR: MATH 223. Elementary properties of matrices; special real and complex matrices; determinants and inverses; rank and systems of equations; transformations; eigenvectors; diagonalization; quadratic forms.

MATH 318,319 Linear Algebra (3,3)
PR: MATH 223. A detailed analysis of finite dimensional linear spaces including bases, subspaces, dual spaces, quadratic forms, and applications to geometry.

MATH 321 Intermediate Calculus and Analytic Geometry (5)
PR: MATH 223. Solid analytic geometry; functions of several variables; partial derivatives; infinite sequences and series; vector calculus; line and surface integrals; multiple integrals.

MATH 331 Differential Equations (4)
PR: MATH 321. First order ordinary differential equations; equations with constant coefficients; the method of variation of parameters; step-by-step integration; reduction of order; Picard's method, the method of Frobenius; introduction to input-output analysis and transform methods.

MATH 341 Vector Analysis (3)
PR: MATH 321. Scalar and vector products; limits, derivatives and integrals of vector valued functions of real vectors; the directional derivative and vector operators; the theorems of Green, Gauss and Stokes; generalized curvilinear coordinates; applications in engineering and physical sciences.

MATH 351,352 Foundations of Geometry (3,3)
PR: Consent of instructor. Euclidean geometry; geometry of transformations; projective and other non-Euclidean geometries.

MATH 411,412,413 Algebraic Structures (3,3,3)
PR: MATH 223. An introduction to the properties of groups, rings, polynomial rings, integral domains and fields.

MATH 414 Semi-groups and Groups (3)
PR: Consent of instructor. An axiomatic development of basic properties of semi-groups and groups.

MATH 420 Sequences and Series (3)
PR: Consent of instructor. Convergence of infinite sequences and series; double series; infinite products. Intended for prospective teachers of mathematics.
MATH 421, 422, 423 Advanced Calculus (3, 3, 3)
PR: MATH 321. Limits, sequences and concepts of continuity; differentiation and integration; derivatives of integrals; infinite series and concepts of convergence; the Bolzano-Weierstrass theorem and the Heine-Borel theorem; extensions in Euclidean n-space.

MATH 424 Lebesgue Theory (3)
PR: MATH 423. Inner and outer measure; measurable sets and functions; the Lebesgue integral.

MATH 425 Techniques of Complex Variables (3)
PR: MATH 321. Analytic functions; integration in the complex plane; Laurent series and residue calculus, inversion of Laplace transforms; conformal mappings; applications in engineering and the physical sciences.

MATH 426, 427 Theory of Complex Variables (3, 3)
PR: MATH 425. Analytic and harmonic functions; Cauchy's theorem and its implications; the maximum modulus principle; series expansions; decomposition of meromorphic functions into partial fractions; analytic continuation; asymptotic expansions; the Mittag-Leffler Theorem; integral functions of finite order; Riemann surfaces.

MATH 428 The Number System (3)
PR: MATH 420. An axiomatic development of the natural numbers followed by a constructive development of the real and complex numbers. Intended for prospective teachers of mathematics.

MATH 429 Foundations of Calculus (3)
PR: MATH 420. Functions; limits; continuity; differentiation and integration. This course is a study of the basic structure of the calculus and is recommended for prospective teachers of mathematics.

MATH 431 Ordinary Differential Equations (3)
PR: MATH 331. Systems of equations; the Wronskian; Abel's identity; integrating factors and adjoint equations.

MATH 432 Theory of Differential Equations (3)
PR: MATH 331. The existence and uniqueness of solutions; oscillation theory; asymptotic solutions; stability.

MATH 434 Partial Differential Equations (3)
PR: MATH 331. Separation of variables; orthogonality and Fourier series; classification of equations; solutions in different coordinate systems; methods of characteristics; the Fourier integral transform and Dirac's delta function.
MATH 435 Boundary Value Problems (3)
PR: MATH 434. Adjoint forms and Green’s functions; applications in engineering and the physical sciences.

MATH 436 Special Functions (3)
PR: MATH 331. Special functions represented as series, products and integrals; generating functions and recursion formulas; orthogonal expansions and interrelations between special functions. Emphasis will be on the Bessel, Legendre, gamma and hypergeometric functions with an introduction to other polynomial sets.

MATH 437 Laplace Transforms (3)
PR: MATH 331. The Laplace and Z transforms; solutions of ordinary and partial differential equations; application to circuit analysis and difference equations.

MATH 438 Transform Calculus (3)
PR: MATH 331. Fourier, Hankel and other transforms with applications to physical problems; the transformations of distributions.

MATH 461 Basic Topology (3)
PR: MATH 421 or 428. Compactness; connectedness; general metric spaces; topological spaces; limit points.

MATH 462 Concepts in Topology (3)
PR: MATH 461. Topology of surfaces, Euler characteristic; spheres with handles and crosscaps; algebraic invariants; combinatorial topology.

MATH 490 History of Mathematics (3)

MATH 491 Contemporary Mathematics (3)
PR: Consent of the instructor. Concepts, problems, and advanced topics included in current approaches to secondary mathematics. (Same as EDSE 493).

MATH 496 Special Topics (2-6)
PR: Consent of the instructor. May be repeated for credit.

MATH 497 Undergraduate Seminar (2-6)
PR: Consent of the instructor. May be repeated for credit.
MATH 498 Independent Study (2-6)
PR: Consent of the instructor. May be repeated for credit.

MATH 499 Undergraduate Research (2-6)
PR: Consent of the instructor. May be repeated for credit.

MECHANICAL ENGINEERING & AEROSPACE SCIENCES

MEAS 341 Mechanisms (2)
PR: ENGR 311. Relative motions of machine parts; cams, rolling contact, gearing, and flexible connectors. Synthesis of mechanisms. One lecture, three hours laboratory.

MEAS 342 Dynamics in Design (2)
PR: MEAS 341. Experimental mechanics; dynamic measurements; applications of dynamics in design.

MEAS 351 Measurement Systems (3)
PR: ENGR 312 and 322. Application of system design concepts to measurements. Fundamental theory of static and dynamic measurements. Behavior of transducers individually and in open-loop systems. Validation of experimental data. Measurements are considered as information transfer accompanied by energy transfer. Two lectures, one laboratory lecture, two hours laboratory bi-weekly.

MEAS 371 Fluid Mechanics (3)
PR: ENGR 332. Continuation of ENGR 332. Topics in gas dynamics including shock waves, viscous flow analysis and solutions in boundary layer theory.

MEAS 372 Thermodynamics of Mechanical Systems (3)
PR: ENGR 331. Applied thermodynamics; gas mixtures, power cycles, and reactive systems.

MEAS 411 Aerodynamics (3)
PR: ENGR 332. Principles of subsonic and supersonic flight; airfoils in compressible and incompressible flow; flow about a body; thin airfoil and finite airfoil theory.

MEAS 413 Stability and Control (3)
PR: MEAS 411. Application of elementary aerodynamic principles to static and dynamic stability and control surface theory.
MEAS 421 Space Mechanics (3)
PR: ENGR 311. Dynamics with applications to aeronautical and astronautical problems, orbits and trajectories, motion in a resisting medium, performance and optimization of multi-stage rockets.

MEAS 423 Vibration Analysis (3)

MEAS 424 Flight Vehicle Structures (3)
PR: CEES 351. Space structures; thin-walled structures; load factors; non-symmetrical bending and transverse shear; shear center and shear flow; semi-monocoque construction, fuselage rings; multicelled structures; sandwich panels, fatigue.

MEAS 432 Propulsion Systems (3)
PR: MEAS 372. Analysis of jet propulsion systems including turbojets, ramjets, and rockets.

MEAS 436 Mechanical Power Systems (3)
PR: MEAS 372. Analysis and design of large power generating systems and components thereof with emphasis on steam plants utilizing both chemical and nuclear fuels. Boiler, turbine, condenser, and auxiliary equipment design and performance analysis.

MEAS 437 Energy Conversion (3)
PR: MEAS 372 and PHYS 344. Unconventional methods of energy conversion; particular emphasis on fuel cells, thermo-electrics, thermionics, solar energy, photovoltaics, nuclear, and magnetohydrodynamics.

MEAS 441 Principles of Design (3)
PR: MEAS 342. Design Procedures; force and motion analysis; failure modes; stress and deflection analysis; stress concentration; fatigue; selected components.

MEAS 451 Measurement Systems (3)
PR: MEAS 351. Extension of fundamental measurement principles; discussion of DC, sine wave and pulse carrier systems and of unbalance and reference-balance measuring methods; simple computing-type transducer. Two lectures, two hours lecture-laboratory.

MEAS 471 Statistical Thermodynamics (3)
MEAS 472,473 Heat Transfer (3)

MEAS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MEDICAL TECHNOLOGY

Course offerings in Medical Technology, MEDT, will be published as a supplement to this Bulletin.

MEDICAL RECORDS SCIENCE

Course offerings in Medical Records Science, MRSC, will be published as a supplement to this Bulletin.

MICROBIOLOGY

MICR 200 General Microbiology (3)
PR: 8 hours in biological sciences. Fundamentals of microbiology, morphology, metabolism.

MICR 201 General Microbiology Laboratory (1)
Laboratory procedures and principles in microbiology; taken concurrently with MICR 200.

MICR 210 Culture Media and Reagents (2)
PR: MICR 200. Preparation of differential, selective, and enrichment media; reagents used in microbiology.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>MICR 220</td>
<td>Sanitary Science and Public Health (3)</td>
<td></td>
<td>BIOL 100</td>
<td>Theories of diseases; sanitary procedures in water purification; sewage disposal, refuse collection; milk supplies; swimming pools; air contamination; personal and public health.</td>
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<tr>
<td>MICR 300</td>
<td>Advanced General Microbiology (4)</td>
<td></td>
<td>MICR 200</td>
<td>PR: Advanced fundamental theory and technique.</td>
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<td>MICR 320</td>
<td>Pathogenic Microbiology (4)</td>
<td></td>
<td>MICR 200</td>
<td>PR: PR: MICR 200. Microorganisms producing disease in man and other animals; means of transmission; protection against disease.</td>
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<tr>
<td>MICR 322</td>
<td>Microbiology of Water and Sewage (4)</td>
<td></td>
<td>MICR 200</td>
<td>PR: MICR 200. Organisms in water and their relationship to production and distribution of potable water; disposal of sewage.</td>
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<tr>
<td>MICR 350</td>
<td>Soil Microbiology (4)</td>
<td></td>
<td>MICR 200</td>
<td>PR: MICR 200. Soil microorganisms and their role in ammonification, nitrification, and biological processes.</td>
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<tr>
<td>MICR 430</td>
<td>Microbial Physiology (4)</td>
<td></td>
<td>MICR 300</td>
<td>PR: MICR 300. Relationship between structure and function in microorganisms.</td>
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<tr>
<td>MICR 440</td>
<td>Determinative Microbiology (4)</td>
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<td>PR: 11 hours in microbiology. Microbial classification, rules of nomenclature, bacterial code and identification of species.</td>
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<tr>
<td>MICR 470</td>
<td>Virology (4)</td>
<td></td>
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<td>PR: 12 hours of microbiology and CHEM 123. Nature of viruses and Rickettsiae including their structure, propagation, isolation, and identification.</td>
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<tr>
<td>MICR 496</td>
<td>Special Topics (2-5)</td>
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<td>PR: Consent of instructor. May be repeated for credit.</td>
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<tr>
<td>MICR 497</td>
<td>Undergraduate Seminar (2-5)</td>
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<td>PR: Consent of instructor. May be repeated for credit.</td>
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<tr>
<td>MICR 498</td>
<td>Independent Study (2-5)</td>
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<td>PR: Consent of instructor. May be repeated for credit.</td>
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<tr>
<td>MICR 499</td>
<td>Undergraduate Research (2-5)</td>
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<td>PR: Consent of instructor. May be repeated for credit.</td>
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MUS MUS

MUSIC

Courses are classified as follows:


FEES: Each course involving private lessons has a music fee of $12.50 per quarter hour credit. Class Piano MUS 111 has no music fee.

MUS 101, 102, 103 Music Theory (3,3,3)
The fundamental course in basic musicianship integrating the various musical skills with the development of the student's musical perception and understanding. Required of all music majors.

MUS 104, 105, 106 Music Literature (2,2,2)
Analysis and discussion of important musical works, Baroque to contemporary periods; introduction to stylistic differences of the various musical eras. Primarily for music majors.

MUS 111 Class Piano (2)
May be repeated for credit.

MUS 112 Voice (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 113 String (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 114 Woodwind (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 115 Brass (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 116 Percussion (1)
One half-hour private instruction per week. May be repeated for credit.
MUS 117 Organ (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 118 Piano (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 201,202,203 Music Theory (3,3,3)
PR: MUS 103 or equivalent. Continuation of course content of MUS 101 through 103 integrated with intensive training in aural comprehension.

MUS 211 Piano (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 212 Voice (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 213 String (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 214 Woodwind (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 215 Brass (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 216 Percussion (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 217 Organ (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 218,219,220 Piano Literature (2,2,2)
PR: Proficiency in an applied instrument or voice (200 level or above) or consent of instructor. Survey of stringed keyboard literature from the sixteenth century to the present with emphasis on technical, formal and performance problems.
MUS 221,222,223 Song Literature (2,2,2)
PR: Proficiency in an applied instrument or voice (200 level or above) or consent of instructor. Survey of the development of the art song from the middle ages to the present with emphasis on technical, formal and performance problems.

MUS 301,302,303 Counterpoint (3,3,3)
PR: MUS 203. Analysis and creative writing in the contrapuntal-harmonic technique of Baroque composers through the various methods of the twentieth century.

MUS 304 Madrigal Singers (1)
PR: Consent of instructor by audition. May be repeated for credit. Participation in a select vocal ensemble for the study and performance of madrigals and similar works from the fourteenth century to the present.

MUS 307 Concert Choir (1)
PR: Consent of instructor. May be repeated for credit. Study, rehearsal and performance of choral works of all styles and periods. Open to all students.

MUS 308 Band (1)
Participation in a chamber or large ensemble for purposes of studying and performing band literature. Open to all students. May be repeated for credit.

MUS 309 Orchestra (1)
Participation in a chamber or large ensemble for purposes of studying and performing symphonic orchestral literature. Open to all students. May be repeated for credit.

MUS 311 Piano (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 312 Voice (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 313 String (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.
MUS 314 Woodwind (2)  
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 315 Brass (2)  
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 316 Percussion (2)  
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 317 Organ (2)  
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 320, 321, 322 Orchestration (3, 3, 3)  
PR: Proficiency in an applied instrument or voice (300 level or above) or Music Theory 203. Preliminary study of band and orchestral instruments. Scoring for band, orchestra and various instrumental combinations.

MUS 340, 341, 342 Music History (3, 3, 3)  
Music in Western Civilization traced from its primitive sources to the present; emphasis on composers' styles in relation to the cultural backgrounds of the various eras.

MUS 350 Composition (2-5)  
PR: MUS 303 or consent of instructor. May be repeated for credit. Creative work in large and small forms in the area of choral, instrumental and keyboard media.

MUS 390 Fundamental Music Skills (3)  
(For non-majors). Primarily for the prospective teacher as an introduction to the basic music skills necessary for teaching in elementary and secondary schools: notation, rhythm, singing, basic piano skills and fundamentals of conducting.

MUS 399 Introduction to Music (3)  
(For non-majors). The study of music through listening, readings and discussions leading to greater enjoyment of music.

MUS 401, 402, 403 Form and Analysis (3, 3, 3)  
PR: MUS 303. Formal aspects of the styles of major composers with an emphasis on orchestral literature.
MUS 411 Piano (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 412 Voice (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 413 String (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 414 Woodwind (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 415 Brass (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 416 Percussion (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 417 Organ (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 421 Piano (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 422 Voice (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 423 String (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 424 Woodwind (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.
MUS 425 Brass (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 426 Percussion (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 427 Organ (2-5)
PR: Consent of instructor. Hours of instruction are variable. May be repeated for credit.

MUS 450,451,452 Music of the Twentieth Century (3,3,3)
Problems of contemporary style; electronic methods, literary and technical points of view; analysis of selected works from Satie, Debussy, Ravel, Stravinsky, Bartok, Schoenberg, Berg, Webern, Cage, Babbitt, Badings, Carter, Ives, Stockausen, Messiaen, Xenakis, Varese, Henze and others.

MUS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

MUS 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

MUS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PHILOSOPHY

PHI 205 Introductory Logic (3)
Basic analysis of patterns of inference; examination of logical forms; development of elementary techniques for assessing validity of inferences.

PHI 221 Introduction to Philosophy (3)
Inquiry into the meaning and justification of fundamental ideas and beliefs concerning reality, knowledge, and values; application to relevant topics in ethics, religion, and politics.

PHI 305 Intermediate Logic (3)
PR: PHI 205. Systematic study of propositional and first-order predicate logic, logistic systems, and axiomatic methods. Problems of metatheory, including consistency, completeness, and decidability.
PHI 321 Greek and Roman Philosophy (3)
The emergence of enduring philosophical questions, critical thought, and metaphysical speculation from the pre-Socratics to Neoplatonism, with particular emphasis on Socrates, Plato and Aristotle.

PHI 323 Medieval and Renaissance Philosophy (3)
Survey of Scholasticism; the fusion of philosophy and religion; emergence of independence in philosophical thinking; naturalism and humanism; transition to the modern period. Consideration of such philosophers as Aquinas, Bacon, Hobbes.

PHI 325 Philosophy of the Enlightenment (3)
Development of rationalism and empiricism in the 17th and 18th centuries. Attention to major philosophers of the period, including Descartes, Locke, Hume, Kant.

PHI 327 Nineteenth-Century Philosophy (3)
Development of idealism, materialism, positivism and utilitarianism. Consideration of such philosophers as Hegel, Marx, Comte, Nietzsche, Mill.

PHI 329 Twentieth-Century Philosophy (3)
Development of pragmatism, logical positivism, linguistic analysis, phenomenology, existentialism, process philosophy. Major issues in contemporary philosophy.

PHI 429 Existentialism (3)
Study of existentialist analysis and criticism of the human situation as found in the writings of such philosophers as Kierkegaard, Nietzsche, Heidegger, Sartre, and Camus.

PHI 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYSICS

PHYS 103 Astronomy (4)
PR: Two years of high school mathematics. An elementary survey of the astronomical universe including pulsars and the application of space technology to observational astronomy. Appropriate for the Environmental Studies Program.

PHYS 107,108 College Physics (4,3)
PR: Two years of high school mathematics. A study of classical
mechanics, thermodynamics, electricity, magnetism, optics, and modern physics. Especially suited for students who desire to use physics to satisfy the science requirements of the Environmental Studies Program.

PHYS 189 College Physics Laboratory (1)
PR: PHYS 107. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 211,212,213 General Physics (4,3,3)
CR: MATH 221. An introductory course for students requiring a thorough study of the basic principles of physics. A study of classical mechanics, thermodynamics, electricity, magnetism, optics, and modern physics.

PHYS 227,228 Classical Mechanics (3,3)
PR: PHYS 213 or PHYS 108 or consent of instructor. A study of statics and dynamics of rigid bodies, planetary motion, and special relativity. Intended for prospective teachers of science in secondary schools and others desiring knowledge of mechanics.

PHYS 281 Scientific Instruments Laboratory (4)
PR: PHYS 107 or 103 or consent of instructor. A lecture-laboratory course in the fundamentals of mechanics, electrical circuitry, optics and nuclear physics as required in the application and operation of scientific instruments. Two, three hour classes per week.

PHYS 282,283 General Physics Laboratory (1,1)
PR: PHYS 211. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 287,288,289 Physical Measurements (3,3,3)
PR: PHYS 213 or 108 or consent of instructor. A laboratory oriented course that begins with basic electrical circuits and includes a study of vacuum tubes, semiconductors and other electronic devices such as rectifiers, amplifiers and oscillators. Experiments in Modern Physics are also included. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in circuits and electronics related to physical measurements.

PHYS 321,322,323 Mechanics (3,3,3)
PR: PHYS 213 and MATH 222 or consent of instructor. A study of mechanics including vectors, coordinate transformations, fundamental theorems of Newtonian mechanics, rigid body dynamics, small oscillations, Lagrangian mechanics, and special relativity.
PHYS 331,332,333 Electricity and Magnetism (3,3,3)
PR: PHYS 213, CR: MATH 321 or consent of instructor. An introduction to scalar and vector fields, electrostatics, electrodynamics, magnetism, Maxwell’s equations, radiation, waveguides, and physical optics.

PHYS 335,336 Electronics (3,3)
PR: PHYS 213 or consent of instructor. The study of basic D.C. and A.C. circuit theory, the properties of vacuum tubes, semiconductors, power supplies, vacuum triodes and transistors, amplification, oscillation, modulation, detection, and noise.

PHYS 341,342,343 Modern Physics (3,3,3)
PR: PHYS 213 and MATH 223 or consent of instructor. The study of black body radiation, the interaction of radiation and matter, atomic spectra, nuclear and high energy physics, particle accelerators, molecular, and solid state physics.

PHYS 344 Modern Physics for Engineers (3)
PR: ENGR 221 and MATH 331. Selected topics in atomic, nuclear, molecular, and solid state physics. A study of spectroscopy, x-rays, nuclear radiation, and cosmic rays.

PHYS 347,348 Concepts in Modern Physics (3,3)
PR: PHYS 213 or PHYS 108 or consent of instructor. A study of modern physics including atomic and molecular structure, Bohr model of the atom, special relativity, and solid state physics. Intended for prospective teachers of science in secondary schools and others desiring an introductory course in modern physics.

PHYS 351,352 Optics (3,3)
PR: PHYS 213 or consent of instructor. A study of refraction, interference, diffraction, optical instruments, dipole radiation, Kirchoff integral, scattering, polarization, and stimulated emission.

PHYS 354 Optics and Wave Motion for Engineers (3)
PR: ENGR 211 and MATH 321. Selected topics in optics, acoustics, and related wave phenomena. A study of reflection, refraction, interference, and diffraction.

PHYS 357,358 Wave Motion and Optics (3,3)
PR: PHYS 213 or PHYS 108 or consent of instructor. A lecture and laboratory study of ripple tank water waves, sound waves, microwaves, and optics. Topics in both geometrical and physical optics will be considered. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in wave phenomena.
PHYS 381 Physics Laboratory — Electronics (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work stressing electronic principles through the study of test equipment, power supplies, amplifiers, oscillators, and pulse circuits.

PHYS 382 Physics Laboratory — Electricity and Magnetism (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in basic electrical measurements, measurement of e/m, transmission lines, microwaves, and Zeeman effect.

PHYS 383 Physics Laboratory — Nuclear Physics (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in nuclear physics stressing nuclear radiation and the interaction of radiation with matter.

PHYS 384 Physics Laboratory — Optics and Wave Motion (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in basic optics and wave phenomena. Selected experiments in interference and diffraction of waves, polarized light, spectroscopy, microwaves, and optical pumping.

PHYS 385 Physics Laboratory — Modern and Solid State Physics (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in selected areas of modern and solid state physics. A study of electrical conductivity in solids, temperature dependence in semiconductors, Hall effect, and electron mobility.

PHYS 461 Solid State Physics (3)
PR: PHYS 343 or consent of instructor. Properties of solids, crystal binding, free electron model, band theory of solids, Fermi surface, and solid state applications.

PHYS 471,472 Quantum Mechanics (3,3)
PR: PHYS 343 or consent of instructor. A study of the postulates of quantum mechanics, the Schrodinger equation, and an introduction to the statistics of many particle systems.

PHYS 475 Statistical Physics (3)
PR: PHYS 343 or consent of instructor. An introduction to thermodynamics, statistical mechanics, and kinetic theory.

PHYS 491 Contemporary Physics (3)
PR: Consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. For prospective teachers of physics. (Same as EDSE 494)
PHYS

PHYS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYS 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYS 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

POLITICAL SCIENCE

PCL 201 American National Government (3)
A study of the dynamics of American national government including its structure, organization, powers, and procedures.

PCL 203 Principles of Political Science (3)
The scope of political science and its development as a field with emphasis on areas of concern; analysis of the major approaches to the study of politics; familiarization with recent developments in research and research techniques.

PCL 301 American State and Local Government (3)
PR: PCL 201, 203 or consent of instructor. Analysis of the organization and functions of state and local governments and of problems of policy formulation and execution, particularly as they relate to the federal system.

PCL 305 Political Parties and Processes (3)
PR: PCL 201, 203 or consent of instructor. Study of American politics with major emphasis upon the role, organization, functions, and processes of parties in the American political system.

PCL 308 The American Presidency (3)
PR: PCL 201, 203 or consent of instructor. Examination of the presidency as an institution and of the evolution in status, powers, administrative responsibilities, leadership and decision-making roles of the chief executive in the American political system.

PCL 310 Congress and the Legislative Process (3)
PR: PCL 201, 203 or consent of instructor. The nature, role, and
functions of the legislative process; the dynamics of executive-legislative relations and resultant problems.

PCL 321 International Relations (3)
PR: PCL 201, 203 or consent of instructor. Analysis of the fundamental principles and factors affecting interstate relations; the foreign policy decision-making processes of states; the role and problem of power; conflict and methods of resolution.

PCL 323 International Relations (3)
PR: PCL 201, 203 or consent of instructor. Application of the theory and fundamentals of international politics to contemporary world affairs with attention to the impact of twentieth century developments upon the international system and its actors.

PCL 341 Comparative European Politics (3)
PR: PCL 201, 203 or consent of instructor. An analytical and comparative study of the major governments of Europe and their impact upon the development of types of political systems.

PCL 343 Politics of Developing Areas (3)
PR: PCL 201, 203 or consent of instructor. An analysis of non-Western political systems with emphasis upon the problems of political, socio-economic, and cultural development as they affect attempts to achieve the transformation to modernization.

PCL 360 American Political Philosophy (3)
PR: PCL 201, 203 or consent of instructor. A survey of the chief contributions of American political thought, their sources and background as focused within the context of American historical and institutional development.

PCL 403 Political Behavior (3)
PR: PCL 201, 203 or consent of instructor. A study of the role and impact of group behavior and interest articulation in a pluralistic society and their effect upon the political process.

PCL 405 Political Theory (3)
PR: PCL 201, 203 or consent of instructor. Examination at an advanced level of various normative and empirical approaches to the study of political science, stressing contemporary developments in the field.

PCL 410 Public Administration (3)
PR: PCL 201, 203 or consent of instructor. Analysis of administrative theories and of the processes by which public policies are implemented in a democratic society.
PCL 413 Metropolitan Politics (3)
PR: PCL 201, 203 or consent of instructor. Analysis of political patterns, processes, and issues in American communities.

PCL 427 American Foreign Policy (3)
PR: PCL 201, 203 or consent of instructor. An analysis of the traditions and development of American foreign policy with major emphasis on the role and policies of the United States in the contemporary world.

PCL 430 International Organizations (3)
PR: PCL 201, 203 or consent of instructor. The nature and growth of international agencies of cooperation with attention focused upon the problems and development of functional, regional, and universal organizations.

PCL 433 International Law (3)
PR: PCL 201, 203 or consent of instructor. An introduction to the nature, evolution, and sources of international law and its role in interstate relations.

PCL 461 Political Philosophy (3)
PR: PCL 201, 203 or consent of instructor. Study of the development of political and social ideas in Western thought from early Greece to the Renaissance.

PCL 462 Political Philosophy (3)
PR: PCL 201, 203 or consent of instructor. Renaissance to the 19th Century.

PCL 463 Political Philosophy (3)
PR: PCL 201, 203 or consent of instructor. Study of contemporary Western political and social thought in the 19th and 20th Century.

PCL 471 American Constitutional Law (5)
PR: PCL 201, 203 or consent of instructor. The impact of judicial decision-making upon the growth of American political institutions and processes.

PCL 473 American Constitutional Law (5)
PR: PCL 201, 203 or consent of instructor. The role of the judiciary in the focusing and refinement of individual rights and civil liberties in American society.

PCL 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.
PCL 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PCL 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

PSYCHOLOGY

PSY 201, 202 General Psychology (3,3)
The basic principles, theories, and methods of contemporary psychology.

PSY 300 Applied Psychology (4)
Applications of principles of psychology to problems of human development, personal and social adjustment, career choice and satisfaction.

PSY 301 Basic Learning Processes (4)
PR: PSY 201, 202. A survey of theories and research findings from basic laboratory investigation of learning phenomena. Lec-lab.

PSY 302 Complex Human Learning (4)
PR: PSY 301. Selected topics from theories and research on complex human learning and problem solving. Lec-lab.

PSY 303 Physiological Psychology (4)

PSY 304 Perception (4)
PR: PSY 201, 202. Consideration of physical and psychological variables in perceptual phenomena. Lec-lab.

PSY 305 Psychological Measurement (4)
PR: PSY 201, 202, STAT 201. Theory of test construction and consideration of selected measures of psychological characteristics.

PSY 306 Psychology of Adjustment (4)
Psychological principles of adjustment, application of psychology to problems in living.

PSY 307 Motivation (4)
PSY 308 Social Psychology (4)
PR: PSY 201, 202. Effects of social situations and social variables on the behavior of individuals.

PSY 309 Personality Theory (4)

PSY 310 Abnormal Psychology (4)
PR: PSY 309. Classification, causation, and treatment of deviant patterns of behavior.

PSY 311 Methods of Psychological Research (3)
PR: PSY 201, 202. Critical evaluation of research methods in psychology, considerations of internal and external validity.

PSY 312 Clinical Psychology (4)
PR: PSY 310. Consideration of psychodiagnosics, behavioral modification techniques and clinical research. Lec-lab.

PSY 313 Developmental Psychology (4)
The effects of genetic, psychological, maturational, and social factors on behavior at various stages of development.

PSY 314 Industrial Psychology (4)
PR: PSY 201, 202, STAT 201. Psychological principles of employee selection, training, and morale.

PSY 401 Senior Research Proposal (2)
PR: STAT 401 and senior standing. Study in depth of bibliography and methods of psychological research. Each student will write, and have approved, a proposal for an original piece of research.

PSY 405 History and Systems of Psychology (4)
PR: PSY 301, 309. Historical development of psychology with emphasis on classical theoretical positions.

PSY 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

PSY 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PSY 499 Undergraduate Research (8)
PR: Consent of instructor.
RADIO/TELEVISION

RTV 140 Radio-Television I (3)
Nature of the media, the mechanics of operation, history, economics, programming, and internal and external controls.

RTV 240 Audio Production I (3)
Sound recording; acoustics; and music and effects, both live and recorded, for radio and television. (Laboratory hours to be arranged).

RTV 241 Television Production I (3)
Studio operation; available means of presentation: Studio, lights, sets, graphics, cameras, audio, switching, and tape recording. (Laboratory hours to be arranged).

RTV 340 Audio Production II (3)
PR: RTV 240 or consent of instructor. The production of music (live and recorded), talk, interview, discussion, sports, and documentary including performance (talent and announcing) and direction. (Laboratory hours to be arranged).

RTV 341 Television Production II (3)
PR: RTV 241 or consent of instructor. Emphasis on the coordination of talent, cameras, visuals, audio and lighting with the dramatic values of the presentation. (Laboratory hours to be arranged).

RTV 342 Broadcast Journalism I (3)
Examination of the historical, legal, and quasi-legal influences on broadcast news; introduction to news sources, writing, and interviewing techniques for radio-television news.

RTV 344 Broadcast Continuity and Programming I (3)
Practice in the preparation of written materials for all kinds of radio and television programs except news, documentary, and drama. Examination of program practices, development, and traffic systems.

RTV 345 Film for Television (3)
Principles and practices of 8mm and 16mm film usage within the television industry.

RTV 346 Radio, Television, and Society (3)
A study of the impact of electronic media upon the habits, customs, and thinking of our times. Considerations of internal media problems.
RTV 351 Radio Production and Directing (3)  
PR: RTV 340. Techniques and practice in producing and directing radio programs. (Laboratory hours to be arranged).

RTV 441 Television Production and Directing (3)  
PR: RTV 341. The planning, preparation and directing of programs with emphasis on dramatic values of composition, movement, position, action timing, pacing, climax, ascendant and descendant values; integration of the parts to the whole. (Laboratory hours to be arranged).

RTV 444 Broadcast Continuity and Programming II (3)  
PR: RTV 344 or consent of instructor. Preparation of documentaries and dramatic writing for radio and television.

RTV 445 Television Film Production (3)  
PR: Consent of instructor. Planning and preparation of filmed documentaries, public service and commercial productions. (Laboratory hours to be arranged).

RTV 448 Broadcast Regulations (3)  
PR: RTV 14Q or RTV 342. Federal, state, local and self-regulatory agencies and practices which govern electronic media.

RTV 450 Broadcast Journalism II (3)  
PR: JRN 321, for radio-television concentrates, RTV 342. Principles and practice of news preparation for electronic media. (Laboratory hours to be arranged).

RTV 451 Radio-Television Advertising (3)  
PR: Consent of instructor. Radio and television as advertising media; advertisers' demands and budgets; appropriate programs for the sponsors' needs; writing of commercial continuity.

RTV 452 Broadcast Criticism (3)  
Evaluation and criticism of past and present radio and television programs, policies and critics. Concentration on the problem of criteria development.

RTV 453 Educational Broadcasting (3)  
PR: Consent of instructor. The values and potentials of radio and television in education, with particular emphasis on current use of the media in elementary and secondary schools, colleges, and universities, and adult education.

RTV 454 Instructional Broadcasting (3)  
Learning theory applied to the creation, production and dissemination of
lessons via electronic media. Introduction to and practicum in radio and television studios as well as lesson presentation. (Laboratory hours to be arranged).

RTV 457 Broadcast Internship (12-15)
PR: RTV 240 and RTV 344 and consent of instructor. Practicum at a selected professional broadcast production center for one quarter. In addition to a regular prescribed work schedule, the intern must submit a weekly log of his activities and produce a significant research paper.

RTV 458 Broadcast Management (3)
PR: RTV 448. Consideration of broadcast management problems in station operations at the local, regional and national levels.

RTV 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

RTV 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

RELIGION

REL 301 Comparative Religions I (3)
The religions of China and Japan, their concepts, philosophy, and rituals.

REL 302 Comparative Religions II (3)
The religions of India and Southeast Asia.

REL 303 Comparative Religions III (3)
The religions of the Near East.

REL 321 Religion in America (3)
The effect of Puritan, Quaker, Anglican, and Catholic traditions on various regions; the phenomenon of evangelism; the rise of new sects such as Mormonism.

REL 441 Modern Theology (3)
An exploration of the revolution in religious thought based on the work of Kierkegaard, Jaspers, Heidegger, Tillich, Barth, Niebuhr, Bonhoeffer, Bultmann, Altizer, and Teilhard de Chardin.
RUSSIAN

RUS 101 Elementary Russian Language and Civilization (3)
Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to Russian culture.

RUS 102 Elementary Russian Language and Civilization (3)
PR: RUS 101 or equivalent. Continuation of RUS 101.

RUS 103 Elementary Russian Language and Civilization (3)
PR: RUS 102 or equivalent. Continuation of RUS 102.

RUS 201 Intermediate Russian Language and Civilization (3)
PR: RUS 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Russian culture.

RUS 202 Intermediate Russian Language and Civilization (3)
PR: RUS 201 or equivalent. Continuation of RUS 201.

RUS 203 Intermediate Russian Language and Civilization (3)
PR: RUS 202 or equivalent. Continuation of RUS 202 with greater emphasis on Russian civilization from the Middle Ages to the present.

RUS 301 Russian Composition (4)
PR: RUS 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled written compositions required.

RUS 303 Russian Conversation (4)
PR: RUS 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

SCIENCE

SCI 490 Senior Seminar: Science in Human Affairs (2)
The impact of science on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to students majoring in the College of Natural Sciences.
SOCIOLOGY

Introductory Sequence: SOC 201, 202.


Social Organization: SOC 325, 326, 333, 335, 407, 411, 416.


SOC 201, 202 General Sociology (3,3)
An introduction to the principles of sociology. Primary emphasis is given to the understanding and application of such concepts as human interaction, the nature of the group and group interrelationships, social and cultural systems, the individual as a reflection of his group associations.

SOC 304 The Development of Social Thought (5)
PR: SOC 201, 202. An overview of theories concerning the nature of man as a "social being" and of the nature of society, from the classical Greek-Roman period to the Second World War.

SOC 306 Modern Sociological Thought (5)

SOC 307 The Sociology of Religion (3)
Patterns in religious behavior in various societies with primary emphasis on myth, rite, taboo and festival as social phenomena.

SOC 321, 322 General Anthropology (3,3)
An introduction to the principles of anthropology. The nature of culture and of culturally derived norms of human behavior. The various aspects of anthropology, human pre-history, physical anthropology, culture and personality, anthropological linguistics.

SOC 325 Urban Sociology (5)
PR: SOC 201, 202. Historical roots of urbanization. Impact of city life on
social actions, social relationships, social institutions and the types of
civilizations derived from and based on urban modes of living.

SOC 326 Rural Sociology (3)
PR: SOC 201, 202. Rural American life, its resources, and the problems
of changing patterns of rural social structure.

SOC 331 Social Problems (3)
Major social problems created by the complex social situations of modern
life. Sociological analysis of such problem areas as crime and delinquency,
poverty, racial tensions, over-population, and drug addiction.

SOC 333 Industrial Sociology (5)
PR: SOC 201, 202. Application or development of principles of sociology
relevant to the industrial mode of production and the industrial way of
life.

SOC 335 Social Institutions (3)
Social institutions, social differentiation, and social control, with emphasis
on American and other modern societies.

SOC 340 Social Welfare: A Social Institution (5)
PR: SOC 201, 202. An introduction to social welfare as an institution.
The historical and philosophical development of social welfare as related
to current social welfare objectives and programs.

SOC 341 Social Work: Principles and Methods (3)
PR: SOC 340. A theoretical consideration of the concepts and methods of
social work practice and the values, activities and roles of social workers in
various practice settings.

SOC 342 Government and Social Welfare (3)
PR: SOC 340, 341. The role of federal, state, and local government in
social welfare. Laws, policy formulation, administration, and current issues
will be examined.

SOC 343 The Community and Social Welfare (3)
PR: SOC 340, 341. The community as a social system in meeting human
needs. Emphasis on private agencies, including their organization,
functions, interrelationships and coordination with governmental agencies.

SOC 345 Juvenile Delinquency (5)
PR: SOC 201, 202. Types of delinquent behavior found among juveniles,
possible causes and ways society attempts to treat the various forms of
delinquency.
SOC 346 Criminology (5)

SOC 348 Sociology of Alcoholism (3)
Introduction to the nature of alcoholism and review of its impact on society.

SOC 350 Sociology and the Supreme Court: A Focus for Social Change (3)
Sociological, economic and political forces giving rise to and resulting from decisions of the Supreme Court.

SOC 352 Intergroup Conflict and Prejudice (3)
PR: SOC 201, 202. Causes and consequences of group conflict, with emphasis upon majority-minority relations, prejudice and discrimination, alternative theories of prejudice, the effects of minority status on individuals and possibilities for attitude and behavior change.

SOC 353 Culture and Personality (3)
PR: SOC 201, 202. Theories of the variations in personality in relation to culture and group life in tribal and modern societies.

SOC 354 The Sociology of Adolescence (3)
PR: SOC 201, 202. An examination of the transition to adulthood in various societies with primary emphasis on initiation and the contemporary American problems centering around the "adolescent crisis."

SOC 407 The Family (5)
PR: SOC 201, 202. The study of the family as a social institution. The family through history, and the family cross-culturally. The modern American family as a distinct social and cultural complex. Changes in the family system. Courtship and marriage.

SOC 411 Demography (3)
PR: SOC 201, 202. Concerned with the study of human population, its distribution, composition and change.

SOC 412 Field Experience and Seminar (5)
PR: SOC 340, 341, 342, 343 and Senior Standing. Supervised learning experiences in local social agencies relating theory and academic preparation with practice. Eight hours per week plus two hour weekly seminar.
SOC 416 Human Ecology (3)
Principles governing the spatial distribution of human populations and activities within an area.

SOC 451 Contemporary Social Movements (3)
PR: SOC 201, 202, 231. Causes and effects of various social movements in American society compared to large-scale upheavals throughout the West. Considers various theories of explanation.

SOC 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

SOC 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

SOC 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

SPANISH

SPA 101 Elementary Spanish Language and Civilization (3)
Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to Spanish culture.

SPA 102 Elementary Spanish Language and Civilization (3)
PR: SPA 101 or equivalent. Continuation of SPA 101.

SPA 103 Elementary Spanish Language and Civilization (3)
PR: SPA 102 or equivalent. Continuation of SPA 102.

SPA 201 Intermediate Spanish Language and Civilization (3)
PR: SPA 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Spanish culture.

SPA 202 Intermediate Spanish Language and Civilization (3)
PR: SPA 201 or equivalent. Continuation of SPA 201.

SPA 203 Intermediate Spanish Language and Civilization (3)
PR: SPA 202 or equivalent. Continuation of SPA 202 with greater emphasis on Spanish civilization from the Middle Ages to the present.
SPA 301 Spanish Composition (4)  
PR: SPA 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax and development of style. Free and controlled written composition required.

SPA 303 Spanish Conversation (4)  
PR: SPA 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

SPA 311 Survey of Spanish Literature (3)  
PR: SPA 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance and Baroque.

SPA 312 Survey of Spanish Literature (3)  
PR: SPA 203 or equivalent. Main literary currents and works of the eighteenth and nineteenth centuries.

SPA 313 Survey of Spanish Literature (3)  
PR: SPA 203 or equivalent. Main literary currents and works from the Generation of 1898 to the present.

SPA 316 Survey of Latin-American Literature (3)  
PR: SPA 203 or equivalent. Main literary currents and works from the colonial period through the struggle for independence.

SPA 317 Survey of Latin-American Literature (3)  
PR: SPA 203 or equivalent. Main literary currents and works from the second half of the nineteenth century to the present.

SPA 401 Spanish Phonetics and Diction (2)  
PR: SPA 303 or equivalent. Spanish phonology with emphasis on phonic groupings.

SPA 421 Golden Age Drama (3)  

SPA 423 Cervantes (3)  
PR: SPA 311. Don Quixote.

SPA 441 Nineteenth-Century Spanish Literature (3)  
### SPA

**SPA 442 Nineteenth-Century Spanish Literature (3)**  
PR: SPA 312. The realistic and naturalistic novel in Spain.  

**SPA 443 The Generation of 1898 (3)**  
PR: SPA 313. A study of the Generation's main authors and their works.  

**SPA 451 Twentieth-Century Spanish Literature (3)**  
PR: SPA 313. The contemporary Spanish novel.  

**SPA 452 Twentieth-Century Spanish Literature (5)**  
PR: SPA 313. Contemporary Spanish drama and poetry.  

**SPA 497 Undergraduate Seminar (2-5)**  
PR: Consent of instructor. May be repeated for credit.  

**SPA 498 Independent Study (2-5)**  
PR: Consent of instructor. May be repeated for credit.  

### SPE

**SPE 101 Fundamentals of Oral Communication (3)**  
Use of the body and voice; participation in various speaking situations; planning, organizing, and delivering public speeches.  

**SPE 261 English Phonetics and American Dialects (3)**  
Physiological description and visual notation of speech sounds; regional dialects of American English.  

**SPE 262 Psychology of Oral Communication (3)**  
Psychological principles involved in the communicative process with application to individuals and groups.  

**SPE 360 Persuasion: Argumentation (3)**  
PR: SPE 101 or consent of instructor. Study and practice in the preparation and delivery of argumentative speeches emphasizing argument, evidence and organization.  

**SPE 361 Persuasion: Motivation (3)**  
PR: SPE 101 or consent of instructor. A study of motivational factors involved in persuasive speaking to secure belief and action.
SPE 362 Platform Speaking (3)
PR: SPE 101 or consent of instructor. Theory and method; training in selecting and organizing materials for various types of speeches; practice in thinking and speaking before an audience; contemporary speeches as examples.

SPE 363 Discussion (3)
Nature of discussion and conference, problem analysis, duties of the participants, function of leader, and participation in various group situations.

SPE 365 Parliamentary Procedure (2)
Principles and rules governing participation and leadership in the conduct of informal business meetings.

SPE 370 Directing Extracurricular Speech Activities (3)
Debate, extemporaneous speech and other speech events; selection and training of contestants; interschool and intramural speech activities.

SPE 371 Speech and Human Relations (3)
Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 460 Group Dynamics (3)
PR: SPE 363 or consent of instructor. A study of human behavioral problems in various conference and group situations.

SPE 461 Studies in Modern Oral Communication Theory (3)
Comparative study of the views of modern rhetorician and oral communication theorists.

SPE 462 Persuasion (3)
PR: SPE 360. Application of the theory of reasoned discourse. Emphasis on evidence, argument, and analysis; factors involving the change of audience attitudes, and their application in the speaking situation. Student speeches, reports and projects.

SPE 463 Studies in Listening (3)
Analysis of current trends, professional literature, and resource materials bearing upon the teaching of listening in the classroom. Practice in listening; preparing listening experiences; oral and written reports.

SPE 468 Survey of Rhetoric (3)
General Survey: Major rhetorical trends from the classical era to the present. Comparison of Aristotelian and non-Aristotelian rhetorics. Contributions of principal figures will be discussed.
SPE 470 History and Criticism of American Public Address (3)
Rhetorical criticism of speaking and writing of American statesmen that have had an influence on political, social, and economic milieu of their times.

SPE 471 History and Criticism of British Public Address (3)
Rhetorical criticism of speaking and writing of British statesmen that have had an influence on political, social, and economic milieu of their times.

SPE 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

SPE 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

STATISTICS

STAT 201 Principles of Statistics (4)
PR: Two years of high school mathematics or one course of college mathematics. A lecture-laboratory course designed to introduce the student to statistical concepts in modern society. An introduction to basic principles: frequency distributions, measures of location and dispersion, probability, probability distributions, statistical inference.

STAT 321 Business & Economic Statistics (4)
PR: ECON 203, MATH 115, and STAT 201. The use of statistical methods as scientific tools in the analysis of economic and business problems. Emphasis is placed on the collection, analysis, and interpretation of quantitative economic and business data. (Same as ECON 321).

STAT 332 Statistical Quality Control (3)
Statistical concepts and methods applied to the control of quality of manufactured products. (Same as IEMS 332).

STAT 335 Probability and Statistics for Engineers (3)
PR: MATH 321. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as ENGR 371.)

STAT 341,342,343 Mathematical Statistics (3,3,3)
PR: MATH 223. Sample space, probability axioms, distribution functions, sampling distributions, point and interval estimation, hypothesis testing,
multivariate normal, regression and correlation, linear models, analysis of variance, distribution-free methods, an introduction to stochastic processes.

**STAT 401,402 Statistical Methods (4,4)**
PR: One course in statistics or graduate standing. A lecture-laboratory course designed to introduce the student to the role of statistics in research; methods of analyzing data from experiments and surveys; statistical concepts and models; estimation; tests of hypotheses; regression and correlation; analysis of variance and covariance; an introduction to the principles of the statistical design of experiments and surveys.

**STAT 411 Experimental Design (3)**
PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; experimental unit technique; complete block designs; confounding in factorial experiments; incomplete block designs; response surface methodology.

**STAT 421 Survey Design (3)**
PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

**STAT 435 Probability for Engineers (3)**
PR: STAT 335. Combinatorial analysis, sample space, events, probability, discrete and continuous random variables, probability distributions with applications in engineering. (Same as IEMS 435).

**STAT 436 Statistics for Engineers (3)**
PR: STAT 335. Significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation with applications in engineering. (Same as IEMS 436).

**STAT 447,448 Probability Theory and Applications (3,3)**
PR: MATH 321. Axioms of probability, discrete and continuous random variables, characteristic functions, Markov chains, recurrent events, sequences of random variables, random walk, simple stochastic processes.

**STAT 496 Special Topics (2-5)**
PR: Consent of instructor. May be repeated for credit.

**STAT 497 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.
STAT

STAT 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

STAT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

THEATRE

THA 180 Study of Drama and Theatre (3)
Nature of drama and the theatre, and basic principles of play analysis.

THA 220,221,222 Theatre Practice I (1,1,1)
Introduction to stagecraft, lighting, properties, costume design. (Laboratory hours to be arranged and practical experience on technical crews as required).

THA 230 Interpretation I (3)
Analysis of thought; development of imagination; oral presentation of literary forms; individual problems in interpretive reading. (Recommended for students majoring in English and preparing to teach literature).

THA 283,284,285 Acting I (1,1,1)
Study and practical experience in problems of creating characterization, with emphasis on developing vocal and physical skill in acting.

THA 320,321,322 Theatre Practice II (1,1,1)
PR: THA 220, 221, Or 222. Practical experience in designing and operating technical aspects of dramatic productions. (Service on crews is required).

THA 330 Interpretation II (3)
PR: THA 230 or the equivalent and junior standing. Selecting and abridging literary material for platform use; preparation and presentation of program for special and general occasions.

THA 331 History of the Theatre: Classic and Renaissance (3)
Development of theatre art from the earliest times through the sixteenth century.
THA 332 History of the Theatre: Seventeenth to the Twentieth Century (3)
Development of theatre art from the beginning of the seventeenth century through the nineteenth century.

THA 333 History of the Theatre: Staging and Architecture (3)
Study of costume and staging from earliest times to the present.

THA 334 Techniques of the Motion Picture (3)
PR: Consent of instructor. An examination of the techniques of motion picture art: directing, acting, editing, tempo, rhythmics.

THA 380 Directing I (3)
Fundamental principles of play-directing; demonstrations of theory in group exercises. Each student is required to direct two short scenes for laboratory presentation and criticism. (Laboratory hours to be arranged, and work in departmental productions).

THA 381 Scene Design I (3)
Study and practice of scene design; perspective drawing, fundamentals of design, and techniques of scene painting. (Service on crews as required).

THA 382 Stage Lighting (3)
PR: Junior standing. Study of stage lighting techniques, practices, and equipment. (Service on light crew is required).

THA 421 Dramatic Theory (3)
PR: Consent of instructor. The theory and philosophy of the theatre; analysis of various types of plays, both modern and historical, from the point of view of their production on a stage.

THA 422 High-School Play Directing (3)
Introduction to the theory and practice of directing and producing, with particular emphasis upon methods practicable in high-school and junior-college play production.

THA 423 Contemporary Theatre and Drama (3)
Trends in theatrical production and dramatic literature in Italy, France, Germany, Russia, and the Scandinavian countries.

THA 424 An Aesthetic of the Motion Picture (3)
PR: THA 334 of COM 310 or RTV 345, or consent of instructor. An aesthetic consideration of the motion picture as art; critical criteria and stylistic comparisons will be established through viewing of films, reading assignments, and discussion.
THA 425 Dramatic Criticism (3)
PR: Consent of instructor. Analysis of the nature of past and present day criticism of the drama; practical work in such criticism.

THA 480 Directing II (3)
PR: THA 380. Further theories and techniques of play direction, study of dramatic values, plot structure, style, mood, composition, and directing approach. Each student will direct scenes in class and laboratory and serve as assistant director or stage manager on a major production.

THA 481 Acting II (3)
PR: THA 283, 284, or 285. Study and practical experience in creating roles in plays of different types, style, and period, with emphasis on developing flexibility of actor’s equipment. (Laboratory hours to be arranged and work in departmental productions).

THA 483 Advanced Scene Design (3)
A continuation of THA 381 in which the emphasis is placed on independent planning and execution of a scene design. The student will be expected to work with the production group on a selected production.

THA 486 American Theatre and Drama: Eighteenth and Nineteenth Centuries (3)
An examination of the social, cultural and economic influences on the American drama and theatre. Trends in theatrical production and dramatic types, Revolutionary Drama, Social Comedy, Romantic verse Drama, ethnic characters, and Naturalism.

THA 487 American Theatre: Twentieth Century (3)
A continuation of THA 486, with emphasis placed upon the aesthetic and literary development of the theatre in this century. The New Stagecraft, Agitprop Theatre, Federal Theatre, Anti-war drama, the Absurdist and the avant-garde theatres will be dealt with in detail.

THA 488 Creative Dramatics and Children’s Theatre (3)
An introduction to the aesthetical and psychological bases of theatre production for and by young people. The production of children’s theatre, play selection, scenery, costumes, management, and touring.

THA 489 Studies in Oral Interpretation (3)
PR: THA 230. Individual oral reading projects; an intensive study of the literature for interpretation.

THA 496 Special Topics (2-5)
PR: Consent of Instructor. May be repeated for credit.
THA 498 Independent Study (2-5)
PR: Consent of Instructor. May be repeated for credit.

TRANSPORTATION

TRAN 301 Principles of Transportation (5)
PR: ECON 203. The economic characteristics, organization, and services of the different modes of transportation.

TRAN 401 Transportation Pricing and Policy (3)
PR: ACCY 103 and TRAN 301. An analysis of transportation costs, financing, rate making, and governmental regulation.

TRAN 411 Transportation Planning (3)
PR: TRAN 401. An analysis of the major problems of the American transportation system and an examination of policies for the development of an efficient transportation system.

TRAN 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOLOGY

ZOOL 100 General Zoology (3)
PR: BIOL 100. Introduction to zoology; structure, function, representative groups; current concepts in zoological sciences.

ZOOL 101 General Zoology Laboratory (1)
Laboratory exercises illustrating basic principles in zoology; taken concurrently with ZOOL 100.

ZOOL 220,221 Comparative Vertebrate Anatomy (3,3)
PR: ZOOL 100. The vertebrate animals; relationship of organs and systems; and their phylogenetic significance.

ZOOL 234 Anatomy and Physiology (5)
PR: ZOOL 100. The structure and function of the human body.

ZOOL 240 Invertebrate Zoology (5)
PR: ZOOL 100. Taxonomy, anatomy, and ecology of the invertebrate animals.
ZOOL 310 Histological Technique (4)
PR: ZOOL 100 or consent of instructor. Preparation of tissues for microscopic study; paraffin and cryostat methods; use of microtome; staining procedures; whole mounts.

ZOOL 320 Comparative Vertebrate Embryology (5)
PR: ZOOL 100 and preferably ZOOL 220-221. Embryology of the vertebrates; fertilization of egg; stages of cleavage; development of organs and systems.

ZOOL 322 Vertebrate Histology (4)
PR: ZOOL 100. Anatomy, structure and function of major cell types and tissues.

ZOOL 330 Animal Physiology (5)
PR: ZOOL 100 and junior standing. Function and interrelationships of nervous, endocrine, muscle, reticulo-endothelial, reproductive, excretory, respiratory, and digestive systems; immunology, serology.

ZOOL 340 Taxonomy of the Vertebrates (4)
PR: ZOOL 100. A survey of the common elements of the vertebrate fauna suitable for non-biologists and potential teachers.

ZOOL 345 General Entomology (4)
PR: ZOOL 100. Introduction to insects; their identification, biology and ecology.

ZOOL 350 Animal Ecology (4)
PR: ZOOL 100 and 11 hours in the biological sciences. Effects of environmental factors on various vertebrate and invertebrate groups.

ZOOL 355 Game Conservation and Management (3)
PR: ZOOL 100. Principles of conservation and management; habitat improvement; wildlife techniques; public relations.

ZOOL 370 Animal Parasitology (5)
PR: ZOOL 100. Identification and life histories of representative parasitic protozoa and helminths emphasizing host-parasite relationships; techniques of animal examination; emphasis on human parasites.

ZOOL 400,401 Advanced Animal Biology (2,2)
PR: ZOOL 100 and junior standing. Selected topics in animal biology; modern zoological theory and principles; recent research.
ZOOL

ZOOL 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

COURSE ADDITIONS

COED 100 Cooperative Education, Freshman Year (0)*

COED 200 Cooperative Education, Sophomore Year (0)*

COED 300 Cooperative Education, Junior Year (0)*

COED 400 Cooperative Education, Senior Year (0)*

EDPE 321 Exercise Physiology - Cardiovascular (5)

JRN 422 Public Affairs Reporting (3)
PR: JRN 420 or permission of instructor. Study of community news sources, reporting courts, city and county government.

*May be repeated.
MILLICAN, CHARLES N. (1965), B.S., M.A., Ph.D. (University of Florida)—President of the University and Professor of Finance
ABBOTT, DAVID W. (1968), B.A., M.S., Ph.D. (University of Massachusetts)—Chairman, Department of Psychology and Associate Professor of Psychology
ADICKS, RICHARD R., JR. (1968), B.A.E., M.A., Ph.D. (Tulane University)—Assistant Professor of English
ALLEN, GEORGE E. (1968), B.S., M.A., Ph.D. (Mississippi State University)—Chairman, Department of Biological Sciences and Associate Professor of Biological Sciences
ALLEN, WILLIAM D. (1969), A.A., B.Sc., M.S.W., Ph.D. (Ohio State University)—Professor of Sociology
ANDERSON, B. BETTY (1968), A.A., B.A., M.A., Ed.D. (University of Maryland)—Assistant Professor of Education
ARMSTRONG, LEE H. (1968), A.A., B.A., M.S. (Florida State University)—Assistant Professor of Mathematical Sciences
ARNOLD, ROBERT L. (1968), B.A., M.A., Ph.D. (Ohio University)—Associate Professor of Communications
ASBURY, LEONE J. (1969), B.S. (University of Tampa)—Instructor of General Studies
BAKER, GRAEME L. (1968), B.S., M.S., Ph.D. (Montana State University)—Chairman, Department of Chemistry and Professor of Chemistry
BARNES, BETH W. (1968), B.A., M.A. (University of South Florida)—Instructor of English
BARR, MURRAY P. (1968), B.S., M.S. (Adelphi University)—Assistant Professor of Mathematical Sciences
BEADLE, JAMES S. (1968), B.S., A.M., Ph.D. (Michigan State University)—Associate Professor of Education and Resident Professor, Cocoa Beach Continuing Education Center
BLEDSOE, ROBERT L. (1968), A.B., M.A. (University of Florida)—Assistant Professor of Political Science
BLOCK, DAVID L. (1968), B.S., M.S., Ph.D. (Virginia Polytechnic Institute)—Assistant Dean, College of Engineering and Assistant Professor of Engineering
BOLEMON, JAY S. (1968), B.S., Ph.D. (University of South Carolina)—Assistant Professor of Physics
BOLTE, JOHN R. (1968), B.A., M.A., M.S., Ph.D. (State University of Iowa)—Assistant Dean for Academic Affairs and Professor of Physics
BRACKNEY, ROSS C. (1968), A.B., M.A., Ph.D. (Stanford University)—Assistant Professor of English
BRENNAN, JOHN J. (1968), B.S., M.S., Ph.D. (Georgia Institute of Technology)—Assistant Professor of Physics
BROPHY, JAMES C. (1969), B.A., Ph.D. (Vanderbilt University)—Assistant Professor of Psychology
BROWNE, ROLAND A. (1968), B.A., M.A., C.E.F. (Queen’s University, Canada)—Assistant Professor of English
BRUMBAUGH, DOUGLAS K. (1969), B.S., M.Ed., Ed.D. (University of Georgia)—Assistant Professor of Education
BUDINA, JOHN W., JR. (1968), A.B., M.B.A., Ph.D. (St. Louis University)—Associate Professor of Finance
BURROUGHS, WAYNE A. (1969), B.A., M.A., Ph.D. (University of Tennessee)—Assistant Professor of Psychology
CAPEHART, BARNEY L. (1969), B.S.E.E., M.E., Ph.D. (University of Oklahoma)—FTU Assistant Professor of Engineering Courtesy Appointment; University of Florida Assistant Professor of Industrial and Systems Engineering, GENESYS—Orlando

CERVONE, ANTHONY V. (1968), B.A., Ph.D. (St. Louis University)—Chairman, Department of Foreign Languages and Associate Professor of Foreign Languages

CHARBA, JUlius P. (1969), B.S., M.S., Ph.D. (Washington State University)—Assistant Professor of Biological Sciences

CHESNUT, THOMAS L. (1969), B.S., M.S., Ph.D. (Mississippi State University)—Assistant Professor of Biological Sciences

CLAPP, DAVID E. (1969), B.S.C.E., M.S.E. (Arizona State University)—Assistant Professor of Engineering

CLARK, EUGENE A. (1969), Ph.B. (Marquette University)—Instructor of Education and Head Basketball Coach

CLAUSEN, CHRIS A., III (1969), B.S., Ph.D. (Louisiana State University)—Assistant Professor of Chemistry

CLELAND, TROY S. (1969), B.S., M.S., Ph.D. (Florida State University)—Assistant Professor of Education

COMBS, HOMER C. (1968), A.B., M.A., Ph.D. (Northwestern University)—Chairman, Department of English and Professor of English

COMISH, NEWEL W. (1968), B.S., M.S., Ph.D. (The Ohio State University)—Acting Chairman, Department of Business Administration and Professor of Business Administration

COWGILL, ROBERT G. (1969), B.S., M.A., Ph.D. (Indiana State University)—Associate Professor of Education

CUNNINGHAM, GLENN N. (1969), B.S., M.S., Ph.D. (North Carolina State University)—Assistant Professor of Chemistry

D’AUGUSTINE, CHARLES H. (1968), B.S., M.A., Ph.D. (Florida State University)—Associate Professor of Education

DOERING, ROBERT D. (1969), B.E.M.E., M.S.C.E., M.S.I.E., Ph.D. (University of Southern California)—Associate Professor of Engineering

DUTTON, ARTHUR M. (1968), B.S., Ph.D. (Iowa State University)—Chairman, Department of Mathematical Sciences and Professor of Mathematical Sciences

EHRRHART, LLEWELLYN M. (1969), A.B. (Franklin and Marshall College)—Assistant Professor of Biological Sciences

ELLIS, LESLIE L. (1968), B.S., M.S., Ph.D. (University of Oklahoma)—Director of Research and Graduate Studies and Professor of Biological Sciences

ERICKSON, ERNEST E. (1969), B.E.E., M.S.E., Ph.D. (University of Florida)—Associate Professor of Engineering

ESLER, WILLIAM K. (1968), B.A.Ed., M.A.Ed., Ph.D. (Kent State University)—Assistant Professor of Education

EVANS, RONALD D. (1968), B.S., M.N.S., M.S., Ph.D. (Arizona State University)—Chairman, Department of Mechanical Engineering and Aerospace Sciences and Associate Professor of Engineering

EYFELLS, JOHANN K. (1969), B.Arch., M.F.A. (University of Florida)—Assistant Professor of Art

FALCONER, DAVID R. (1969), B.A., M.S., Ph.D. (University of Texas)—Associate Professor of Mathematical Sciences

FLICK, ROBERT G. (1968), B.S., M.A., Ph.D. (University of Florida)—Chairman, Department of Humanities and Professor of Humanities

FRIDAY, RICHARD (1969), B.S., M.S. (Cornell University)—Instructor of Economics

GAMBRELL, CARROLL B., JR. (1967), B.S., M.S.E., Ph.D. (Purdue University)—Vice President for Academic Affairs and Professor of Engineering
GEMMELL, JAMES (1969), B.S., M.S., Ed.D. (New York University) — Visiting Professor of Education
GENNARO, ROBERT N. (1969), B.S., M.S. (New Mexico State University) — Assistant Professor of Biological Sciences
GERBER, HOMER C. (1968), B.S., M.A. (University of Illinois) — Assistant Professor of Mathematical Sciences
GILLILAND, CHARLES E., JR. (1969), B.S., M.S.B.A., Ph.D. (Washington University) — Dean, College of Business Administration and Professor of Business Administration
GRASY, WILLIAM K. (1968), B.S., M.A., Ph.D. (University of Texas) — Assistant Professor of Communications
GREEN, HAROLD E. (1968), A.A., B.S., M.Ed., Ed.D. (University of Missouri) — Associate Professor of Education and Resident Professor, Daytona Beach Continuing Education Center
GREENHAW, THOMAS D. (1969), A.B., M.A. (Stetson University) — Instructor of History
GROVE, RICHARD S. (1969), A.B., M.A., Ph.D. (University of Missouri) — Assistant Professor of English
HARDEN, RICHARD C. (1968), B.M.E., B.E.E., M.S.E., Ph.D. (University of Florida) — FTU Professor of Engineering Courtesy Appointment; University of Florida Resident Director and Professor of Electrical Engineering, GENESYS — Orlando
HARTMAN, J. PAUL (1968), B.S., B.S.C.E., S.M. (Harvard University) — Assistant Professor of Engineering
HARTMAN, ROBERT F., JR. (1969), B.S., M.B.A. (University of Pennsylvania), C.P.A. (Pennsylvania) — Associate Professor of Business Administration
HEINZER, MARTIN N. (1969), B.S., M.S., Ph.D. (Florida State University) — Assistant Professor of Mathematical Sciences
HENDERSON, BILLY J. (1968), B.S., M.S., Ph.D. (University of Georgia) — Assistant Professor of Physics
HERNANDEZ, DAVID E. (1968), B.S., M.S., Ed.D. (Florida State University) — Associate Professor of Education
HERTEL, GEORGE R. (1968), B.S., M.S., Ph.D. (Johns Hopkins University) — Assistant Professor of Chemistry
HICKS, ROBERT E. (1968), B.S., M.A., Ph.D. (The Ohio State University) — Assistant Professor of Economics
HILLS, HAROLD G. (1969), B.A., M.S., Ph.D. (University of Miami) — Assistant Professor of Biological Sciences
HITT, FRANKLIN J. (1969), B.S., M.B.A. (The Ohio State University) — Assistant Dean, College of Business Administration and Assistant Professor of Business Administration
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Dear Sir:

Please send an application for admission to:

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Date: ________________________________________________
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*Colleges are identified by the following abbreviations in this index:

Bus. Business Administration
Educ. Education
Engr. Engineering
Hum. Humanities & Social Sciences
N. S. Natural Sciences