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.

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

ACCENT ON THE INDIVIDUAL and ON EXCELLENCE

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE OF FLORIDA BOARD OF EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td>STATE OF FLORIDA BOARD OF REGENTS</td>
<td>3</td>
</tr>
<tr>
<td>ADMINISTRATION</td>
<td>4</td>
</tr>
<tr>
<td>WHERE TO GO FOR ANSWERS</td>
<td>6</td>
</tr>
<tr>
<td>CAMPUS AND VICINITY MAP</td>
<td>8</td>
</tr>
<tr>
<td>ACADEMIC CALENDAR</td>
<td>9</td>
</tr>
<tr>
<td>STATEMENT OF PURPOSE AND PHILOSOPHY</td>
<td>19</td>
</tr>
<tr>
<td>MASTER PLAN FOR CAMPUS</td>
<td>20</td>
</tr>
<tr>
<td>EAST CENTRAL FLORIDA AREA</td>
<td>21</td>
</tr>
<tr>
<td>ACCREDITATION</td>
<td>22</td>
</tr>
<tr>
<td>FTU FOUNDATION</td>
<td>22</td>
</tr>
<tr>
<td>STUDENT AFFAIRS</td>
<td>24</td>
</tr>
<tr>
<td>SCHEDULE OF FEES</td>
<td>31</td>
</tr>
<tr>
<td>ADMINISTRATIVE AND ACADEMIC POLICIES</td>
<td>33</td>
</tr>
<tr>
<td>GRADUATE STUDIES</td>
<td>47</td>
</tr>
<tr>
<td>ACADEMIC PROGRAMS</td>
<td>49</td>
</tr>
<tr>
<td>MAJOR IN GENERAL STUDIES</td>
<td>51</td>
</tr>
<tr>
<td>COLLEGE OF BUSINESS ADMINISTRATION</td>
<td>53</td>
</tr>
<tr>
<td>COLLEGE OF EDUCATION</td>
<td>62</td>
</tr>
<tr>
<td>COLLEGE OF ENGINEERING</td>
<td>75</td>
</tr>
<tr>
<td>COLLEGE OF HUMANITIES AND FINE ARTS</td>
<td>86</td>
</tr>
<tr>
<td>COLLEGE OF NATURAL SCIENCES</td>
<td>94</td>
</tr>
<tr>
<td>COLLEGE OF SOCIAL SCIENCES</td>
<td>109</td>
</tr>
<tr>
<td>CONTINUING EDUCATION</td>
<td>36, 119</td>
</tr>
<tr>
<td>COOPERATIVE EDUCATION</td>
<td>119</td>
</tr>
<tr>
<td>COURSE DESCRIPTIONS</td>
<td>120</td>
</tr>
<tr>
<td>FACULTY</td>
<td>207</td>
</tr>
<tr>
<td>INDEX</td>
<td>222</td>
</tr>
</tbody>
</table>
STATE OF FLORIDA
BOARD OF EDUCATION

Reubin O'D. Askew, Governor
Floyd T. Christian, Commissioner of Education
Robert L. Shevin, Attorney General
Thomas D. O'Malley, State Treasurer
Richard B. Stone, Secretary of State
Fred O. Dickinson, Comptroller
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STATE OF FLORIDA
BOARD OF REGENTS

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Edward W. Stoner, M.D., Director of Student Health Service
David A. Tucker, Ph.D., Director of Development Center
Carol P. Wilson, M.B.A., Acting Dean of Women
<table>
<thead>
<tr>
<th>Questions regarding</th>
<th>Who to see</th>
<th>Where*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Matters</td>
<td>Academic Adviser</td>
<td>AD 165</td>
</tr>
<tr>
<td>Academic Status</td>
<td>Registrar</td>
<td>AD 165</td>
</tr>
<tr>
<td>Admission, Graduate or Undergraduate</td>
<td>Admissions Office</td>
<td>AD 165</td>
</tr>
<tr>
<td>Add, Drop, or Change Courses</td>
<td>Registrar</td>
<td>AD 165</td>
</tr>
<tr>
<td>Books, Supplies, and Sundry Items</td>
<td>Bookstore</td>
<td>LR B-3</td>
</tr>
<tr>
<td>Cashing a Check</td>
<td>Cashier</td>
<td>AD 159</td>
</tr>
<tr>
<td>Checking out Books</td>
<td>Library</td>
<td>LR 1st Floor</td>
</tr>
<tr>
<td>Checking out Phonograph Records</td>
<td>Library</td>
<td>LR 4th Floor</td>
</tr>
<tr>
<td>Continuing Education Courses (Off Campus)</td>
<td>Continuing Education</td>
<td>AD 374</td>
</tr>
<tr>
<td>Cooperative Education</td>
<td>Cooperative Education</td>
<td>AD 384</td>
</tr>
<tr>
<td>Credit by Examination</td>
<td>Dean of Appropriate College</td>
<td>AD 374</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Director of Graduate Studies or</td>
<td>AD 397</td>
</tr>
<tr>
<td></td>
<td>Dean of Appropriate College</td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td>Student Health Service</td>
<td>VC</td>
</tr>
<tr>
<td>Graduation:</td>
<td>Registrar</td>
<td>AD 165</td>
</tr>
<tr>
<td>Application</td>
<td>Cashier</td>
<td>AD 159</td>
</tr>
<tr>
<td>Fees</td>
<td>Bookstore</td>
<td>LR B-3</td>
</tr>
<tr>
<td>Cap &amp; Gown</td>
<td>Placement Office</td>
<td>AD 225</td>
</tr>
<tr>
<td>Positions</td>
<td>Student Adviser</td>
<td>AD 374</td>
</tr>
<tr>
<td>Course Checkout</td>
<td>Developmental Center</td>
<td>Dorm C</td>
</tr>
<tr>
<td>Help with Reading, Speech, and Hearing</td>
<td>Registrar</td>
<td>AD 165</td>
</tr>
<tr>
<td>Identification Cards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior College Relations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Intramurals</td>
<td>Student Affairs</td>
<td></td>
</tr>
<tr>
<td>Loans, Scholarships, and Grants</td>
<td>Student Financial Aid</td>
<td></td>
</tr>
<tr>
<td>Lost and Found</td>
<td>Village Center</td>
<td></td>
</tr>
<tr>
<td>Organizing a Club</td>
<td>Student Affairs (Mr. Ferrell)</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>Student Affairs</td>
<td></td>
</tr>
<tr>
<td>Paying University Bills</td>
<td>Cashier</td>
<td></td>
</tr>
<tr>
<td>Personal Counseling</td>
<td>Developmental Center</td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td>Placement Office</td>
<td></td>
</tr>
<tr>
<td>Readmission following Withdrawal, Disqualification, or Exclusion</td>
<td>Admissions Office</td>
<td></td>
</tr>
<tr>
<td>Records and Transcripts</td>
<td>Registrar</td>
<td></td>
</tr>
<tr>
<td>Securing Redress of a Grievance</td>
<td>Student Affairs</td>
<td></td>
</tr>
<tr>
<td>Student Employment</td>
<td>Student Financial Aid Office</td>
<td></td>
</tr>
<tr>
<td>Test Scores (Admissions)</td>
<td>Academic Adviser or Developmental Center</td>
<td></td>
</tr>
<tr>
<td>Tickets</td>
<td>Village Center</td>
<td></td>
</tr>
<tr>
<td>Traffic Violations</td>
<td>Campus Security Office</td>
<td></td>
</tr>
<tr>
<td>Vehicle Registration</td>
<td>Campus Security Office</td>
<td></td>
</tr>
<tr>
<td>Vocational Counseling</td>
<td>Developmental Center</td>
<td></td>
</tr>
<tr>
<td>Withdrawing from a Course or from the University</td>
<td>Registrar</td>
<td></td>
</tr>
<tr>
<td>CANNOT FIND AN ANSWER?</td>
<td>Information Booth</td>
<td></td>
</tr>
</tbody>
</table>

*AD — Administration Building
LR — Library Building
VC — Village Center
LOCATION OF INSTITUTIONS IN THE STATE UNIVERSITY SYSTEM
University of West Florida - Pensacola
Florida A and M University - Tallahassee
Florida State University - Tallahassee
University of North Florida - Jacksonville
University of Florida - Gainesville
University of South Florida - Tampa
Florida Technological University - Orlando
Florida Atlantic University - Boca Raton
Florida International University - Miami
ACADEMIC CALENDAR

spring quarter 1972

MARCH 6 (MON.) LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO SPRING QUARTER.

MARCH 17 (FRI.) LAST DAY FOR RECEIPT OF APPLICATIONS FOR READMISSION TO SPRING QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO SPRING QUARTER.

MARCH 21 (TUES.) ORIENTATION AND ADVISEMENT FOR NEW FRESHMEN, TRANSFERS, AND ADVISEMENT FOR FORMER AND CURRENT STUDENTS NOT PRE-ADVISED.

MARCH 22, 6:00 - 8:00 pm (WED.) REGISTRATION BY APPOINTMENT FOR GRADUATE STUDENTS.

MARCH 23, 9:30 am - 7:30 pm (THURS.) REGISTRATION BY APPOINTMENT FOR CURRENT UNDERGRADUATE STUDENTS.

MARCH 24, 9:30 - 10:00 am (FRI.) REGISTRATION FOR ANY ELIGIBLE CURRENT UNDERGRADUATE STUDENTS NOT REGISTERED.

MARCH 24, 10:00 - 10:30 am (FRI.) REGISTRATION FOR FORMER UNDERGRADUATE STUDENTS BY APPOINTMENT.

MARCH 24, 10:30 am - 1:00 pm (FRI.) REGISTRATION BY APPOINTMENT FOR NEW UNDERGRADUATE STUDENTS.

MARCH 27, 8:00 am (MON.) CLASSES BEGIN FOR SPRING QUARTER.

MARCH 29, 4:00 - 6:00 pm (WED.) LATE REGISTRATION (FOR TEMPORARY STUDENTS). ALL STUDENTS WILL BE ASSESSED A LATE FEE: $25.00 FOR FULL TIME STUDENTS, $10.00 FOR PART TIME STUDENTS.

MARCH 29, UNTIL 3:00 pm (WED.) LAST DAY TO ADJUST CLASS SCHEDULE (END OF ADD-DROP PERIOD).

MARCH 31 (FRI.) SPRING HOLIDAY. (STUDENTS)

APRIL 3, 8:00 am (MON.) CLASSES RESUME.

APRIL 4 (TUES.) LAST DAY TO MAKE APPLICATION FOR GRADUATION FOR STUDENTS WHO WILL COMPLETE REQUIREMENTS AT END OF SPRING QUARTER.

APRIL 22 (SAT.) GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.
APRIL 24 (MON.)  DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

MAY 24 (WED.)   LAST DAY TO WITHDRAW FROM A COURSE OR FROM THE UNIVERSITY.
                 LAST DAY TO CHANGE FROM CREDIT TO AUDIT, IF PASSING.

MAY 22-26 (MON.-FRI.)   EDUCATIONAL COUNSELING AND STUDENT ADVISEMENT FOR THE SUMMER AND FALL QUARTERS.

MAY 29 (MON.)   MEMORIAL DAY HOLIDAY (UNDER THE 1968 UNIFORM MONDAY HOLIDAY ACT).

MAY 30, 8:00 am (TUES.)   CLASSES RESUME.

JUNE 2, 9:30 pm (FRI.)    CLASSES END FOR SPRING QUARTER.

JUNE 5-8 (MON.-THURS.)   FINAL EXAMINATION PERIOD.

JUNE 9, 12 noon (FRI.)    GRADES DUE IN REGISTRAR’S OFFICE.

JUNE 9 (FRI.)    COMMENCEMENT.

ACADEMIC YEAR ENDS.

summer quarter 1972

MAY 16 (TUES.)   LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO SUMMER QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO SUMMER QUARTER.

MAY 16 (TUES.)   LAST DAY FOR RECEIPT OF APPLICATIONS FOR READMISSION TO SUMMER QUARTER.

JUNE 12 (MON.)   ORIENTATION AND ADVISEMENT FOR NEW FRESHMEN, TRANSFERS, AND ADVISEMENT FOR FORMER AND CURRENT STUDENTS NOT PRE-ADVISED.

JUNE 13, BEGINS 6:00 pm (TUES.)   REGISTRATION BY APPOINTMENT FOR GRADUATE CREDIT STUDENTS.

JUNE 14, BEGINS 9:30 am (WED.)   REGISTRATION BY APPOINTMENT FOR CURRENT UNDERGRADUATE STUDENTS.

JUNE 14, 3:00 pm - 3:30 pm (WED.)   REGISTRATION BY APPOINTMENT OF FORMER UNDERGRADUATE STUDENTS.
JUNE 14, BEGINS 3:30 pm (WED.)

REGISTRATION BY PRIORITY NUMBER FOR NEW FRESHMEN AND TRANSFER STUDENTS.

JUNE 17 (SAT.)

GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

JUNE 15, 8:00 am (THURS.)

CLASSES BEGIN FOR SUMMER QUARTER.

JUNE 19, BEGINS 4:00 pm (MON.)

LATE REGISTRATION (FOR TEMPORARY STUDENTS). ALL STUDENTS WILL BE ASSESSED A LATE FEE: $25.00 FOR FULL TIME STUDENTS, $10.00 FOR PART TIME STUDENTS.

JUNE 19 (MON.)

LAST DAY TO ADJUST CLASS SCHEDULE (END OF ADD-DROP PERIOD).

JUNE 19 (MON.)

LAST DAY TO MAKE APPLICATION FOR GRADUATION FOR STUDENTS WHO WILL COMPLETE REQUIREMENTS AT END OF SUMMER QUARTER.

JULY 4 (TUES.)

INDEPENDENCE DAY HOLIDAY. (UNIVERSITY-WIDE)

JULY 5, 8:00 am (WED.)

CLASSES RESUME.

JULY 12 (WED.)

DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

AUGUST 4 (FRI.,)

LAST DAY TO WITHDRAW FROM A COURSE OR FROM THE UNIVERSITY. LAST DAY TO CHANGE FROM CREDIT TO AUDIT, IF PASSING.

AUGUST 7-11 (MON.-FRI.)

EDUCATIONAL COUNSELING AND STUDENT ADVISEMENT FOR FALL QUARTER.

AUGUST 18 (FRI.)

CLASSES END FOR SUMMER QUARTER. FINAL EXAMINATIONS GIVEN AT THE DISCRETION OF THE INSTRUCTOR. SPECIAL GRADUATION CEREMONY.

AUGUST 21, 12 noon (MON.)

GRADES DUE IN REGISTRAR'S OFFICE.

fall quarter 1972

AUGUST 21 (MON.)

LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO FALL QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO FALL QUARTER.

LAST DAY FOR RECEIPT OF APPLICATIONS FOR READMISSION TO FALL QUARTER.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEP. 5</td>
<td>Academic Year Begins.</td>
</tr>
<tr>
<td>SEP. 5-8 &amp; 11</td>
<td>Orientation and advisement for new freshmen and transfer students not pre- advised.</td>
</tr>
<tr>
<td>SEP. 11-12</td>
<td>Advisement of current and former students not pre- advised.</td>
</tr>
<tr>
<td>SEP. 12</td>
<td>Registration by appointment for graduate students.</td>
</tr>
<tr>
<td>SEP. 13</td>
<td>Registration by appointment for current undergraduate students.</td>
</tr>
<tr>
<td>SEP. 14</td>
<td>Registration by appointment for former undergraduate students.</td>
</tr>
<tr>
<td>SEP. 14</td>
<td>Registration by appointment for new full-time undergraduate students.</td>
</tr>
<tr>
<td>SEP. 14</td>
<td>Registration by appointment for new part-time undergraduate students.</td>
</tr>
<tr>
<td>SEP. 15</td>
<td>Registration by appointment for new full-time undergraduate students and other students not yet registered.</td>
</tr>
<tr>
<td>SEP. 19</td>
<td>Classes begin for fall quarter.</td>
</tr>
<tr>
<td>SEP. 20</td>
<td>Late registration (for temporary students). All students will be assessed a late fee: $25.00 for full time students, $10.00 for part time students.</td>
</tr>
<tr>
<td>SEP. 22</td>
<td>Last day to adjust class schedule (end of add-drop period).</td>
</tr>
<tr>
<td>OCT. 13</td>
<td>Last day to make application for graduation for students who will complete requirements at end of fall quarter.</td>
</tr>
<tr>
<td>OCT. 28</td>
<td>Deadline for withdrawal without penalty. Last day for removing temporary student status.</td>
</tr>
<tr>
<td>NOV. 13-17</td>
<td>Graduate record exam (at designated centers). Registration for examination must be made 2 weeks prior to this date.</td>
</tr>
<tr>
<td>NOV. 16</td>
<td>Educational counseling and schedule advisement for winter quarter (for currently enrolled students).</td>
</tr>
<tr>
<td>NOV. 23-24</td>
<td>Last day to withdraw from a course or from the university. Last day to change from credit to audit, if passing.</td>
</tr>
</tbody>
</table>

Thanksgiving holidays. (University-wide)
CLASSES RESUME.

CLASSES END FOR FALL QUARTER.

FINAL EXAMINATION PERIOD.

SPECIAL GRADUATION CEREMONY.

GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

GRADES DUE IN REGISTRAR'S OFFICE.

CHRISTMAS HOLIDAYS BEGIN. (STUDENTS)

winter quarter 1973

LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO WINTER QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO WINTER QUARTER.

LAST DAY FOR RECEIPT OF APPLICATION FOR READMISSION TO WINTER QUARTER.

ORIENTATION AND ADVISEMENT FOR NEW FRESHMEN, TRANSFERS, AND ADVISEMENT FOR CURRENT AND FORMER STUDENTS NOT PRE-ADVISED.

REGISTRATION BY APPOINTMENT FOR GRADUATE STUDENTS.

REGISTRATION BY APPOINTMENT FOR CURRENT UNDERGRADUATE STUDENTS.

REGISTRATION FOR ANY ELIGIBLE CURRENT UNDERGRADUATE STUDENTS NOT REGISTERED.

REGISTRATION FOR FORMER UNDERGRADUATE STUDENTS BY APPOINTMENT.

REGISTRATION FOR NEW UNDERGRADUATE STUDENTS BY APPOINTMENT.

CLASSES BEGIN FOR WINTER QUARTER.

LAST DAY TO ADJUST CLASS SCHEDULE (END OF ADD-DROP PERIOD).
LATE REGISTRATION (FOR TEMPORARY STUDENTS). ALL STUDENTS WILL BE ASSESSED A LATE FEE: $25.00 FOR FULL TIME STUDENTS, $10.00 FOR PART TIME STUDENTS.

LAST DAY TO MAKE APPLICATIONS FOR GRADUATION FOR STUDENTS WHO WILL COMPLETE REQUIREMENTS AT END OF WINTER QUARTER.

GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

EDUCATIONAL COUNSELING AND SCHEDULE ADVISEMENT FOR SPRING QUARTER.

LAST DAY TO WITHDRAW FROM A COURSE OR FROM THE UNIVERSITY. LAST DAY TO CHANGE FROM CREDIT TO AUDIT, IF PASSING.

CLASSES END FOR WINTER QUARTER.

FINAL EXAMINATION PERIOD.

SPECIAL GRADUATION CEREMONY.

GRADES DUE IN REGISTRAR'S OFFICE.

spring quarter 1973

LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO SPRING QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO SPRING QUARTER.

LAST DAY FOR RECEIPT OF APPLICATIONS FOR READMISSION TO SPRING QUARTER.

ORIENTATION AND ADVISEMENT FOR NEW FRESHMEN, TRANSFERS, AND ADVISEMENT FOR FORMER AND CURRENT STUDENTS NOT PRE-ADvised.

REGISTRATION BY APPOINTMENT FOR GRADUATE STUDENTS.

REGISTRATION BY APPOINTMENT FOR CURRENT UNDERGRADUATE STUDENTS.
MARCH 23, 9:30 - 10:00 am (FRI.)
REGISTRATION FOR ANY ELIGIBLE CURRENT UNDERGRADUATE STUDENTS NOT REGISTERED.

MARCH 23, 10:00 - 10:30 am (FRI.)
REGISTRATION FOR FORMER UNDERGRADUATE STUDENTS BY APPOINTMENT.

MARCH 23, BEGINS 10:30 am (FRI.)
REGISTRATION BY APPOINTMENT FOR NEW UNDERGRADUATE STUDENTS.

MARCH 26, 8:00 am (MON.)
CLASSES BEGIN FOR SPRING QUARTER.

MARCH 28, 4:00 - 6:00 pm (WED.)
LATE REGISTRATION (FOR TEMPORARY STUDENTS). ALL STUDENTS WILL BE ASSESSED A LATE FEE: $25.00 FOR FULL TIME STUDENTS, $10.00 FOR PART TIME STUDENTS.

MARCH 28, UNTIL 3:00 pm (WED.)
LAST DAY TO ADJUST CLASS SCHEDULE (END OF ADD-DROP PERIOD).

MARCH 28 (WED.)
LAST DAY TO MAKE APPLICATION FOR GRADUATION FOR STUDENTS WHO WILL COMPLETE REQUIREMENTS AT END OF SPRING QUARTER.

APRIL 20 (FRI.)
SPRING HOLIDAY. (STUDENTS)

APRIL 23, 8:00 am (MON.)
CLASSES RESUME.

APRIL 23 (MON.)
DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

APRIL 28 (SAT.)
GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

MAY 21-25 (MON.-FRI.)
EDUCATIONAL COUNSELING AND STUDENT ADVISEMENT FOR THE SUMMER AND FALL QUARTERS.

MAY 23 (WED.)
LAST DAY TO WITHDRAW FROM A COURSE OR FROM THE UNIVERSITY. LAST DAY TO CHANGE FROM CREDIT TO AUDIT, IF PASSING.

MAY 28 (MON.)
MEMORIAL DAY HOLIDAY (UNDER THE 1968 UNIFORM MONDAY HOLIDAY ACT).

MAY 29, 8:00 am (TUES.)
CLASSES RESUME.

JUNE 1, 9:30 pm (FRI.)
CLASSES END FOR SPRING QUARTER.

JUNE 4-7 (MON.-THURS.)
FINAL EXAMINATION PERIOD.

JUNE 8, 12 noon (FRI.)
GRADES DUE IN REGISTRAR'S OFFICE.

JUNE 8 (FRI.)
COMMENCEMENT.
ACADEMIC YEAR ENDS.
summer quarter 1973

MAY 17 (THURS.)
LAST DAY FOR RECEIPT OF UNDERGRADUATE APPLICATIONS FOR ADMISSION TO SUMMER QUARTER. LAST DAY FOR RECEIPT OF GRADUATE APPLICATIONS FOR ADMISSION TO SUMMER QUARTER.

LAST DAY FOR RECEIPT OF APPLICATIONS FOR READMISSION TO SUMMER QUARTER.

JUNE 11 (MON.)
ORIENTATION AND ADVISEMENT FOR NEW FRESHMEN, TRANSFERS, AND ADVISEMENT FOR FORMER AND CURRENT STUDENTS NOT PRE-ADvised.

JUNE 14, BEGINS 6:00 pm (THURS.)
REGISTRATION BY APPOINTMENT FOR GRADUATE STUDENTS.

JUNE 15, BEGINS 9:30 am (FRI.)
REGISTRATION BY APPOINTMENT FOR CURRENT UNDERGRADUATE STUDENTS.

JUNE 15, 3:00 - 3:30 pm (FRI.)
REGISTRATION BY APPOINTMENT OF FORMER UNDERGRADUATE STUDENTS.

JUNE 15, BEGINS 3:30 pm (FRI.)
REGISTRATION BY PRIORITY NUMBER FOR NEW FRESHMEN AND TRANSFER STUDENTS.

JUNE 16 (SAT.)
GRADUATE RECORD EXAM (AT DESIGNATED CENTERS). REGISTRATION FOR EXAMINATION MUST BE MADE 2 WEEKS PRIOR TO THIS DATE.

JUNE 18, 8:00 am. (MON.)
CLASSES BEGIN FOR SUMMER QUARTER.

JUNE 20, BEGINS 4:00 pm (WED.)
LATE REGISTRATION (FOR TEMPORARY STUDENTS). ALL STUDENTS WILL BE ASSESSED A LATE FEE: $25.00 FOR FULL TIME STUDENTS, $10.00 FOR PART TIME STUDENTS.

JUNE 20 (WED.)
LAST DAY TO ADJUST CLASS SCHEDULE (END OF ADD-DROP PERIOD).

JUNE 20 (WED.)
LAST DAY TO MAKE APPLICATION FOR GRADUATION FOR STUDENTS WHO WILL COMPLETE REQUIREMENTS AT END OF SUMMER QUARTER.

JUNE 29 (FRI.)
DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

JULY 4 (WED.)
INDEPENDENCE DAY HOLIDAY. (UNIVERSITY-WIDE)

JULY 5, 8:00 am (THURS.)
CLASSES RESUME.
JULY 13 (FRI.) DEADLINE FOR WITHDRAWAL WITHOUT PENALTY. LAST DAY FOR REMOVING TEMPORARY STUDENT STATUS.

AUGUST 3 (FRI.) LAST DAY TO WITHDRAW FROM A COURSE OR FROM THE UNIVERSITY. LAST DAY TO CHANGE FROM CREDIT TO AUDIT, IF PASSING.

AUGUST 6-10 (MON.-FRI.) EDUCATIONAL COUNSELING AND STUDENT ADVISEMENT FOR FALL QUARTER.

AUGUST 17 (FRI.) CLASSES END FOR SUMMER QUARTER. FINAL EXAMINATIONS GIVEN AT THE DISCRETION OF THE INSTRUCTOR. SPECIAL GRADUATION CEREMONY.

AUGUST 20, 12 noon (MON.) GRADES DUE IN REGISTRAR'S OFFICE.
FLORIDA
TECHNOLOGICAL
UNIVERSITY

INSTITUTIONAL PURPOSE

Florida Technological University has been established as one of the nine state universities in Florida to provide higher educational opportunities to the people of the State through teaching, research and service. Its assigned role is that of a four-year general purpose institution to offer baccalaureate degree programs, as well as doctor’s and master’s degree programs when established criteria for initiating such programs have been attained. Its uniqueness is in emphasizing the development of teaching and research programs in various technologies and the arts and sciences.

Florida Technological University offers baccalaureate degree programs in humanities and fine arts, social sciences, natural sciences and mathematics, business administration, education, engineering, and general studies. Master’s degree programs are offered in business administration, communications, education, engineering and industrial psychology. Authorization for additional graduate degree offerings in selected disciplines will be sought at appropriate intervals. The University also offers an extension program of credit courses, short courses, conferences, etc., to the citizens of the East Central Florida Region through Continuing Education.

The University has developed an environmental studies program which emphasizes the social, political, and economic implications of technological development in modern society. In addition developments within this context include opportunities for students to major in computer science, medical technology, inhalation therapy and medical records science. Future developments will attempt to relate the traditional academic endeavors of the University to the technological orientation of industrial activities in this region of the State.

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 on 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 Administration Building, the General Classroom Building, the Computer Center and the University Library.

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.

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 complete. The work represents a value of approximately $6.5 million in modern, functional structures: the 31-classroom General Purpose Classroom Building; the Administration Building; and the massive Engineering Building.

Construction of the third phase will include expansion of the Village Center, a Humanities/Fine Arts Building, a Biology project, and expansion of current utilities.

Growth and progress are two pertinent words today as FTU moves forward with an eye upon projected enrollments expected to reach 25,000 by 1980. The total 1971 Fall enrollment was 6,596.

THE CAMPUS IN 1972-1973

A winding road lined with oak and pine extends from the main entrance of FTU on Alafaya Trail (SR 520) to the heart of the campus. At the center of what some day will be a vast complex of buildings are the huge Library and Administration buildings. The two are separated by a large reflecting pool. The imposing five story Library was the first major building completed at FTU. In addition to housing the library it contains some classrooms, an instructional media center, language library, radio-TV complex and some faculty offices.

The attractive, new brick and concrete Administration Building, directly across the pool from the Library, houses the offices of the University President, his three vice presidents, the Deans of three of FTU’s Colleges, the offices
of admissions/registrars, personnel, student affairs, public information, publications, certain key faculty members, and classrooms.

As you look to the right of the Library and Administration Buildings and face East, you see the massive Science Technology Complex that serves as the "headquarters" for the College of Engineering and FTU's Information Systems. Classrooms, laboratories, and several large lecture halls comprise the majority of space in the $3.4 million Engineering Building.

Adjacent to the Engineering Building is the Science Building, occupied by the College of Natural Sciences. The structure contains classrooms, teaching and research laboratories. The Science Lecture Hall seats 320 persons.

To the left of the Library and Administration Buildings is the General Classroom Building, which serves, in addition to classroom space, as offices for two of FTU's Deans and faculty members.

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 current expansion of the Village Center will double its present size. Adjacent to the Village Center are four residence halls, capable of housing 432 students. Each of the buildings has quarters for 108 residents. Two of the double-story buildings are for women students; two are for men. Students live in suites composed of a bedroom-study area, a living room, and bath. There are 48 single-person suites in the four buildings; all others are designed for two students.

The outdoor recreational facilities are designed to accommodate the physical education academic programs, the organized intramural program, and the informal recreational activities. Available facilities include lighted tennis and handball courts, a flag football-soccer field, a swimming pool, a golf driving range with putting greens, volleyball courts, and a baseball field.

THE EAST CENTRAL FLORIDA AREA

The 1970 population of the East Central Florida region was 922,068. Tremendous growth is forecast for this region. It 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 349,000 library volumes are shelved in the 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. The Central Florida Civic Theatre Association has raised $350,000 for a new theatre near the Loch Haven Art Center. In addition, area theatre-goers are enjoying the Sebastian Dinner Theatre, the FTU Village Players, and the Annie Russell Theatre productions. There are several art galleries and museums in the area, and there is 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, exhibits, and displays, many of them with a space-age orientation.

There are many reasons for Orlando and Orange County's fantastic growth and development in the past two decades: its strategic location as a transportation hub, the growth of clean, light industry, its ideal climate, its proximity to the Kennedy Space Center, and certainly the many cultural activities.

Although some today refer to Orlando as the ACTION CENTER OF FLORIDA, the city is still the "City Beautiful"
to many with its parks and flower gardens within its confines. Eola Park, Leu Gardens, Loch Haven Park, Mead Gardens and the Kraft Azalea Gardens in Winter Park are but a few of the community's many beautiful parks where an array and variety of exotic flowers bloom almost every month of the year. Shopping plazas and stores in the Orlando-Winter Park area run the gamut from modern, air-conditioned malls to quaint boutiques with an Old World atmosphere.

Sports enthusiasts will appreciate the many opportunities for boating, fishing, and swimming. Orlando is the spring headquarters for the American League Minnesota Twins baseball club and the home for the Class A Orlando Twins, a Minnesota farm club. The PGA Citrus Invitational Golf Tournament drawing many top names is held each March at Rio Pinar Country Club, one of a dozen challenging courses in the area. In addition, the Walt Disney World Invitational is a special new feature for golfers.

The world's largest and most famous harness horse training center, owned and operated by the city, is the Ben White Raceway on Lee Road. Tennis, bowling, shuffleboard, sailing, water skiing, jai-alai, dog racing and most other sports can be enjoyed in the Orlando area regardless of whether a participant's or spectator's viewpoint is desired.

This section of the Bulletin would not be complete without a description of the Florida Disney World. This 43 square mile complex is located approximately 15 miles southwest of Orlando, and adjacent to Interstate 4. Disney World presently consists of a Theme Park similar to Disneyland in California, but five times as large. Adjoining the Theme Park are motels, hotels, a campsite, plus recreation and entertainment facilities for the entire family. Walt Disney World opened officially October 25, 1971. It is predicted that the park's impact on this area will produce $6.6 billion in new income; $343 million in new tax receipts from 37,700 new dwelling units, 328 new hotels and 19 million first-time visitors. The current population in this area is expected to grow by 50 percent in the next decade.

Still in the Phase II planning stage are:

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

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

ACCREDITATION

The University is accredited by the Southern Association of Colleges and Schools, the official accrediting agency for all educational institutions in the South.

FTU is listed in Report of Credit Given By Educational Institutions, 1971 (page 24) 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, INC.

The FTU Foundation, Inc. is a corporate body formed with the primary function of assisting the University financially in the financial aid program, scholarship program and in institutional development. The funds raised by the Foundation for financial aid to students are granted based upon the recommendation of the Director of Student Financial Aid. Requests for assistance should be submitted to the Student Financial Aid Office.

LIBRARY SERVICES

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 125,000 volumes, and will be increased by some 25,000 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 Media Center, 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.

**UNIVERSITY BOOKSTORE**

The University Bookstore, located in the basement of the Library Building, carries required textbooks, supplemental books, and associated supplies for all FTU courses. In addition, a complete line of school and art supplies, sundries, paperbacks, gifts, and other items of interest are available. A Customer Service Desk is provided for special orders, such as class rings, books, etc.

Personal checks, when accompanied by a student I.D. card, are honored for the purchase of books and supplies. Checks for cash in amounts up to $20.00 will normally be honored by the Bookstore. Students are urged, however, to use the University's Cashier's window in the Administration Building for this purpose.

During the last three days of each quarter, the Bookstore has a “buy-back” period for used text books. Student I.D. cards must be presented for identification.
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 creating a favorable environment for student learning; personalizing 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, placement, 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. Information is mailed to students indicating the date on which they are to report for orientation. During orientation students meet members of the faculty and administration. They also receive instructional information to facilitate registration.

HOUSING POLICY

I. 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 nine 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 agreement. 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 AGREEMENTS 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 SERVICE

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 is on campus Monday through Friday during routine clinic hours and is available on an on-call basis for emergencies. A staff of registered nurses will be on duty 24 hours when classes are in session. Medical care in the students’ 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 Student Health Service in case of illness or injury, except in matters of public or campus health. The insurance program, however, is based upon the primary utilization of the Student Health Service. Referral will be made in the more serious cases. The right of the student to choose his own source of medical care on referral will be recognized. Medical records are privileged communications, and will not be released without the consent of the student, except when information is essential to public health.

A campus emergency vehicle, manned by security personnel, is available for transporting emergency cases to the Student Health Service or to local hospitals.

STUDENT FINANCIAL AID INFORMATION

PURPOSE

Florida Technological University subscribes to the principle that the purpose of financial aid is to provide assistance to students who, for lack of funds, would otherwise be unable to attend college. Financial aid is awarded according to each individual’s need in relation to college costs. Awards may include scholarships, grants, loans and part-time employment which may be offered to students singly or in various combinations. Our financial aid staff is dedicated to the principle that each student must receive personal attention with complete confidentiality. Every effort is made to provide financial counseling by experienced, considerate personnel.

APPLICATION

The application period for financial aid is November 1 through April 1 for the academic year beginning the following September. Applications received after April 1 are accepted conditionally. In addition to the FTU application, parents or guardians or the independent student must complete a Financial Statement. Upon completion, this statement should be mailed directly to the College Scholarship Service or the American College Testing Service. The fact that a student is married does not preclude parental support. These forms may be obtained from your high school or junior college counselor or from this office. Receipt of an award does not automatically renew an application for subsequent years. A new application must be submitted each year.

Consideration for assistance is based on the student’s academic record, availability of funds and the parents’ financial condition. It is not always known what federal, state and local funds will be available. Many awards must be extended initially on a tentative basis. If you receive assistance from sources other than the Student Financial Aid Office, your award may be adjusted. Applicants who fail to notify this office of assistance from other sources are subject to complete withdrawal of aid.
ESTIMATED EXPENSES — 1972 - 1973
ACADEMIC YEAR (THREE QUARTERS)

STUDENT BUDGETS

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<th>Expense Categories</th>
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† Residing at home.
*Graduate Fees are $720.

Expenses outlined above are to be considered as general estimates.

Note: Add $1,050 for non-Florida residents.

PROGRAMS AVAILABLE AT FLORIDA TECHNOLOGICAL UNIVERSITY

LOANS

National Defense Student Loan Program: Authorized by the National Defense Education Act of 1958 and amended as Part D, Title IV of Higher Education Act, 1965, the National Defense Student Loan Program provides a low-interest program of loans to students who have been admitted, show proven financial need and remain in good standing. The law provides that the maximum loan to a student is $5,000 for his undergraduate college career and the maximum loan for a single academic year may not exceed $1,000.

A special provision of the law applies only to teachers enabling borrowers who teach in public elementary or secondary schools to cancel 10% of their loans with interest, for each year of teaching service for a maximum of five years. More recently the same cancellation privilege has been extended to borrowers who teach in private, non-profit elementary or secondary schools of higher education. Additional cancellations of loan principal may be made at the rate of 15% per year by those who teach in school communities having a high percentage of low-income families as approved by the Department of Health, Education and Welfare. All recipients of the National Defense Student Loan will be required to arrange an exit interview with the University Cashier during their last quarter at Florida Technological University.

Florida Student Loan Program: Students who have been a legal resident of the State of Florida for the past two years, taking 12 hours or more for credit, and as an undergraduate have at least a 2.0 overall average and an adjusted gross income of $15,000 or less per year are eligible to apply for this loan. Florida Student Loans bear interest at the rate of 4% per year, which begins at graduation or termination as a full-time student. Repayment must begin no later than 6 months following graduation or termination of full-time college attendance.

Law Enforcement Educational Loan Program: Long-term loans are available to students who desire to seek a career in law enforcement. Eligible students may borrow up to $1,800 per academic year. An applicant must be a full-time student in an undergraduate program. The program of study and/or credit must lead toward a certificate or a degree in a program directly related to law enforcement. The student’s program of studies must contain a minimum of 12 quarter credit hours in subjects directly related to law enforcement. Long-term loans carry a 7% simple interest rate per annum and are repayable over a maximum of a 10 year period. The principal amount of any loan plus interest shall be canceled for service as a full-time officer or employee of a public funded law enforcement agency at the rate of 25% per annum for each completed year of employment in law enforcement.

Federally Insured Student Loan Program: This Federally sponsored program provides insurance for long-term, low-
interest loans made by authorized lenders (Banks, Savings and Loan Associations, Credit Unions, Pension Funds and Insurance Companies). The maximum loan amount per academic year (three quarters) is $1500 ($500 per quarter). The total outstanding principal may not exceed $7500 at any one time. The interest rate paid to the lender may vary from 7% to 10%. The Federal Government pays the interest on the loan while the student is in school if he is qualified for interest benefits (adjusted family income less than $15,000). If not qualified, the student must pay the interest himself.

Repayment of the loan starts between nine and twelve months after the student completes his course of study, leaves school, or is registered for less than six hours of course loan and the student must repay the principal plus 7% interest on the outstanding balance. Repayment is normally scheduled to be completed over a five to ten year period. Prepayment is allowed without penalty.

An application for this loan may be picked up at the lending institution or the Student Financial Aid Office.

Emergency Short-Term Loan Program: 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 the amount of undergraduate fees. There is a 2% service charge made on each loan.

Student Regent-Fee Loan: The S.R.F. Loan is a long-term loan authorized by the Board of Regents with student fees providing the funds. The S.R.F. loan is administered by the Florida Technological University, Student Financial Aid Office. Repayment of the loan will begin no later than six (6) months after the borrower graduates or ceases to be a full-time student. Interest at an ANNUAL PERCENTAGE RATE of 3 percent shall accrue from the date of graduation or termination of full-time college attendance.

SCHOLARSHIPS/GRANTS

Non-Florida Tuition Scholarships Waiver: The Board of Regents has authorized the university to waive tuition for non-Florida residents to a limited number of students. These waiver units will be awarded to non-Florida students having the skills or abilities which will make a positive contribution to the academic environment of faculty and students at Florida Technological University. This contribution may be in the areas of academics, athletics, music, drama, fine arts, and to graduate assistants and foreign students.

Educational Opportunity Grant Program: The Educational Opportunity Grant is a Federal Government program designed to provide assistance for qualified students who are of exceptional financial need. Applicants for this program must be accepted for enrollment or be in good standing as a full-time undergraduate student. They must also be a citizen of the United States, or live in the United States for other than a temporary purpose and intend to become a permanent resident thereof. Students must show evidence of academic and creative promise and capability of maintaining good standing in their course of study. Funds under the Educational Opportunity Grant Program may be awarded in the maximum amount of $1000 or one-half of the total amount of student financial aid need. Applicants must need and agree to accept an equivalent amount of matching funds made available through the institution from such sources as loans, scholarships, and employment programs.

Law Enforcement Education Grant: The Law Enforcement Student Grant Program is intended to act as an incentive for in-service law enforcement personnel to increase their competence and their value to their employing agencies through the education process. The grant program makes available funds for tuition, fees and books only, not to exceed $200 per academic quarter. The grant program is restricted to full-time in-service law enforcement officers of local, State and Federal units of government. Eligible Students may enroll for part-time or full-time study in courses for which credit may be earned that may be applied in satisfying the requirements for an Associate of Arts degree. Grant funds may be advanced only to applicants who enter into an agreement with the Justice Department to remain in the service of their law enforcement employment agency for a period of two years following completion of any course for which grant funds are used. Grant funds are to be awarded to in-service law enforcement officers without regard to financial need.
Brecht Scholarships: Brecht Scholarships are available to Brevard County students to assist them in attending any college or university in the state of Florida. The amount of the award for each student will be determined after an analysis of his financial need by the College Scholarship Service and will be related to the budget established by the college or university attended. As long as the student submits an application, shows need, and maintains a passing academic average, the scholarship may be continued.

EMPLOYMENT:

College Work-Study Program: This program is a Federal program designed to provide a student the chance to pay part of his educational expenses by working at a part-time job. In order to be employed under the College Work-Study Program, the student must: (1) be enrolled or accepted for enrollment as a full-time student; (2) show evidence of exceptional financial need; (3) be capable of maintaining good academic standing while employed under this program.

Employment under the College Work-Study Program is limited to 15 hours per week while classes are in session. During vacation periods and summers, students may work up to 40 hours per week, subject to the availability of funds.

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 posted on the SFA bulletin board in the lobby of the Administration Building.

Financial Planning: In planning college finances, you should carefully examine the estimated expenses listed below. Next, you and your parents (if applicable) should determine how much help they will be able to give you, as well as how much you may be able to save from your summer work. You should add to this figure anticipated income from any other sources such as local scholarships, gifts from relatives, prior savings, etc. After you have added up all the income you will have from all sources, subtract the total from the college budget. If this calculation reflects a deficit, this need should be shown on your application. Your analysis will be compared with our analysis of the information submitted on your Parents' Confidential Statement. After reconciling the two, a financial aid “package” will be designed to fit your individual needs.

SUMMARY

All financial aid is dependent upon the availability of resources. To be considered for financial aid, an applicant must: be a full-time student with a minimum of 12 hours per quarter, be in financial need, make normal academic progress, and be of good character. An award cannot be made until the applicant has been accepted for admission to Florida Technological University. However, applicants should not wait for notice of acceptance but should apply as soon as possible after November 1. The Office of Student Financial Aid reserves the right to cancel or refuse to renew financial aid to any student who uses these program funds for unreasonable, non-college related expenditures.

PLACEMENT CENTER

Career planning, campus interviews, and employer contacts are essential aspects of the Placement Center. 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, and education. Both career planning and job placement are facilitated through early student contacts with the Placement Center.

All students are urged to register with the Placement Center at least three quarters prior to graduation. All inquiries should be directed to the Director of Placement.
DEVELOPMENTAL CENTER

The Developmental Center offers a professional staff of counselors to aid students in selecting vocational-educational objectives, overcoming study difficulties, solving problems of personal-social adjustment, and developing speech or hearing skills. A full range of tests is available along with an occupational library, developmental reading and study skills service, a listing of students available as tutors, and a speech and hearing service.

Any student may request the assistance of the Center whenever he feels the need. He might, for example, desire increased understanding of himself and his relationship with others or he might seek to gain additional satisfaction from his learning experiences. A commonly used diagnostic procedure includes the administration of tests to help the individual student evaluate his own interests, aptitudes and abilities. The services of the Center are voluntary and all aspects of counseling are confidential.

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 interests of students and to provide opportunities for students to become acquainted with fellow students and faculty members.

STUDENT GOVERNMENT

The purpose of the Student Government at Florida Technological University is to 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 and legislative branches. The Student Senate is composed of representatives from every college and class. 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 opinions and ideas through representative legislators, a student may gain valuable experience in the democratic processes - its freedoms and responsibilities. Students interested in working with the Student Government may obtain information from any member of Student Government or from the Office of Student Affairs. Student Government offices are located in the Library Building.
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 the Panhellenic Council, Intrafraternity Council, 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.

CLASSROOM RESPONSIBILITY

Students are responsible for maintaining a classroom decorum appropriate to the educational environment. When the conduct of a student or group of students varies from acceptable standards to such an extent that normal classroom procedures are interfered with, the instructor has the authority to remove the offending party from the room.
SCHEDULE OF FEES

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

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) ... $15.00

B. Registration Fees (per quarter)

ON-CAMPUS COURSES

<table>
<thead>
<tr>
<th></th>
<th>Resident 1</th>
<th>Non-Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
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<tr>
<td>Full-time (9 hours or more)</td>
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<td>16.00 per hour</td>
<td>43.00 per hour</td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time (9 hours or more)</td>
<td>240.00</td>
<td>590.00</td>
</tr>
<tr>
<td>Part-time (8 hours or less)</td>
<td>20.00 per hour</td>
<td>47.00 per hour</td>
</tr>
</tbody>
</table>

For purposes of assessing fees, a full-time student is an individual who registers for 9 quarter hours or more.

OFF-CAMPUS COURSES

<table>
<thead>
<tr>
<th></th>
<th>Resident 2</th>
<th>Non-Resident</th>
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</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>$19.00 per hour</td>
<td>$46.00 per hour</td>
</tr>
<tr>
<td>Graduate</td>
<td>23.00 per hour</td>
<td>50.00 per hour</td>
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</table>

C. Room and Board (required of student living in University residence halls) per quarter .... $313.00 — $348.00

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

D. Books and supplies (estimated) per quarter ... $50.00

E. Late Registration (for all students who register after the time provided under the academic calendar)
   Full-time student ................. $25.00
   Part-time student .............. $10.00

F. Vehicle Registration (required of everyone operating a motor-powered vehicle on campus) per calendar year for full-time, part-time students, and courtesy students from other institutions. Students' fee ......... $ 2.00

CHECKS

The University will accept personal checks for accounts due to 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.

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.

A. Full refund up to the end of the "drop/add" period.

1Since off-campus or Continuing Education students are considered part-time students, they may register for an unlimited number of courses on an hourly basis. A combination of off-campus and on-campus hours will not be used to determine full or part-time status.

2To determine Florida residence requirements, see page 37.
B. No refund after the end of the "drop/add" period, except:

1. Involuntary call to active military service (full refund less $40.00).

2. Death of student (full refund less $40.00).

3. Where a student contracts an incapacitating illness of such duration and severity as to prevent the successful completion of the academic program for the term enrolled, a fee refund of $40.00 will be made.

No refunds will be made under this policy except upon proper application. Commensurate refunds will be made to part-time students at the rate of $3.00 per credit hour.
FRESHMAN APPLICANTS (First College Attended)

The following classes of applicants are 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 total or higher on the SAT (CEEB) – with no lower than 400 on either the verbal or math portion.
- 21 composite or higher on the ACT
- 60% or higher on the CQT (Senior College Freshman Norms)

Graduates Possessing a High School Equivalency or a General Education Development (GED) Diploma who have an acceptable high school record for the portion attended, have an acceptable test score and, where necessary, a favorable recommendation from their employer.

Graduates Who Meet Requirements in the First Two Categories Above, But Who Were 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 Do Not Meet These Entrance Requirements and Are Considered Borderline Admission Cases are referred to the University Admissions and Standards Committee for review. Occasionally, it may be recommended that a student attend a Junior College to further his competency and to earn an Associate of Arts degree before reapplying to FTU.

High School Graduates Who Score Below 300 on the Florida State-Wide Twelfth Grade Test and who have an above average high school record will be considered for admission assuming the other requirements previously stated have been met.

TRANSFER APPLICANTS

Undergraduate students transferring to degree programs from another institution 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 "D" (1.0) 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 Undergraduate Degree Requirements, page 38 and Second Bachelor's Degree, page 46).

Transfer students from Florida State Junior Colleges or Universities may satisfy the Basic Environmental Studies Program requirements by completing, prior to transfer, the general education program prescribed by the junior college or university. Transfer applicants with incomplete General Education Programs (FTU Environmental Studies Program) from state institutions will have their credits evaluated on an individual basis.

1. Florida State Junior College Transfers. Admission to the University is normally granted to any graduate of an accredited junior college in the State of Florida who has completed the college parallel program and graduated with a 2.0 GPA based upon all work attempted. Admission Standards for all Florida state-supported universities are established by the Florida Board of Regents.*

2. Private Colleges and Out-of-State Institutions. The general education program credits 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.

The Admissions and Standards Committee membership is composed of representatives from the faculty, the student body, the Student Affairs' Office and the Admissions Office. This committee meets weekly to review marginal cases and to consider the appeals of applicants.

ADMISSIONS — Provisional

Students who transfer from regionally unaccredited high schools or colleges 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 28 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 if full-time student or $10.00 if part-time student.

RECORDS DEADLINE — All Support Documents

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

*Board of Regents Manual pages 2-50 through 2-55.
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 28 days before the beginning of the quarter of expected attendance. (See calendar).

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 readmitted on academic warning or academic probation as appropriate.

SPECIAL STUDENTS

Students of demonstrated academic ability who do not meet the regular requirements for admission may register for occasional courses at FTU. Permission to enroll in this Special Student category should be obtained from the Dean of the College in which the student wishes to take course work.

If the prospective special student is a minor, in addition to the above he must:

1. obtain the written permission of his parents,
2. request a statement of recommendation from the principal of his high school or, if employed, from his employer (to be mailed directly to the University Admissions Office), and
3. have an interview with the Director of the Developmental Center.

Applications may be obtained from the Admissions Office.

Failure to perform at a “C” level in all courses attempted at FTU will result in a student being unable to take further courses until he has met the regular requirements for admission.

All credits earned at FTU will always be a part of the student's permanent record.

TEMPORARY STUDENT

Any student who applied before the application deadline date and is permitted to register and attend classes without a complete admission file, is granted a maximum of four weeks (first 20 class days), to furnish all required records. Failure to do so, or if records indicate ineligibility, will result in withdrawal at the discretion of the University Registrar and no fees will be refunded.

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 and 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. 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.

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.

CONCURRENT ENROLLMENT

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

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 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 applying to change their status and work toward a degree must meet the admissions requirements of such students and earn a minimum of 24 quarter hours with a minimum of 2.0 GPA on all FTU 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 applicants (9 or more quarter hours) must furnish a health report on the approved university health form. It must be submitted to and approved by the Student
Health Service before registration will be allowed. All transfer students must submit (prior to registration) the approved “Student Information Form” from their last college attended to our Student Affairs Office.

**FLORIDA RESIDENCE**

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.

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 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.

**ORIENTATION AND ADVISEMENT**

After the applicant has been advised of his admission, he will be assigned a priority number and time for registration. However, prior to registration, **he is required** to attend a University orientation program to be followed by a conference with his academic advisor. An advisor will be assigned from the department of the student’s major; however, each student will be expected to study the bulletin carefully and will be responsible for meeting the University’s requirements as well as those of his own College and major.

**TRANSFER CREDITS**

A transfer grade of less than “D” may not be utilized 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. Degree credit will be awarded for those courses successfully completed 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. An Instructor may not give an examination until the official permit has been received.
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.

ADVANCED PLACEMENT – COLLEGE LEVEL EXAMINATION PROGRAM (CLEP)

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.

Credit in the Environmental Studies area may be granted to those who score 550 or above on any of the 5 basic sections of the General Examinations.

<table>
<thead>
<tr>
<th>Area</th>
<th>Score</th>
<th>Credit</th>
<th>Environmental Studies Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>550 or above</td>
<td>3qh</td>
<td>Communications III (ENG 102 or 103)</td>
</tr>
<tr>
<td>Humanities</td>
<td>550 or above</td>
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<td>Humanities</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Social Studies</td>
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<td>Social Environment I</td>
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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

AIR FORCE ROTC

The University has been approved for an Air Force ROTC Program to begin with the Fall term, 1972. Contact Admissions Office for further details concerning the program.

DEGREE REQUIREMENTS

UNDERGRADUATE

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

The minimum bachelor degree requirements for all students are as follows:

A minimum of 183 quarter hours credit with at least a "C" average (2.0 GPA) for all course work attempted (both FTU and overall).

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

A minimum of 72 quarter hours of work taken for the 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.

A student has the option of fulfilling the course requirements for graduation under any single FTU Bulletin in force during his most recent period of continuous attendance. The use of a combination of Bulletins to fulfill degree requirements is not permitted. Should his attendance be interrupted, his continuous attendance would begin with his most recent admission. Summer quarters are not included in determining interrupted attendance. Except for the foregoing, the Ad-
Administrative and Academic Policies of the current Bulletin will be considered official for graduation. 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, provided his attendance continues uninterrupted including his transfer to FTU.

GRADUATE

The University graduation requirements must be met by each student who wishes to receive a degree from Florida Technological University. To meet minimum master's degree requirements, all students must complete at least 45 quarter credit hours of graduate work, with a minimum average of "B" for all courses attempted. At least one-half of the minimum required course work must be numbered 600 or higher.

Additional degree requirements are specified in this Bulletin in the section on Graduate Studies and in the appropriate sections of the individual colleges offering graduate programs.

All students must take the Graduate Record Examination (GRE), except those students in Business Administration who must take the Admission Test for Graduate Study in Business (ATGSB).

DEGREES OFFERED

UNDERGRADUATE

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
Systems, Mechanical Engineering and Aerospace Sciences, plus other interdisciplinary areas such as Biomedical Engineering, Engineering Design, Engineering Operations, Engineering Physics, Systems Engineering

V. B.A. OR B.S. IN GENERAL STUDIES
Offered through the office of the Vice President for Academic Affairs

GRADUATE

Graduate degrees are available in the following colleges:

1. College of Business Administration
   Master of Business Administration (M.B.A.)

2. College of Education
   Master of Education (M.Ed.)

3. College of Engineering
   Master of Science in Environmental Systems Management (M.S.E.S.M.)
   Master of Science in Engineering (M.S.E.)
   Master of Science (M.S.)

4. College of Social Sciences
   Master of Science (M.S.) — Industrial Psychology
   Master of Arts (M.A.) — Communications

REQUIREMENTS FOR TEACHER CERTIFICATION

Before a person can teach in the elementary and/or secondary schools in Florida he or she must be certified by the Florida Department of Education. The certification requirements in Florida include 3 basic components:

I. GENERAL PREPARATION
Courses included in this category are normally classified as general education (i.e., Environmental Studies Program) courses. A graduate with a Bachelor's degree from an accredited institution shall be considered to have met the General Preparation requirements.

II. TEACHING SPECIALIZATION
Courses included in this category are normally classified as the major area in a student's college program. However, not all college majors are included in the certification laws; e.g., Psychology, Engineering, Humanities. Sections 7 through 36 of the Florida Requirements for Teacher Certification, January 30, 1968, describe the major areas eligible for teacher certification and each section has an outline for any special subject requirements in the Teaching Specialization.

III. PROFESSIONAL PREPARATION
There are two means by which students can complete a program in Professional Preparation. They are:

1. The College of Education Career Teacher Program (i.e., a major in the College of Education).

2. The Alternate Basic Certification Program (i.e., a major in some other college).

Students at Florida Technological University may achieve teacher certification by either of the following methods:

1. Completing the College of Education program whereby students will automatically be eligible for a Florida Teacher's Certificate.

2. Completing a degree program in another college within the University and, at the same time, satisfying all requirements needed for certification.

1See General Studies - page 51.

2Funded by RETRO
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.

GRADING SYSTEM

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

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
WF - Withdrawn Failing ............................ 0 grade point
WP - Withdrawn Passing ........................... 0 grade point
I - Incomplete ....................................... 0 grade point
X - Audit (no credit) ................................ 0 grade point
S - Satisfactory (credit or non-credit course) 0 grade point
U - Unsatisfactory (no credit) .................... 0 grade point
R (followed by grade) - Subsequently repeated (no credit) .......................... 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 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.

INCOMPLETE GRADE

A grade of “I” (Incomplete) is assigned by the instructor when a student is unable to complete a course due to extenuating circumstances, and when all requirements can clearly be completed in a short time following the close of regular classes. The Registrar’s Office must be notified of the appropriate grade to be assigned when requirements for the removal of the “I” have been completed. Failure to complete course requirements during the next successive quarter (that is, during the quarter immediately following that in which the “I” was assigned) may, at the discretion of the course instructor, result in the assignment of an “F” grade. It is the student’s responsibility to arrange with the instructor for the removal of the “I” grade. The grade of “I” becomes a part of the student’s permanent record if not removed during the following quarter. A student may register for a course in which an “I” was received.

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 3.60 to 3.79 - magna cum laude
3. Total grade point average 3.40 to 3.59 - cum laude

General honors are based on a minimum of 72 quarter hours of full-time attendance. The grade points used are those earned 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

The Deans’ List is recognition of scholastic honors for students who register for and complete at least 12 Quarter Hours with a 3.4 GPA and no grade less than “C” during a quarter. These students 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 ............................... 3.60 to 3.79 Qtr. GPA
Cum laude list ........................................ 3.40 to 3.59 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 three to five days of each quarter - see calendar). After the add-drop period, 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.)

Drop: Students may drop a course during the official Add-Drop Period (the first three to five days of each quarter - see calendar). 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 add-drop period, 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 for presentation in the registration line.

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. A student remains in good standing academically as long as he achieves normal academic progress required for graduation.

STUDENT CLASSIFICATIONS

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

- FRESHMAN: through 44 hours
- SOPHOMORE: 45-89 quarter hours
- JUNIOR: 90-134 quarter hours
- SENIOR: 135 or more quarter hours, prior to completion of baccalaureate requirements
- POST-BACCALAUREATE: any student enrolled in graduate-level courses who has a baccalaureate degree but not admitted to a Graduate Program
- GRADUATE: any student enrolled in Graduate courses who has been admitted to a Graduate Program

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>9 Qtr. Hrs.</td>
</tr>
<tr>
<td>Selective Service</td>
<td>12 Qtr. Hrs.</td>
</tr>
</tbody>
</table>

VETERAN’S BENEFITS

Full-Time Allowance
Students qualifying may receive full VA Benefit Allowance if registered the entire quarter for as many quarter hours as there are weeks during the quarter (inclusive of the registration and final examination days). Twelve (12) quarter hours will be counted as full-time even though there may be more than twelve (12) weeks in the quarter. In special cases where Graduate student registration varies from the above standards, full-time certification may be recommended by the Dean of Graduate Studies.
Three-Fourths Allowance
Three-fourths allowance will be allowed for nine (9) quarter hours during a regular quarter.

One-Half Allowance
One-half allowance will be allowed for six (6) quarter hours during a regular quarter.

PLEASE NOTE: Veterans must contact their local VA Office and obtain their Certificate of Eligibility which they must then furnish the FTU Registrar's Office in order to receive any due benefits.

Students registered for less than nine 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.

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

**TEMPORARY:** A student that applied on time and is permitted to register and attend class pending completion of his admissions file.

**TRANSIENT:** (1) A student registered at Florida Tech with the approval of some other university or college where he is regularly enrolled, or (2) a 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:

1. be enrolled for a minimum of 12 hours,
2. posses an FTU grade point average of at least 2.0 (C),
3. have received a minimum GPA of 2.0 for the preceding quarter,
4. be a degree-seeking student,
5. not be on academic warning, probation, or disciplinary probation.

An application for appeal due to an extenuating circumstance can be obtained from the Office of the Dean of Student Affairs.
### Academic Terms and Actions Defined

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter Average</td>
<td>Grade Point Average on work attempted during any given quarter.</td>
</tr>
<tr>
<td>FTU Average</td>
<td>Grade Point Average on all work attempted while in attendance at Florida Technological University.</td>
</tr>
<tr>
<td>Overall Average</td>
<td>Grade Point Average on all work attempted since entering college, including work from all previously attended institutions.</td>
</tr>
<tr>
<td>Academic Warning</td>
<td>First action taken when a student's FTU overall GPA drops below 2.0.</td>
</tr>
<tr>
<td></td>
<td>An FTU student is placed on Academic Warning only once. Subsequent action will be Academic Probation.</td>
</tr>
<tr>
<td>Academic Probation</td>
<td>Action taken if a student on Academic Warning does not achieve a 2.0 GPA or better in the subsequent quarter. This action is also taken when a student who has previously been on Academic Warning lets his overall FTU GPA drop below 2.0. Academic Probation will continue until such time as the student's overall GPA reaches 2.0 or better.</td>
</tr>
<tr>
<td>Disqualified</td>
<td>A student on Academic Probation is Disqualified when he fails to achieve a 2.0 GPA during the subsequent quarter. A student who is Disqualified may not enroll at the University for one quarter following disqualification.</td>
</tr>
<tr>
<td>Exclusion</td>
<td>If a student is readmitted after an appeal to the Admissions and Standards Committee following disqualification and still fails to achieve a 2.0 GPA, he is excluded from the University. Exclusion implies permanence and has no time limit.</td>
</tr>
</tbody>
</table>

### Appeal
Every student has the right to Appeal any of the preceding four academic actions either in person or in writing. The Appeal should be made to the Admissions and Standards Committee. Contact the Director of Admissions for procedure.

### Readmission
If a student has dropped out of the University for any reason, he must reapply on the appropriate form 30 days prior to the quarter he wishes to reenter.

First time FTU students may be admitted on either Academic Warning or Academic Probation at the discretion of the Admissions Officer or the Admissions and Standards Committee. Academic Warning and Probation are intended to inform the student making unsatisfactory progress of his need to alter study habits and to seek additional counseling. Early recognition will indicate to the student and to his parents the possible jeopardy to his academic goals, and will also allow an opportunity to demonstrate acceptable performance.

### 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 any 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 add-drop period, 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 ceases to attend a class or the university without approval at any time prior to the reporting of final grades will receive a grade of “F” in the course or courses so dropped.

Students may not change from credit to audit after the fourth week unless passing in the course to be changed.

Students may not withdraw from a class or from the University or change from credit to audit during the last two weeks of any quarter.

These withdrawal 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 is notified by and should report to the Registrar’s Office and initiate the process of application for graduation. 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. The student must report to the Registrar’s Office and make formal application for graduation.

2. The candidate is sent to his adviser with the forms necessary to check the courses needed to determine graduation requirements. The form will be completed and forwarded to the Dean of the appropriate college for his approval.

3. Upon the completion of graduation requirements, the student’s academic record will be checked by both the Dean of the College and the Registrar. If, for any reason, graduation requirements have not been met, the student will be notified immediately.

Successful completion of the degree requirements stated in the catalog under which the student has indicated he wishes to graduate shall constitute a recommendation of the respective college faculty that the degree be awarded, assuming the student is in good standing in the University.

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.

1See Academic Calendar – pages 9-17.
Candidates for graduation who anticipate enrolling in any graduate courses should register for, complete, and furnish satisfactory scores on the Graduate Record Examination (GRE), or the ATGSB for business majors, before they will be considered for admission. Contact the Developmental Center to complete this requirement.

**DOUBLE MAJORS (FTU STUDENTS)**

Any student satisfying all requirements for two majors shall be granted a single degree showing both majors.

**SECOND BACHELOR'S DEGREE (FTU STUDENTS)**

Graduates from accredited four-year institutions who apply for admission to work toward a second baccalaureate degree at Florida Technological University must meet the regular graduation requirements of the major department and the 45-quarter-hour residency requirement.

Any Florida Technological University student desiring to obtain two baccalaureate degrees must meet the requirements for both degrees and earn a minimum of 225 quarter hours.

Each student is responsible for reading and understanding the graduation requirements as stated in the catalog under which he plans to graduate.
GRADUATE STUDIES

GENERAL INFORMATION

The Office of Graduate Studies consists of a Dean who is assisted by a Graduate Council of appointed representatives from each college and the Faculty Senate. 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

Graduate study is available in the College of Business Administration, the College of Education, the College of Engineering and the College of Social Sciences. Additional graduate study areas 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 Dean of Graduate Studies. Applications which appear to meet minimum standards for admission are referred to the Dean of the appropriate College for his recommendation.

Applications will not be considered without complete official transcripts of all undergraduate and graduate work attempted. All transcripts must be received directly from the Registrar of the institution in which the work was attempted.

ADMISSION REQUIREMENTS

Regular admission to graduate study is normally dependent upon the presentation of a baccalaureate degree from an accredited college with a grade point average (GPA) of 3.0, a satisfactory test score* and acceptance by the Department or administrative unit offering the graduate program to which the prospective student is applying. A student may occasionally be provisionally admitted with less than a 3.0 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 the approval of the Dean of Graduate Studies. Applicants will receive their notice of acceptance and registration appointment from the admissions office.

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

Normally, nine quarter credits may be transferred to FTU for application to a Masters program. A greater number of credits as provided for by FTU Criteria for Master's Degree Graduate Programs may be transferred at the discretion of the Dean of the College upon a petition made by the student.

GRADUATE RECORD EXAMINATION REQUIREMENT

All students are required to submit scores on the Graduate Record Examination (GRE), except those in Business Administration, 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 of his own volition, to submit additional scores on one or more advanced subject matter tests of the GRE.

*Board of Regents minimums are: GRE — 1000, ATGSB — 450 for M.B.A. students only.
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. Advance 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 08450.

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 principal 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 12 hours of graduate credits or his first quarter of full time work. 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 members will be filed with the Office of Graduate Studies prior to the start of the student's second quarter.

LOADS

The maximum graduate registration 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 18 credits of dual
level course work can be included in the students' 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.

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 (3)
   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)
   COMP 103 Computer Fundamentals for Business Applications (3)
   ENG 102 Composition II (3)
   ENG 103 Current Literature (3)

Humanities  
   HUM 201 Western Humanities Survey (4)
   And any course from the Humanities Mind and Art Series, HUM 300 to HUM 310 (4)
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 Astronomy, Biology, Botany, Chemistry, Geology, Microbiology, Physics, and Zoology may be used in the Environmental Studies Program. ENGR 100 and 151 also may be included.

Social Environment

I. Social Sciences
Economics
ECON 201 and 202 or 203 (3, 3)
History
Any course in History
Political Science
Any course in Political Science

II. Behavioral Science
Anthropology
SOC 310, 311 (3, 3)
Psychology
PSY 201, 202 (3, 3)
Sociology
SOC 201, 202 (3, 3)

III. Foreign Language
Nine hours in either 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
This requirement may be satisfied by any course at the discretion of the student and his advisor. However, he is encouraged to consider courses in Art, Literature (with exception of ENG 103), Humanities (with exception of courses used to satisfy Humanities requirement of the Environmental Studies Program), Music, Philosophy, Physical Education, Religion, and Theatre.

ADVANCED PROGRAM (14) (Required of all students)

Business and Engineering Environment
(3 hours required from Groups I and II)

I. Business (3)
BADM 301 Business Concepts (3) or
BADM 302 Personal Investments (3)
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 (3)
ENGR 488 Man and Environment (3)

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

I. Humanities and Arts in Human Affairs
HFA 490 Humanities and Arts 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
ENGR 490 Engineering in Human Affairs (2)

VI. Social Sciences in Human Affairs
SSC 490 Social Sciences in Human Affairs (2)

TOTAL 69

Students transferring from a State of Florida junior college who have completed that institution's general education requirements, have fully satisfied FTU lower division Environmental Studies requirements. Upper division Environmental Studies courses are required of all students seeking a bachelor's degree at FTU.
MAJOR IN GENERAL STUDIES

PURPOSE

The General Studies curriculum is a university-wide general purpose program leading to the Bachelor of Arts in General Studies or Bachelor of Science in General Studies degree. The determination of whether the Arts or Science degree shall be awarded will be determined by the course areas selected.

The program is administered through the office of the Associate 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 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 a degree in General Studies must complete the Environmental Studies program*, four senior Seminars to include those from colleges not chosen in the course area groupings, and a minimum of 22 credits in each of five course areas. The five subject areas must be distributed over at least four colleges. At least 55 credits in these area groupings must be from courses numbered 300 and above. A minimum of 72 q.h. of the 183 required for graduation must be upper division level.

COURSE AREA GROUPINGS

ALLIED HEALTH SCIENCES
Allied Health Sciences, Inhalation Therapy, Medical Record Administration, Medical Technology, Nursing, and other Health Related Professions.

BEHAVIORAL SCIENCES
Anthropology, Psychology, Sociology, and Social Welfare.

BIOLOGICAL SCIENCES
Biology, Botany, Microbiology, and Zoology.

BUSINESS ADMINISTRATION
Accounting, Business Administration, Economics¹, Finance, Management, and Marketing.

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

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

ENGINEERING
Selected courses from any departmental offerings in the college, related courses from the engineering core and interdisciplinary grouping. (ENGR 481-489)

FINE ARTS
Art, Creative Writing, Music, and Theatre.

LANGUAGES
English, Foreign Languages.

*These courses may not be used to satisfy any of the five course area requirements.

¹This course shown in two areas.
HUMANITIES
History, Humanities, Philosophy and Religion.

MATHEMATICAL SCIENCES
Computer Science, Mathematics, and Statistics.

PHYSICAL SCIENCES
Astronomy, Chemistry, Geography (Physical), Geology, Physics, and general courses in the Earth and Space Sciences.

SOCIAL SCIENCES
Economics, Geography (Social), Law Enforcement, Political Science.

1This course shown in two areas.
COLLEGE OF
BUSINESS ADMINISTRATION

ACCOUNTANCY
BUSINESS ADMINISTRATION
ECONOMICS
FINANCE
MANAGEMENT
MARKETING
PRE-LAW

MASTER OF BUSINESS ADMINISTRATION
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

1. Environmental Studies Program
   - Basic (55)
   - Advanced (14)*
   Q.H. 69

2. Business Core
   Q.H. 50-53

3. Major Field of Concentration
   - Accountancy (33)
   - Business Administration (25-27)
   - Economics — General (29)
   - Finance (27)
   - Management (26)
   - Marketing (28-29)
   Q.H. 25-33

4. Electives (varies with major) 31-42

TOTAL QTR. HOURS REQUIRED 183

In addition to the 183 total hours required for graduation, one must satisfy the following break-down of the 183 hours to include:

90 hours at a senior institution
72 hours of 300-400 level courses
72 hours of course work offered by the College of Business Administration
72 hours of course work taken outside the College of Business Administration

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 45 to satisfy the Environmental Studies Program and include MATH 115 or MATH 221 in the mathematical science sequence and statistics 301. In addition, a student majoring in Marketing or Management must include PSY 201.

A student may select Economics 201 and any course from each of the disciplines, history and political science, to satisfy the Social Sciences requirement in the Social Environment area.

BUSINESS CORE (50-53)

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>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADM 101</td>
<td>4</td>
</tr>
<tr>
<td>ACCY 111, 112,</td>
<td>8/5</td>
</tr>
<tr>
<td>or 307</td>
<td></td>
</tr>
<tr>
<td>ECON 201, 202,</td>
<td>9</td>
</tr>
<tr>
<td>203</td>
<td></td>
</tr>
<tr>
<td>ENG 301</td>
<td>3</td>
</tr>
<tr>
<td>Business</td>
<td></td>
</tr>
<tr>
<td>Principles of Accountancy</td>
<td></td>
</tr>
<tr>
<td>Principles of Economics</td>
<td></td>
</tr>
<tr>
<td>Professional Report Writing</td>
<td></td>
</tr>
</tbody>
</table>
FIN 301  Finance  5
MGMT 301  Management  5
MKTG 301  Marketing  5
ECON 321  Business and Economic Statistics w/lab  4
BADM 371  Business Law  3
ECON 401  Managerial Economics  3
BADM 485  Business Policies  4

*ECON majors will take ECON 301 in lieu of ECON 401.

MAJOR (24-35)

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  Business Administration
Economics  Finance
Management  Marketing

ELECTIVE (25-40)

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

TOTAL (183)

MAJOR COURSE REQUIREMENTS

ACCOUNTANCY

Faculty:  Krebs  Bldg. GC 425, Phone 275-2116
          Busch, Bussman, Johnson, Wood

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  4
   ACCY 312  Intermediate Accounting  5
   ACCY 321  Cost Accounting  3
   ACCY 411  Advanced Accounting  3
   ACCY 412  Advanced Accounting  3
   ACCY 433  Auditing  3
   ACCY 451  Federal Income Tax Accounting  3
   ACCY 461  Computer Applications to Accounting  3

B. Elective: (Two Courses)
   ACCY 322  Cost Accounting  3
   ACCY 341  Governmental Accounting  3
   ACCY 413  Advanced Accounting  3
   ACCY 434  Auditing II  3
   ACCY 452  Federal Income Tax Accounting  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

Faculty:  Reidenbach  Bldg. GC 412, Phone 275-2619
          Gilliland, Hitt, Mahaffey, Mallue, T. Stone, Winchester
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 mathematical tools. A good foundation in mathematics and statistics is required of students 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 4

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 334 MKTG Models and Logistics 4
      MKTG 384 Marketing Research 5

C. Not more than 32 hours of credit in Business Administration beyond the college business core requirements may be counted in the 183 quarter hours required for graduation.

ECONOMICS

Faculty:  Hicks  Bldg. GC 405, Phone 275-2656
          Farah, Friday, Klages, Raffa, Towle, White

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 a variety of careers in business, industry, and government.

Although all of the economics courses are administered and offered by the College of Business Administration, a 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 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 in the College of Social Sciences section of this catalog.

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

GENERAL ECONOMICS

A. Required:
   - ECON 311 Intermediate Money, Income and Employment Theory 4
   - ECON 313 Public Finance in the American Economy 3
   - FIN 333 Money and Banking 4

B. Elective: (Six courses in economics not used elsewhere)
   All economics majors will be required to take six electives beyond the major required economic courses of 311, 431 and FIN 331.

C. Economics majors may have a concentration in any economics area offering sufficient courses including quantitative courses.

D. Not more than 32 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.

FINANCE

Faculty: Reiff Bldg. GC 404, Phone 275-2777
Budina, Millican

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 emphasizes 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:
- FIN 321 Investments 4
- FIN 331 Money and Banking 4
- FIN 411 Financial Institutions 4
- FIN 431 Financial Management 4

B. Elective: (Two courses from group 1 and one from group 2)
1. ECON 311 Intermediate Money, Income and Employment Theory 4
   - FIN 311 Risk and Insurance 4
   - FIN 341 Real Estate 4
   - FIN 421 Security Analysis 4
2. BADM 484 Operations Research 3
   - ECON 341 International Economics 3
   - ECON 431 Public Finance 3

C. Not more than 32 quarter hours of credit in Finance beyond the college business core requirement may be counted in the 183 quarter hours required for graduation.

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. They generally 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.

MANAGEMENT

Faculty: Comish Bldg. GC 411, Phone 275-2716
Berry, Jones, Martin, Newman, Nieb, Rellahan, J. Stone, Wilkinson, Wilson

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 is important to the study of management.

Organization theory focuses on the organization as a social system and the forces which affect this system, and includes
behavior of individuals in groups, economic conditions and
technology. Personnel management and industrial relations
are concerned primarily with the effective utilization of
human resources within the business organization.

The production manager specializes in the efficient utiliza­
tion 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 Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 324</td>
<td>Production Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 344</td>
<td>Organization Theory</td>
<td>5</td>
</tr>
<tr>
<td>MGMT 364</td>
<td>Personnel Management</td>
<td>5</td>
</tr>
<tr>
<td>BADM 484</td>
<td>Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>COM 311</td>
<td>Business and Professional Communication</td>
<td>4-3</td>
</tr>
</tbody>
</table>

B. Elective: (Two Courses)

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

C. Not more than 32 quarter hours of credit in Management beyond
the college business core requirement may be counted in the 183
quarter hours required for graduation.

MARKETING

Faculty: Teeple Bldg. GC 416, Phone 275-2115
Bondurant, Fuller, McAleer

Marketing encompasses the total system of interacting
business activities designed to plan, price, promote, and
distribute want-satisfying products and services to present
and potential customers.

The marketing curriculum concentrates on developing the
student's ability to understand, interpret, and measure
market demand; and to understand the blending of product
differentiation, pricing strategies, promotional strategies, and
physical distribution so as to optimize the efficiency of the
total system and the profits of the individual firm.

Students majoring in marketing find career opportunities in
the areas of advertising; sales promotion; sales management;
industrial sales; purchasing; marketing research; product
planning; physical distribution, and other related manage­
ment positions. This type of career opportunity may be
found in the manufacturing; transportation; communication;
public utility; wholesale trade; retail trade; finance; insur­
ance; real estate; construction; mining; agriculture; service
or other industries. Opportunities are also available in
education and government.

Course requirements for a major in Marketing are:

A. Required:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTG 326</td>
<td>Consumer Market Behavior</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 367</td>
<td>Sales Management</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 384</td>
<td>Marketing Research</td>
<td>5</td>
</tr>
<tr>
<td>MKTG 485</td>
<td>Marketing Policies and Strategies</td>
<td>4</td>
</tr>
</tbody>
</table>

B. Electives: (Minimum of 3 courses with a maximum of one in
PSY, COM area)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BADM 444</td>
<td>International Business Operations</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 334</td>
<td>Marketing Models and Logistics</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 364</td>
<td>Advertising Management</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 469</td>
<td>Channels of Distribution Management</td>
<td>4</td>
</tr>
<tr>
<td>MKTG 489</td>
<td>Current Marketing Problems</td>
<td>4</td>
</tr>
<tr>
<td>PSY 300,308,314</td>
<td></td>
<td>3-4</td>
</tr>
</tbody>
</table>

C. Not more than 32 quarter hours of credit in Marketing beyond
the college business core requirement may be counted in the 183
quarter hours required for graduation.

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 a recognized college or university with a 3.0 grade point average on all work attempted while registered as an upper division student and an acceptable score (ATGSB - 450) on the Admissions Test for Graduate Study in Business (ATGSB). Students who are deficient in one of these requirements may petition for special consideration. 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 and the ATGSB. The applicant’s intellectual development during the courses of his previous academic career, his extracurricular activities, employment experience, and other evidence of motivation for graduate study in business will also be considered.

The applicant will not be considered for regular graduate status until the score report for the Admission Test for Graduate Study in Business, 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 ATGSB and to direct the Educational Testing Service to mail the ATGSB score report to the Registrar and to the College of Business Administration at Florida Technological University. The ATGSB 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 at least three weeks in advance of each scheduled test date.

Foreign Students: Applicants from foreign countries whose native language is not English are required to submit scores on the Test of English as a Foreign Language (TOEFL) examination in addition to the ATGSB. The TOEFL and ATGSB are offered periodically at test centers throughout the world by the Educational Testing Service. The TOEFL Bulletin of Information for Candidates, International Edition and Registration Form are available at American embassies, consulates, offices of the United States Information Service or other U.S. government agencies abroad.

ENROLLMENT

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 accepted in the Master of Business Administration program as regular, provisional or post baccalaureate status. Students who apply too late to take the ATGSB may be permitted to register for prerequisite courses only. (An exception may be made for a student ranking in the upper 10% of his undergraduate class.) The University must have on file an application prior to registration for prerequisite courses.

PROGRAM OF STUDY

Prequisites for Graduate Programs

The following prerequisites or their equivalent must be completed before a student may enroll in graduate courses:
ACCY 111, 112; or 307 Basic or Accounting Concepts  
BADM 371 Business Law  
ECON 201, 202, 203 Principles of Economics  
STAT 301 Principles of Statistics (or Calculus)  
ECON 321 Business and Economic Statistics  
FIN 301 Finance  
MGMT 301 Management  
MKTG 301 Marketing

Prerequisites may be satisfied through credit by examination or through completion of similar courses within the past five (5) years at a recognized college or university.

Students completing their last preparatory course(s) may also register for graduate courses in the same quarter with the permission of the dean of the College of Business Administration.

Courses 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.

Graduate Courses

SUBJECT                          Q.H.

ACCY 601 Managerial Accounting 3  
BADM 601 Quantitative Analysis for Business Decisions 3  
BADM 621 Business Policy and Responsibility 3  
BADM 695 Business Research Methods 3  
ECON 601 Economics of the Firm 3  
ECON 611 Aggregate Economics—Income, Employment, and Growth 3  
ECON 621 Statistics for Business and Economic Analysis 3  
FIN 601 Capital Budgeting and Financial Planning 3  
FIN 611 Working Capital and Financial Problems 3  
MGMT 601 Management Process 3  
MGMT 611 Organizational Behavior 3  
MKTG 601 Marketing Policy 3

TOTAL CORE REQUIREMENTS 36  
Electives* 9  
TOTAL 45

*Each student will complete at least nine hours of approved electives from any 600 level offerings in Economics or Business Administration or from approved graduate courses in other colleges which may be open to them.

Thesis – Research Paper

No thesis is required for the M.B.A. degree. A student may petition to submit a research paper for three or six (3-6) hours of elective graduate credit. The research paper would be a critical and analytical review of the existing literature on an approved subject, or the statement, exposition, and resolution of a hypothesis in an area of Business Administration.

Comprehensive Examination

Satisfactory completion of a written comprehensive examination is required for the M.B.A. degree. The two hour examination on the major areas of study normally will be taken during the eighth week of the final quarter of course work.

RESIDENCE REQUIREMENTS

The Master of Business Administration degree may be earned by employed students who attend evening classes. A part-time student normally will be limited to two courses of study 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 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, if taken within the last five years. 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.
GENERAL INFORMATION

Additional information pertaining to the M.B.A. program is available in the graduate section of this bulletin. (See page 47).

CAPE KENNEDY COMPLEX MASTER'S PROGRAM

The following course work in management is limited to the program offered in the Cape Kennedy Complex.

FOUNDATION COURSES

BSA 500 Accounting Concepts: Introductory 5
BSA 503 Quantitative Methods 5
BSA 504 Financial Concepts of Management 5
BSA 505 Marketing Theory and Policy 5
BSA 506 Economic Concepts for Business Decisions 5
BSA 507 Management Concepts 5

REQUIRED GRADUATE COURSES

BSA 511 The Scientific Method in Business Research 5
BSA 512 Accounting Concepts for Managerial Control 5
BSA 513 Advanced Quantitative Methods 5
BSA 514 Business Conditions Analysis 5
BSA 515 Economic Analysis for Management 5
BSA 516 Problems in Policy Formulation 5
BSA 571 Marketing Concepts of Management 5

AREA OF CONCENTRATION COURSES

BSA 535 Studies in Operations Research 5
BSA 537 Simulation of Dynamics Systems 5
BSA 541 Problems in Financial Policy 5
BSA 550 Evolution of Administrative Management 5
BSA 551 Research Seminar in Organization Theory 5
BSA 552 Leadership and Administrative Behavior 5
BSA 553 Seminar in Labor Problems 5
BSA 554 Modern Developments in Systems Theory 5
BSA 556 Research and Development Management 5
BSA 597 Research or Problem Solving Terminal Paper 5
COLLEGE OF EDUCATION

ELEMENTARY

SECONDARY
  BIOLOGY
  BUSINESS EDUCATION
  CHEMISTRY
  ENGLISH LANGUAGE ARTS
  FOREIGN LANGUAGE
  MATHEMATICS
  PHYSICS
  SOCIAL SCIENCES
  SPEECH

COMPREHENSIVE (1-12)
  LIBRARY AND AUDIOVISUAL SERVICE
  MUSIC EDUCATION
  PHYSICAL EDUCATION
  VISUAL ARTS

MASTER OF EDUCATION
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 prestudent 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 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

Coordinator: Silloway Bldg. GC 309, Phone 275-2591

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:
Areas

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

2. Academic Specialization

3. Professional Preparation
   Phase I. Teaching Analysis and Human Development
   Phase II. Developmental - Elementary Developmental - Secondary
   Phase III. Teaching Strategies
   Student Teaching

4. Electives (20-34) (varies with major)

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

Chairman: Hernandez Bldg. GC 322, Phone 275-2426
Faculty: Barker, Barr-Johnson, Brown, Carr, Craig, Dziuban, Hoover, Kysilka, McLain, Wood

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 Phase I and II; have 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 must be submitted no later than October 1 for the Winter Quarter; January 15 for the Spring Quarter; and April 5 for the Fall Quarter.
ELEMEI'IAIARY EDUCATION

Chairman: Martin Bldg. GC 314, Phone 275-2161
Faculty: Anderson, Bird, Bunnell, Esler, Green, Haughee, Hynes, Merritt, Palmer, Poe, Thompson

The Elementary Education Program is 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 q.h. minimum); and (5) Electives (23 quarter hours).

REQUIRED ACADEMIC SPECIALIZATION COURSES

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

TOTAL 41

REQUIRED PROFESSIONAL PREPARATION COURSES

<table>
<thead>
<tr>
<th>Phase I – Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA 206 Human Development</td>
</tr>
<tr>
<td>EDTA 307 Teaching Analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase II – Developmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDEL 311 Basic Foundations of Reading</td>
</tr>
<tr>
<td>EDPL 320, 321 Student Teaching</td>
</tr>
<tr>
<td>EDTA 305 Principles of Evaluation</td>
</tr>
<tr>
<td>EDTA 306 Learning Theory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase III – Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDEL 316 Elementary School Curriculum</td>
</tr>
<tr>
<td>EDPL 421 Student Teaching</td>
</tr>
<tr>
<td>EDPL 408 Teaching Strategies</td>
</tr>
</tbody>
</table>

TOTAL 38

RELATED FIELD OF ACADEMIC CONCENTRATION

A minimum of 12 quarter hours is required in a related field of academic concentration such as the following: art, communication, early childhood education, English, French, Spanish, humanities, library science, mathematics, music, physical education, sciences, or social sciences.

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</th>
<th>Title</th>
<th>Q.H.</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>Language Arts in Early Childhood Education</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 404</td>
<td>Organization of Instruction in Nursery — Kindergarten Education</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL 9
PROFESSIONAL LABORATORY EXPERIENCE

Chairman: Rothberg Bldg. GC 323, Phone 275-2401
Faculty: Beadle, Harrow, McGee, Manning, Miller, Sullivan

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

Chairman: Hall Bldg. GC 333, Phone 275-2286
Faculty: Armstrong, Brumbaugh, Clarke, Gurney, Snellings, Weidenheimer, West, Wood

The Secondary Education Programs are designed for students interested in the development and education of adolescents. Upon graduation students majoring in Secondary Education are qualified to teach an academic subject(s) in grades seven through twelve and are eligible to receive a Florida Rank III Teacher’s Certificate. Areas of study required are: (1) Environmental Studies (69 quarter hours); (2) Professional Preparation (39-42 quarter hours); (3) Academic Specialization (54-66 quarter hours); and (4) Electives which vary according to major.

REQUIRED PROFESSIONAL PREPARATION COURSES Q.H.

Phase I—Analysis

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA 206</td>
<td>Human Development</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 307</td>
<td>Teaching Analysis</td>
<td>5</td>
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</table>

Phase II—Developmental

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDSE 303</td>
<td>School Programs*</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDSE 305</td>
<td>Secondary School Curriculum</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 310-380</td>
<td>Instructional Analysis</td>
<td>4-7</td>
</tr>
<tr>
<td>EDTA 305</td>
<td>Principles of Evaluation</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 306</td>
<td>Learning Theory</td>
<td>3</td>
</tr>
<tr>
<td>EDPL 330</td>
<td>Student Teaching</td>
<td>3</td>
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</table>

Phase III—Application

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Q.H.</th>
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</thead>
<tbody>
<tr>
<td>EDPL 430</td>
<td>Student Teaching</td>
<td>9</td>
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<tr>
<td>EDPL 408</td>
<td>Teaching Strategies</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 404</td>
<td>Instructional Techniques</td>
<td>3</td>
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</table>

TOTAL: 39-42

PROFESSIONAL LABORATORY EXPERIENCE

Chairman: Rothberg Bldg. GC 323, Phone 275-2401
Faculty: Beadle, Harrow, McGee, Manning, Miller, Sullivan

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. Students are 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 at the secondary level only are offered in biology, business education, chemistry, English, foreign languages, mathematics, physics, social sciences and

*For K-12 certification only.
speech. Specializations covering the complete kindergarten through high school are offered in physical education, library, music and visual arts.

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**

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 100</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 350</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 360</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 491</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 461</td>
<td>3</td>
</tr>
<tr>
<td>BOT 100</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 113</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 114</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>1</td>
</tr>
<tr>
<td>MICR 200</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 100</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 224</td>
<td>5</td>
</tr>
</tbody>
</table>

**GENERAL BIOLOGY ELECTIVES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 460</td>
<td>3</td>
</tr>
<tr>
<td>BOT 270</td>
<td>3</td>
</tr>
<tr>
<td>BOT 345</td>
<td>4</td>
</tr>
<tr>
<td>MICR 220</td>
<td>3</td>
</tr>
<tr>
<td>ZOOL 240</td>
<td>5</td>
</tr>
<tr>
<td>ZOOL 340</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 345</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 447</td>
<td>4</td>
</tr>
</tbody>
</table>

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**

Chairman: Miller  Bldg. GC 337, Phone 275-2376
Faculty:  Baab, Fowler

**Comprehensive Curriculum**

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 111,112</td>
<td>Basic Concepts (4, 4)</td>
</tr>
<tr>
<td>BADM 371</td>
<td>Business Law</td>
</tr>
<tr>
<td>ECON 203</td>
<td>Introduction to Aggregate Economics</td>
</tr>
<tr>
<td>EDBE 101</td>
<td>Introductory Typewriting (3)</td>
</tr>
<tr>
<td>EDBE 102,103</td>
<td>Communications Production I, II (3, 3)</td>
</tr>
<tr>
<td>EDBE 201,202,203</td>
<td>Principles of Shorthand I, II, III (3, 3, 3)</td>
</tr>
<tr>
<td>EDBE 301</td>
<td>Shorthand Dictation</td>
</tr>
<tr>
<td>EDBE 302</td>
<td>Shorthand Transcription</td>
</tr>
<tr>
<td>EDBE 305</td>
<td>Office Technology</td>
</tr>
<tr>
<td>EDBE 405</td>
<td>Principles of Business — Vocational Education</td>
</tr>
<tr>
<td>EDBE 406</td>
<td>Office Systems and Procedures</td>
</tr>
<tr>
<td>ENG 301</td>
<td>Professional Report Writing</td>
</tr>
</tbody>
</table>

**ELECTIVES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 460</td>
<td>3</td>
</tr>
<tr>
<td>BOT 270</td>
<td>3</td>
</tr>
<tr>
<td>BOT 345</td>
<td>4</td>
</tr>
<tr>
<td>MICR 220</td>
<td>3</td>
</tr>
<tr>
<td>ZOOL 240</td>
<td>5</td>
</tr>
<tr>
<td>ZOOL 340</td>
<td>4</td>
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<tr>
<td>ZOOL 345</td>
<td>4</td>
</tr>
<tr>
<td>ZOOL 447</td>
<td>4</td>
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</table>

**ELECTIVES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 111,112</td>
<td>Basic Concepts (4, 4)</td>
</tr>
<tr>
<td>ACCY 311,312</td>
<td>Intermediate Accounting (4, 4)</td>
</tr>
<tr>
<td>BADM 371</td>
<td>Business Law</td>
</tr>
<tr>
<td>ECON 203</td>
<td>Introduction to Aggregate Economics</td>
</tr>
<tr>
<td>ECON 411</td>
<td>Comparative Economic Systems</td>
</tr>
<tr>
<td>EDBE 101</td>
<td>Introductory Typewriting (3)</td>
</tr>
<tr>
<td>EDBE 102,103</td>
<td>Communications Production I, II (3, 3)</td>
</tr>
<tr>
<td>EDBE 305</td>
<td>Office Technology</td>
</tr>
</tbody>
</table>

1ECON 201, 202 are prerequisites.
2May be exempted, but Business Administration courses must be selected as replacements for courses exempted.
3Excludes courses in and related to shorthand instruction.
4May be exempted, but Business Administration courses must be selected as replacements.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDBE 405</td>
<td>Principles of Business — Vocational Education</td>
<td>3</td>
</tr>
<tr>
<td>ENG 301</td>
<td>Professional Report Writing</td>
<td>3</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Management</td>
<td>5</td>
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<tr>
<td>MKTG 301</td>
<td>Marketing</td>
<td>5</td>
</tr>
<tr>
<td>ELECTIVES</td>
<td></td>
<td>19</td>
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</tbody>
</table>

### CHEMISTRY SPECIALIZATION

**CHEMISTRY REQUIREMENTS (40)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121, 122, 123</td>
<td>Organic Chemistry (4, 3, 3)</td>
<td>10</td>
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<tr>
<td>CHEM 124</td>
<td>Organic Laboratory Techniques</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 161, 162, 163</td>
<td>Chemical Principles (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 351, 352</td>
<td>Analytical Laboratory Techniques (3, 3)</td>
<td>6</td>
</tr>
<tr>
<td>EDSE 462, 463</td>
<td>Chemistry Laboratory Teaching (2, 2)</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 300-400</td>
<td>Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

### MATHEMATICS REQUIREMENTS (23)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 110, 111</td>
<td>Precalculus Mathematics (4, 4)</td>
<td>8</td>
</tr>
<tr>
<td>MATH 211</td>
<td>Analytic Geometry (3)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 221, 222, 223</td>
<td>Calculus (4, 4, 4)</td>
<td>12</td>
</tr>
<tr>
<td>ELECTIVES</td>
<td></td>
<td>24</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.

### ENGLISH LANGUAGE ARTS SPECIALIZATION

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 101, 102, 103</td>
<td>Composition (3, 3)</td>
<td>6</td>
</tr>
<tr>
<td>ENG 208</td>
<td>Principles of Creative Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENG 300</td>
<td>Expository Writing</td>
<td>3</td>
</tr>
<tr>
<td>EDSE 440</td>
<td>Teaching Language and Composition</td>
<td>3</td>
</tr>
</tbody>
</table>

### FOREIGN LANGUAGE SPECIALIZATION — FRENCH

**BASIC COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRE 101, 102, 103</td>
<td>Elementary French Language and Civilization (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>FRE 201, 202, 203</td>
<td>Intermediate French Language and Civilization (3, 3, 3)</td>
<td>9</td>
</tr>
</tbody>
</table>

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRE 301</td>
<td>French Composition</td>
<td>4</td>
</tr>
<tr>
<td>FRE 303</td>
<td>French Conversation</td>
<td>4</td>
</tr>
<tr>
<td>FRE 311, 312, 313</td>
<td>Survey of French Literature (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>FRE 401</td>
<td>French Phonetics and Diction</td>
<td>2</td>
</tr>
</tbody>
</table>

1Credit must be earned in Biochemistry.

1May be exempted.
Certification in a second language may be completed by taking 27 quarter hours in that language including the requirements for French.

**FOREIGN LANGUAGE SPECIALIZATION – SPANISH**

1. **BASIC COURSES**
   
   **SPA 101, 102, 103**
   Elementary Spanish Language and Civilization (3, 3, 3)
   
   **SPA 201, 202, 203**
   Intermediate Spanish Language and Civilization (3, 3, 3)

   **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
   
   **EDSE 320**
   Language as Human Behavior 3
   
   **ELECTIVES**
   23

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

**MATHEMATICS SPECIALIZATION**

1. **REQUIRED COURSES**
   
   **COMP 102**
   Computer Programming 3
   
   **MATH 110**
   Precalculus Mathematics 4
   
   **MATH 111**
   Precalculus Mathematics 4
   
   **MATH 115**
   Finite Mathematics 4
   
   **MATH 211**
   Analytic Geometry 3
   
   **MATH 221, 222, 223**
   Calculus (4, 4, 4) 12
   
   **MATH 315**
   Introduction to Number Theory 3

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

**SOCIAL SCIENCES SPECIALIZATION**

1. **REQUIRED COURSES**
   
   **ECON 201**
   Principles of Economics 3
   
   **HIST 201, 202, 203**
   Western Culture and Civilization (4, 4, 4) 12
   
   **HIST 311, 312, 313**
   American History (4, 4, 4) 12

   Certification in Social Sciences may also be completed by taking a total of 18 quarter hours in Social Sciences including the requirements for Humanities.

---

1 May be exempted. See Student Placement, page 89.

2 May be exempted.
Students must have additional credits in history, political science and sociology with at least 20 credits in one area. A list of recommended courses is available from the Department of Secondary Education. Students may select courses which emphasize Junior or Senior High subject areas.

**ELECTIVES**

**SPEECH SPECIALIZATION**

**REQUIRED COURSES**  
(54 Q.H.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 100</td>
<td>Basic Communications</td>
<td>3</td>
</tr>
<tr>
<td>COM 301</td>
<td>Communications as a Behavioral Science</td>
<td>4</td>
</tr>
<tr>
<td>COM 363</td>
<td>Group Interaction and Decision Making</td>
<td>4</td>
</tr>
<tr>
<td>COM 463</td>
<td>Studies in Listening</td>
<td>4</td>
</tr>
<tr>
<td>SPE 101</td>
<td>Fundamentals of Oral Communications</td>
<td>3</td>
</tr>
<tr>
<td>SPE 261</td>
<td>English Phonetics and American Dialects</td>
<td>5</td>
</tr>
<tr>
<td>SPE 360</td>
<td>Argumentation and Debate</td>
<td>4</td>
</tr>
<tr>
<td>SPE 362</td>
<td>Platform Speaking</td>
<td>4</td>
</tr>
<tr>
<td>SPE 366</td>
<td>Speech Composition</td>
<td>4</td>
</tr>
<tr>
<td>SPE 469</td>
<td>Survey: Language and Speech Problems</td>
<td>4</td>
</tr>
<tr>
<td>SPE 473</td>
<td>Directing Extracurricular Activities</td>
<td>3</td>
</tr>
</tbody>
</table>

**DISCIPLINE SPECIALIZATION (select one)**  
(12 or 13 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THA 230</td>
<td>Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>THA 280</td>
<td>Introduction to Acting</td>
<td>4</td>
</tr>
<tr>
<td>THA 380</td>
<td>Directing</td>
<td>3</td>
</tr>
<tr>
<td>THA 422</td>
<td>High School Play Directing</td>
<td>3</td>
</tr>
</tbody>
</table>

**Journalism**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>JRN 321</td>
<td>Copy Editing</td>
<td>4</td>
</tr>
<tr>
<td>JRN 322</td>
<td>Information Processing</td>
<td>4</td>
</tr>
<tr>
<td>JRN 420</td>
<td>News Writing</td>
<td>4</td>
</tr>
<tr>
<td>JRN 300-400</td>
<td>Electives</td>
<td>4</td>
</tr>
</tbody>
</table>

**Speech Pathology**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE 340</td>
<td>Problems of Articulation</td>
<td>4</td>
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<tr>
<td>SPE 364</td>
<td>Physical Bases of Speech and Hearing</td>
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<tr>
<td>PSY 333</td>
<td>Development of Language</td>
<td>4</td>
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</tbody>
</table>

**ELECTIVES**

**COMPREHENSIVE (1-12)**

**LIBRARY AND AUDIOVISUAL SERVICE SPECIALIZATION**

**REQUIRED COURSES**  
(36 Q.H.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>EDEL 307</td>
<td>Literature for Children</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 301</td>
<td>Library Materials</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 321</td>
<td>Library Organization and Administration I</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 322</td>
<td>Library Organization and Administration II</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 424</td>
<td>School Library Administration</td>
<td>3</td>
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<tr>
<td>EDLS 431</td>
<td>Cataloging and Classification I</td>
<td>4</td>
</tr>
<tr>
<td>EDLS 444</td>
<td>Reference Materials and Services</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 451</td>
<td>Introduction to Educational Media</td>
<td>4</td>
</tr>
<tr>
<td>EDSE 441</td>
<td>Literature for Adolescents</td>
<td>3</td>
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</table>

**SELECT SEVEN CREDITS FROM:**

<table>
<thead>
<tr>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDLS 334</td>
<td>Selection and Acquisitions of Library Materials</td>
<td>4</td>
</tr>
<tr>
<td>EDLS 384</td>
<td>History of Books and Libraries</td>
<td>3</td>
</tr>
<tr>
<td>EDLS 432</td>
<td>Cataloging and Classification II</td>
<td>4</td>
</tr>
<tr>
<td>EDLS 452</td>
<td>Preparation and Production of Instructional Media</td>
<td>3</td>
</tr>
<tr>
<td>EDEL 407</td>
<td>Classroom Diagnosis and Treatment of Reading Difficulties</td>
<td>3</td>
</tr>
</tbody>
</table>

1Teacher education majors (elementary or secondary) may add Library and Audiovisual Services certification to the Rank III certificate by successful completion of the courses prescribed in this area.
MUSIC EDUCATION SPECIALIZATION

REQUIRED COURSES

(65 Q.H.)

Theory
- MUS 101, 102, 103 Music Theory (3, 3, 3)
- MUS 201, 202, 203 Music Theory (3, 3, 3)
- MUS 301 Counterpoint
- MUS 401 Form and Analysis

History and Literature
- MUS 104, 105, 106 Music Literature (2, 2, 2)

Applied
- MUS 351, 352 Conducting (2, 2)

Select Four:
- MUS 204 Voice Class
- MUS 205 String Class
- MUS 206 Woodwind Class
- MUS 207 Brass Class
- MUS 208 Percussion Class

Ensemble
- Students are required to take ensemble each quarter except during senior year student teaching.

Major
- Students select a concentration in applied instruments or voice.

All music Education Majors must pass a piano proficiency examination. In addition, all students are expected to perform a faculty approved half-recital.

ELECTIVES

PHYSICAL EDUCATION

Chairman: Rohter  Bldg. GC 340, Phone 275-2256
Faculty: Clark, Cleland, Gergley, Hunter, Patterson, Powell, Renner, Salerno

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, 45 quarter hours; (3) area of specialization, 46 quarter hours; and (4) Electives, 24 quarter hours.

PHYSICAL EDUCATION SPECIALIZATION

(52 Q.H.)

- ZOOL 234 Anatomy and Physiology
- EDPE 323 Instructional Analysis of Team Sports
- EDPE 324 Instructional Analysis of Tennis
- EDPE 325 Instructional Analysis of Aquatics
- EDPE 326 Instructional Analysis of Gymnastics and Tumbling
- EDPE 327 Instructional Analysis of Golf
- EDPE 328 Instructional Analysis of Wrestling
- EDPE 329 Choreography of Contemporary Dance
- EDPE 330 Instructional Analysis of Rhythms
- EDPE 350 Coaching Theory
- EDPE 360 School and Community Recreation
- EDPE 410 Kinesiomechanics
- EDPE 421 Exercise Physiology - Cardiovascular
- EDPE 422 Exercise Physiology - Respiratory
- EDPE 430 Human Performance Learning
- EDPE 440 Rehabilitation Training Techniques
- EDPE 450 Organization and Administration of Physical Education

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 Teacher Education Centers during two quarters (one quarter on an elementary level, one quarter on a secondary level) of their junior year; the courses listed in Phase II - Developmental, will be scheduled concurrently. In Phase III (senior year), 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: (17-18 Q.H.)

EDPE 407 Family Living Concepts 5
EDPE 408 Contemporary Health Hazards 5
MICR 200 General Microbiology 3
MICR 201 General Microbiology Laboratory 1

One of the Following:
CEES 417 Environmental Health 4
MICR 220 Sanitary Sciences and Public Health 3

VISUAL ARTS SPECIALIZATION

REQUIRED COURSES (58 Q.H.)

Production
ART 201, 202, 203 Design Fundamentals (3, 3, 3) 9
ART 211 Drawing Fundamentals 3
ART 302 Graphic Design 3
ART 311 Intermediate Drawing 3
ART 351 Painting 3
ART 371 Sculpture 3
ART 381 Ceramics 3

Criticism
ART 231 Visual Arts Overview 3
ART 433 Theory and Criticism of the Visual Arts 3
HUM 421 Purposes of Art 4

Curriculum
EDVA 431 Two-Dimensional Instructional Materials 3
EDVA 432 Three-Dimensional Instructional Materials 3
EDVA 433 Graphic Instructional Materials 3

Discipline Specialization (12 Q.H.)

Twelve credits are selected from Art or a related area. Specialization in Architecture, Art History, Design, Graphics, Humanities, Painting, Photography or Sculpture may be selected.

ELECTIVES 15

EDVA 501 Contemporary Visual Arts Education and EDVA 502 Found Arts are recommended electives.

MASTER OF EDUCATION DEGREE

Coordinator: Cowgill Bldg. GC 206, Phone 275-2366

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, they meet the Florida Rank II Certification Teaching Specialization requirements. 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. Specializations are available in Business Education, Elementary Education (including Reading Specialization), Physical Education, and Secondary Education. At this time, no programs will be offered for certification in specialized areas such as guidance and counseling or administration and supervision.

ADMISSION REQUIREMENTS

To meet basic requirements for admission to the Master of Education degree program a student must have:

1. A bachelor's degree.
2. The basic course requirements for a regular Rank III Florida Teaching Certificate.
3. Test score results submitted from the aptitude sections of the Graduate Record Examination (GRE). In order that admission decisions can be completed the GRE must be taken and submitted prior to enrollment in the graduate program. Information concerning application for and admission to the GRE can be secured from the Director of Developmental Center.

Categories of admission are as follows:
1. Regular:
Students with a “B” average or better on all work attempted while registered as an upper division student working for a baccalaureate degree.

OR

Have a total quantitative-verbal score of 1000 on the Graduate Record Examination (GRE).

2. Provisional:
A limited admission category, subject to approval by the Dean of the College, for students falling short of the requirements for regular admission. After the successful completion of 12 quarter hours of graduate work in this category, students may be admitted to regular status in the M.Ed. program. Provisional status will not be extended beyond 12 hours.

3. Post Baccalaureate:
A student admitted to take graduate courses without being accepted to a formal graduate program leading to a degree at FTU.

A student applying to change from the post-baccalaureate category to some other graduate admission category will be subject to the admission regulations of the category to which he wishes to change. A limited number of hours taken as a post-baccalaureate student may be utilized with the approval of the student’s graduate program adviser.

Because of the limited graduate student quotas established by the Board of Regents in Regular and Provisional categories, there is no guarantee that a student will be admitted to the Master of Education degree program.

PLANNED PROGRAM

Each graduate student is assigned a graduate adviser from the area which offers the program of his selected specialization. Degree programs must be planned by the student and his adviser 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 of 45 quarter hours required for a planned degree program, 18 may be taken through Continuing Education. Ordinarily, no more than 9 quarter hours of “B” or better work may be transferred from an institution outside the Florida State University System. A combination of transfer and continuing education credit cannot exceed 18 quarter hours.

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 tests of the Graduate Record Examination. Applications for Admission to Candidacy are available in the office of the Coordinator of Advanced Studies, 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 adviser where prerequisites are necessary, and/or course deficiencies are apparent. A “B” (3.0) average must be maintained in all graduate courses. Not more than 9 hours of “C” may be counted toward the degree.

GRADUATE STUDENT LOAD-MAXIMUM

A graduate student who is enrolled in 15 quarter hours of graduate level course work is considered to be carrying a maximum graduate academic load. Twelve (12) quarter hours is considered a usual load. For abbreviated terms, such as summer terms, the maximum load will be less than 12 quarter hours.
RESEARCH REPORT

After completing Fundamental Research Procedures in Education (EDTA 601), a student will design and implement a classroom study project or other type research paper. The project will be planned and approved in Research Planning (EDBE, EDEL, EDPE, or EDSE 696). Once the project has been carried out, credit will be granted through Research Report (EDBE, EDEL, EDPE, or EDSE 698). A copy of the approved report must be submitted to the Office of Advanced Studies, College of Education before the student's expected graduation date.
COLLEGE OF ENGINEERING

CIVIL ENGINEERING AND ENVIRONMENTAL SCIENCES
ELECTRICAL ENGINEERING AND COMMUNICATION SCIENCES
ENGINEERING MATHEMATICS AND COMPUTER SYSTEMS
ENGINEERING MECHANICS AND MATERIALS SCIENCES
INDUSTRIAL ENGINEERING AND MANAGEMENT SYSTEMS
MECHANICAL ENGINEERING AND AEROSPACE SCIENCES
The Engineering curriculum at Florida Technological University is directed toward professional objectives. These objectives are best met by completing the bachelor's degree program followed by additional 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 core curriculum, and both required and elective courses of study in a selected area of concentration (option) of the student's choice, leads to the degree of Bachelor of Science in Engineering. 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 degree. The most common deficiencies that must be removed before beginning regular engineering 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 program. 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. Typically, students who have completed the A.A. degree with calculus, chemistry, physics, engineering graphics, and a course in computer science (with FORTRAN) can complete the B.S.E. program in two additional years. 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 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 2.0 grade point average (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
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 study in the engineering curriculum are devoted to the basic sciences, mathematics and the fundamentals of engineering problem solving. 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
   Basic (55)
   Advanced (14)

2. Engineering Core
   96

3. Additional Option Courses and Technical Electives
   27

TOTAL QTR. HOURS REQUIRED
192

Technical electives within a chosen option 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, or business administration.

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.

SUBJECTS

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>ENGR 101</td>
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<tr>
<td>ENGR 332</td>
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Q.H.

Includes scientific requirements of the Environmental Studies Program.
### TYPICAL BSE PROGRAM

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<tr>
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<tbody>
<tr>
<td>ENGR 341</td>
<td>Engineering Economic Analysis</td>
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</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 Engineers</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>or</td>
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<tr>
<td>ENGR 310</td>
<td>Professional Report Writing</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>
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#### First Year

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<tr>
<td>COMP 102</td>
<td>Computer Programming</td>
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<tr>
<td>ENG 101</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101, 103</td>
<td>Engineering Graphics; Creative Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 111</td>
<td>Engineering Concepts</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 151, 152</td>
<td>Chemical Foundations of Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 211, 221, 222</td>
<td>Analytic Geometry and Calculus</td>
<td>3</td>
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<tr>
<td>Social Environment Courses</td>
<td>3</td>
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<tr>
<td>SPE 101</td>
<td>Fundamentals of Oral Communication</td>
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</tr>
<tr>
<td>ENGR 201</td>
<td>Engineering Design Case Studies</td>
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#### Second Year

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<tbody>
<tr>
<td>ENGR 211, 311, 312</td>
<td>Engineering Analysis – Statics; Dynamics; Mechanics of Materials</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 221</td>
<td>Electrical Science</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 321</td>
<td>Principles of Electrical Engineering</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>
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</tr>
<tr>
<td>ENGR 371</td>
<td>Probability and Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>MATH 223, 321, 331</td>
<td>Calculus; Intermediate Calculus; and Differential Equations</td>
<td>4</td>
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<tr>
<td>Social Environment Courses to include ECON 201</td>
<td>6</td>
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#### Third Year

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<tbody>
<tr>
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<td>Electronic Engineering, Electrical Devices and Systems</td>
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<tr>
<td>ENGR 331, 332, 431</td>
<td>Thermodynamics; Fluid Mechanics; Transport Processes</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 342, 441</td>
<td>Systems Analysis; Technical Communications</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 351, 352</td>
<td>Structure and Properties of Materials; Materials of Engineering</td>
<td>3</td>
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<tr>
<td>Option and Technical Electives</td>
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<tr>
<td>Humanities</td>
<td>4</td>
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#### Fourth Year

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<th>Course Title</th>
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<tbody>
<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>
<tr>
<td>PHYS 344</td>
<td>Modern Physics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>Option and Technical Electives</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Environmental Studies – Advanced Subjects</td>
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<tr>
<td>Senior Seminar</td>
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<td>2</td>
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<tr>
<td>Environmental Studies – Electives</td>
<td>2</td>
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</tr>
</tbody>
</table>

#### ACADEMIC OPTIONS

Students in the B.S.E. program may elect an option in one of the departments of the College of Engineering. Each option permits the student to build a professional specialization on the unified engineering core and environmental studies requirements. In the development of this concept, the student is enabled to implement a well-rounded, broad-based, approach to engineering problem solutions within the framework of a professional specialization.

#### CIVIL ENGINEERING AND ENVIRONMENTAL SCIENCES

**Chairman:** McLellon  Bldg. EN 415, Phone 275-2841  
**Faculty:** Hartman, Kersten, McEwan, Myrick, Wanielista, Ward, Yousef
The Department of Civil Engineering and Environmental Sciences offers an option in Environmental Engineering. This option is concerned primarily with the interaction of man and his environment, and the planning, design and control of systems for environmental quality management.

A program of study is available within this option which enables the student to pursue an integrated series or sequence of courses in the major field which includes not only basic and fundamental courses but specialized courses as well in the fields of environmental engineering, transportation engineering, urban systems engineering, water resources engineering and related courses in structural engineering, soil mechanics, and engineering geology. These specialized courses reflect the contemporary developments and trends in systems analysis, environmental quality management, man-environment interaction as well as several of the traditional areas of civil engineering.

Environmental engineers are responsible for research, development, planning, design and construction of the structures and processes that form the basis of our modern civilization. The Environmental Engineering option encompasses water and atmospheric resources, waste treatment and pollution control, urban planning and engineering aspects of environmental health and natural resources.

The following courses are recommended for all students electing to pursue an option in Environmental Engineering:

**SUBJECTS**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*ENGR 341 Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 342 Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 361 Man and His Environment</td>
<td>3</td>
</tr>
<tr>
<td>CEES 411 Environmental Engineering — Water Supply</td>
<td>4</td>
</tr>
<tr>
<td>CEES 412 Environmental Engineering — Wastewater</td>
<td>4</td>
</tr>
<tr>
<td>CEES 414 Water and Wastewater Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 431 Transport Processes</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 443 Engineering Administration</td>
<td>3</td>
</tr>
<tr>
<td>CEES 501 Environmental Engineering — Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CEES 502 Environmental Engineering — Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td><strong>General Electives</strong></td>
<td></td>
</tr>
<tr>
<td>Technical Electives</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>46</td>
</tr>
</tbody>
</table>

*Included in Engineering Core
**Must meet ESP requirements also

**ELECTRICAL ENGINEERING AND COMMUNICATION SCIENCES**

Chairman: Mathews  Bldg. EN 315, Phone 275-2786
Faculty: Erickson, McCarter, Patz, Phillips, Towle

Electrical Engineers are primarily concerned with the development and utilization of devices and systems which are based on electrical phenomena. The range of application
includes computer systems, electronics, control systems, electrical power utilization, communication systems, medical instrumentation, etc. The electrical engineer can find professional challenges in virtually every facet of modern technology.

The option in Electrical Engineering is designed to present the basic electrical engineering principles which are common to this broad spectrum of application. In addition, courses are offered which present in-depth studies of specific electrical engineering subdisciplines such as analog and digital computer systems, electrical networks and electronics, electromagnetic fields and microwaves, electromechanics and control, power transmission and utilization, communication and information theory, and solid state systems and devices.

Many modern scientific developments are either essentially electrical in character or depend on electrical equipment and technique. Electrical Engineering graduates will find a broad employment opportunity in the field since it enters into much of industry and service where power is utilized, intelligence transmitted, and control exercised over physical, chemical, or mechanical operations.

The following courses are recommended for all students electing to pursue an option in Electrical Engineering:

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECS 321 Electrical Networks</td>
<td>4</td>
</tr>
<tr>
<td>EECS 322 Electronic Engineering</td>
<td>4</td>
</tr>
<tr>
<td>*ENGR 323 Electrical Devices and Systems</td>
<td>4</td>
</tr>
<tr>
<td>EECS 341 Electromagnetic Fields</td>
<td>4</td>
</tr>
<tr>
<td>*ENGR 342 Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 352 Materials of Engineering</td>
<td>3</td>
</tr>
<tr>
<td>*PHYS 354 Optics and Wave Motion for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 371 Probability and Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>EECS 411 Logical Component Design</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 421 Linear Control Systems</td>
<td>4</td>
</tr>
<tr>
<td>**General Electives</td>
<td>4</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>47</td>
</tr>
</tbody>
</table>

*Included in Engineering Core.

**Must meet ESP requirements also.

ENGINEERING MATHEMATICS AND COMPUTER SYSTEMS

(Students interested in this program should consult Dr. Schrader of the IEMS Department)

In contemporary professional engineering practice, and in research and development activities there is an increasing need for engineers with a high degree of training and capability in the application of mathematics and computers to the modeling, simulation and solution of complex technical problems. Many of our modern industries and governmental organizations are involved in the design and analysis of highly complex equipments and systems often requiring rigorous mathematical treatment which can only be carried out effectively through the use of modern, high speed, digital/analog/hybrid computer facilities. The computer has become an indispensable partner to the aerospace systems designer, the microwave circuit designer, the environmental systems analyst, the industrial manager, and many other professional engineering oriented activities. Thus, students majoring in Engineering Mathematics and Computer Systems will enjoy a broad spectrum of challenging opportunities.

The undergraduate engineering option in Engineering Mathematics and Computer Systems at Florida Technological University is inter-disciplinary and allows considerable flexibility in tailoring programs to fit individual student interest. Requirements for the major are fulfilled by completing twenty-seven (27) quarter credit hours of course work in the EMCS or related subject matter along with the engineering core and environmental studies requirements.

The following courses are recommended for all students electing to pursue this option:

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*MATH 331 Differential Equations</td>
<td>4</td>
</tr>
<tr>
<td>*ENGR 342 Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 371 Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 442 Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 443 Engineering Administration</td>
<td>3</td>
</tr>
<tr>
<td>**General Electives</td>
<td>4</td>
</tr>
</tbody>
</table>

*Included in Engineering Core.
EMCS 431 Numerical Methods in Scientific Computation I 3  
EMCS 471 Engineering Mathematical Analysis 3  
EECS 414 Analog Computers 3  
IEMS 431 Engineering Applications of Computer Methods 3  
IEMS 447 Numerical Methods in Systems Analysis 3  
**General Electives 4  
Technical Electives 12  
TOTAL 47  

**Must meet ESP requirements also.

ENGINEERING MECHANICS AND MATERIALS SCIENCES

Chairman: Jenkins  Bldg. EN 118, Phone 275-2268  
Faculty: Baldwin, Block, Carroll, Goldstein, Smith

Engineers in the field of materials science are instrumental in providing the materials (metals, polymers, ceramic, concrete, composites) which make it possible to build the structures, machines, public works, transportation systems, energy conversion systems, space craft and industrial products conceived by their engineering colleagues. The Materials Engineer has technical expertise in both the properties of materials and the reasons why materials have these properties. In addition he may be involved in developing new materials or in the reuse and recycling, or improvement of existing materials.

The option in Materials Engineering, which is the departmental emphasis at the undergraduate level, encompasses the principal areas of importance in this very broad field. These areas are the structure and properties of engineering materials, materials engineering, metallurgy, micromechanics, and composite materials. It should be noted that much of the field of materials science is involved with experimental activity and the curriculum includes appreciable experimental work.

Innovative use of materials is essential in every engineering system from the simplest to the most sophisticated. Consequently, our highly industrialized society will continue to demand increasing numbers of engineers competent in materials science. Graduates may find employment in a wide range of activities from producers of metals, ceramics, and polymers to industries producing computers and semiconductor devices, dental materials and medical appliances, to a host of items fabricated from plastics and in the newly emerging field of recycling of materials resources. In these activities, materials engineers may be found in research, development, operations, or design functions.

The following courses are recommended for all students electing to pursue an option in Materials Engineering:

**SUBJECT**  Q.H.
*ENGR 342 Systems Analysis 3  
*PHYS 344 Modern Physics for Engineers 3  
*ENGR 352 Materials of Engineering 3  
*ENGR 371 Probability and Statistics for Engineers 3  
EMMS 413 Thermodynamic Properties of Materials 3  
EMMS 414 Mechanical Properties of Materials 3  
EMMS 421 Theory of Crystalline Solids 3  
EMMS 430 Structure and Properties of Alloys 3  
*ENGR 431 Transport Processes 3  
EMMS 433 Physical Metallurgy 3  
EMMS 435 Structure and Properties of Ceramics and Polymers 3  
**General Electives 4  
Technical Electives 9  
TOTAL 46

*Included in Engineering Core.  
**Must meet ESP requirements also.

INDUSTRIAL ENGINEERING AND MANAGEMENT SYSTEMS

Chairman: Schrader  Bldg. EN 412, Phone 275-2236  
Faculty: Bauer, Clapp, Dennis, Gambrell, Lindenberg

The option in Industrial Engineering is concerned principally with the design, improvement, and installation of integrated systems of men, materials, and equipment for operations through the application of the principles of the engineering, mathematical, physical, and behavioral sciences.
A program of study is available within this option which enables the student to pursue an integrated series or sequence of courses in the major field which includes not only basic and fundamental courses but specialized courses as well, in the fields of management standards development, production and inventory control, project management, work analysis and design, management information systems, computer simulation, operations research, industrial facilities planning and design, and human engineering. These specialized courses reflect the contemporary developments and trends in operations research, information processing, and automation, and considerable course work involves use of the digital computer.

There is a growing tendency on the part of industry, government and institutions to select engineering personnel for managerial positions. Because of this the IEMS courses are oriented to systems management principles and concepts so as to enable the Industrial Engineering and Management Systems graduate to accept and succeed in these opportunities.

The following courses are recommended for all students electing to pursue an option in Industrial Engineering:

**SUBJECTS**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEMS 301 Management Standards</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 341 Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 342 Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 371 Probability and Statistics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 424 Management Control Systems I</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 442 Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>*ENGR 443 Engineering Administration</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 461 Human Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 432 System Simulation with Digital Computers</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 532 Management Information Systems l</td>
<td>4</td>
</tr>
<tr>
<td>IEMS 414 Industrial Facilities Planning and Design</td>
<td>3</td>
</tr>
<tr>
<td><strong>General Electives</strong></td>
<td></td>
</tr>
<tr>
<td>Technical Electives</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>46</td>
</tr>
</tbody>
</table>

*Included in Engineering Core.

**Must meet ESP requirements also.

---

**MECHANICAL ENGINEERING AND AEROSPACE SCIENCES**

Chairman: Evans Bldg. EN 115, Phone 275-2416
Faculty: Beck, Edwards, Nimmo, Rapson, Ventre, Wall

The Department of Mechanical Engineering and Aerospace Sciences is primarily concerned with dynamic physical systems such as transportation, production and energy conversion. Because such systems involve an energy source, the mechanical or aerospace engineer is concerned with the application of the basic laws of the engineering sciences to the conversion, transfer and control of the energy. When dealing with problems of this nature, the engineer must consider the economic constraints and the social implications of the solutions which he proposes.

The Mechanical Engineering option provides the student with the opportunity to pursue his educational objectives within the framework of this broad theme. Primary emphasis is given to the departmental subdisciplines of aerospace sciences, flight vehicle structures, measurement systems engineering, mechanical systems design and control, energy conversion and power systems, and thermal sciences.

The program is specifically designed to give the student a broad-based undergraduate engineering science program in order that he will have sufficient knowledge to converse with specialists in other fields of engineering and to analyze on his own the more basic problems in these fields. By judiciously selecting courses from the departmental subdisciplines, a firm foundation is laid in order that the student will obtain the theoretical tools and the design methodology to successfully pursue a career in the mechanical or aerospace engineering professions.

The following courses are recommended for all students electing to pursue an option in Mechanical Engineering:
SUBJECTS

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 323</td>
<td>4</td>
</tr>
<tr>
<td>MEAS 341</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 342</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 342</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 351</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 352</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 371</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 423</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 431</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 482</td>
<td>4</td>
</tr>
<tr>
<td>General Electives</td>
<td></td>
</tr>
<tr>
<td>Technical Electives</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
</tr>
</tbody>
</table>

* Included in Engineering Core
** Must meet ESP requirements also.

INTERDISCIPLINARY PROGRAMS

It is the desire of the College of Engineering to provide interdisciplinary programs 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 under development include:

- Biomedical Engineering
- Engineering Chemistry
- Engineering Design
- Engineering Operations
- Engineering Physics
- History of Engineering and Technology
- Public Systems Analysis
- Systems Engineering

GRADUATE PROGRAM

The College of Engineering offers graduate work leading to the Master of Science in Engineering, Master of Science, or Master of Science in Environmental Systems Management degrees. The programs are designed to provide for advanced professional engineering education (M.S.E.) or specialized education in selected areas (M.S. or M.S.E.S.M.).

Interested students should review information relative to admissions requirements presented in the Graduate Studies section of the catalog. An early contact with the appropriate department chairman is advisable to assist the student with an orderly and effective program of study. Each of the six departments in the college are cooperating in the graduate program activity.

DEGREE REQUIREMENTS

MASTER OF SCIENCE IN ENGINEERING DEGREE

Advanced professional engineering competencies are achieved through the M.S.E. program. This program is intended for those who have attained an engineering bachelor’s degree. Based on the very strong undergraduate, inter-departmental, college-wide engineering core plus option approach, this program leads to the M.S.E. degree, also based on an interdisciplinary approach, but at the department level. Thus the effective and efficient unified core approach is continued through the master’s level.

TYPICAL PROGRAM OF STUDY

<table>
<thead>
<tr>
<th>Academic Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental Core Courses (at least one advanced course in each departmental subdiscipline beyond B.S.E. requirements)</td>
<td>18</td>
</tr>
<tr>
<td>Additional subdiscipline-speciality courses</td>
<td>9</td>
</tr>
<tr>
<td>Additional advanced mathematics, computer systems, natural sciences, engineering sciences, or appropriate supportive areas (beyond B.S.E. core requirements or equivalent)</td>
<td>9</td>
</tr>
<tr>
<td>Thesis</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total M.S.E. Program</strong></td>
<td>45</td>
</tr>
</tbody>
</table>
MASTER OF SCIENCE DEGREE

This graduate program is designed to provide the competent student in engineering or other selected fields an opportunity to specialize in a particular subject area within engineering. Normally this objective may be attained through the satisfactory completion of graduate-level coursework and research endeavor.

TYPICAL PROGRAM OF STUDY

<table>
<thead>
<tr>
<th>Academic Area</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental core or subdiscipline-specialty courses</td>
<td>24</td>
</tr>
<tr>
<td>Additional advanced mathematics (beyond MATH 321), computer systems, natural sciences, engineering sciences, or appropriate supportive areas</td>
<td>12</td>
</tr>
<tr>
<td>Thesis</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL M.S. PROGRAM</td>
<td>45</td>
</tr>
</tbody>
</table>

MASTER OF SCIENCE IN ENVIRONMENTAL SYSTEMS MANAGEMENT DEGREE

The College of Engineering offers graduate work leading to the Master of Science in Environmental Systems Management. The program is designed to provide for advanced professional and specialized education in selected areas of engineering and science related to the management and control of our natural environment.

This program provides for the preparation of engineering specialists for service in environmental related occupations by allowing concentrated study in a limited number of subdisciplines. The program is open to those who have attained the bachelor's degree in engineering or science disciplines closely related to the environmental sciences and environmental or systems engineering.

TYPICAL PROGRAM OF STUDY

The following courses may be used in the program. A typical degree program will consist of a unified group of core courses plus optional/elective courses and a research report.

CORE PROGRAM

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEMS 431 Engineering Application of Computer Methods</td>
<td>3</td>
</tr>
<tr>
<td>CEES 501 Environmental Engineering Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 562 Management Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>CEES 611, 612 Environmental Engineering</td>
<td>4, 4</td>
</tr>
<tr>
<td>CEES 614 Sanitary Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>CEES 615 Atmospheric Pollution Control</td>
<td>3</td>
</tr>
<tr>
<td>CEES 618 Solid Waste Management</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 602 Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 678 Public Operating Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>XXXX 698 Research Report</td>
<td>3</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>36</td>
</tr>
</tbody>
</table>

OPTIONAL AREAS

Group I (3 of 4) Typical

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEES 461 Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CEES 471 Urban Planning</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 679 Public Systems Planning and Resource Allocation</td>
<td>3</td>
</tr>
<tr>
<td>IEMS 610 Project Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

Group II (3 of 4) Instrumentation

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECS 531 Environmental Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>EECS 535 Electric Power Generation and Distribution</td>
<td>3</td>
</tr>
<tr>
<td>EECS 625 Computer Simulation of Environmental Systems</td>
<td>3</td>
</tr>
<tr>
<td>EECS 645 Remote Sensing Optical Systems</td>
<td>3</td>
</tr>
</tbody>
</table>
Group III (3 of 4) Atmospheric

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAS 523 Acoustics</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 538 Environmental Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 653 Experiment Measurements</td>
<td>3</td>
</tr>
<tr>
<td>MEAS 673 Transport Processes</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL MSESM PROGRAM REQUIREMENT — 45 CREDITS
COLLEGE OF HUMANITIES AND FINE ARTS

ART
ENGLISH
FOREIGN LANGUAGES
FRENCH
GERMAN
ITALIAN
RUSSIAN
SPANISH
HISTORY
HUMANITIES
MUSIC
PRE-LAW
THEATRE
The College of Humanities and Fine Arts endeavors to fulfill with the other five colleges of the University the general aims of Florida Technological University. This College has the responsibility of preparing specialists in the principal disciplines of the humanities and the fine arts. The following major study programs are presently offered: art, English, foreign languages (French, Spanish), history, humanities, music, and theatre. Besides these majors, courses are offered in German, Italian, philosophy, religion and Russian.

In addition to preparing specialists in the various disciplines of the College, the College of Humanities and Fine Arts cooperates with the other five colleges of the University in the Environmental Studies Program and in offering electives suitable to all students.

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

To be certified for graduation, a student must achieve a “C” (2.0 grade point average) in courses of his major field.

If a student does not demonstrate acceptable skill in written or spoken English, he may be referred by an instructor to the Dean. Additional course work or an individual program of study may be assigned and must be satisfactorily completed before graduation.

MAJOR IN ART

Chairman: (Acting) Lotz  Bldg. AD 251, Phone 275-2676
Faculty: Eyfells, Gaudnek, Wellman

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, printmaking, drawing 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 27 quarter hours in art courses, including the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART 201, 202, 203</td>
<td>9</td>
</tr>
<tr>
<td>Design Fundamentals I, II, III (3, 3, 3)</td>
<td></td>
</tr>
<tr>
<td>ART 211, 212</td>
<td>6</td>
</tr>
<tr>
<td>Drawing Fundamentals I, II (3, 3)</td>
<td></td>
</tr>
<tr>
<td>ART 221, 222, 223</td>
<td>9</td>
</tr>
<tr>
<td>History of Art I, II, III (3, 3, 3)</td>
<td></td>
</tr>
<tr>
<td>ART 231</td>
<td>3</td>
</tr>
<tr>
<td>Visual Arts Overview</td>
<td></td>
</tr>
</tbody>
</table>

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>Q.H.</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>60</td>
</tr>
<tr>
<td>Art (48)</td>
<td></td>
</tr>
<tr>
<td>Allied Courses (12)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>54</td>
</tr>
<tr>
<td>Primarily to be selected from upper level courses</td>
<td></td>
</tr>
</tbody>
</table>
outside the Department, with the approval of the student’s adviser.

TOTAL QTR. HOURS REQUIRED 183

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

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td></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></td>
</tr>
<tr>
<td>Art (39)</td>
<td>45</td>
</tr>
<tr>
<td>Allied Courses (6)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
<tr>
<td>Primarily to be selected from upper level courses outside the Department, with the approval of the student’s adviser.</td>
<td>69</td>
</tr>
<tr>
<td>TOTAL QTR. HOURS REQUIRED</td>
<td>183</td>
</tr>
</tbody>
</table>

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, 321; ENG 371 and either ENG 471 or 472; 3 hours selected in consultation with the student’s advisor from upper-division literature courses; 12 hours selected from ENG 300, 302, 303, 304, 305, 401, 402, 403, 404, 405, 406, 407, 408, 409; and 9 hours selected in consultation with the student’s advisor from writing courses in English or Communications. All majors in writing must demonstrate acceptable skill in typing by the end of the sophomore year.

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>Q.H.</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>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>Primarily to be selected from upper level courses outside the Department, with the approval of the student’s adviser.</td>
<td>48</td>
</tr>
<tr>
<td>TOTAL QTR. HOURS REQUIRED</td>
<td>183</td>
</tr>
</tbody>
</table>
MAJOR IN FOREIGN LANGUAGES

Chairman: Cervone  Bldg. AD 395-C, Phone 275-2641
Faculty: Bergstrom, DiPierro, Payas, Taylor, Vance

Language studies in the College of Humanities and Fine Arts provide instruction in French, German, Italian, 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 a foreign culture and literature. Students enrolled in 100, 200, and certain 300-level 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 Fine Arts, and the Department of Foreign Languages. The foreign language major must complete 45 quarter hours in the chosen language beyond the 100 and 200 level. Among these 45 quarter hours the student must take courses numbered 301, 303, 311, 312, 313, and 401. (Course letter prefix is determined by the language.)

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

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. Moreover, in cases where the native speaker has received advanced education abroad he will not be permitted to take the advanced composition course 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>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Single Major</td>
<td></td>
</tr>
<tr>
<td>Environmental Studies</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>Electives</td>
<td>69</td>
</tr>
<tr>
<td>Primarily to be selected from upper level courses outside the Department, with the approval of the student’s adviser.</td>
<td></td>
</tr>
<tr>
<td>TOTAL QTR. HOURS REQUIRED</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
Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.

TOTAL QTR. HOURS REQUIRED 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

Faculty: Greenhaw, Hughes, Kallina, Pauley, Wehr Bldg. AD 247, Phone 275-2224

Students majoring in history must complete 48 quarter hours in history courses. The required courses are:

HIST 201, 202, 203 Western Culture and Civilization 12 (4, 4, 4)
HIST 311, 312, 313 American History (4, 4, 4) 12

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

AREAS

Q.H.

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

Major Area Credits 48
History

Electives 66
Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.

TOTAL QTR. HOURS REQUIRED 183

MAJOR IN HUMANITIES

Chairman: Flick Bldg. LR 226, Phone 275-2273
Faculty: Fetscher, Greene, Hotaling, Kassim, Levensohn, Riley, Riser

Since humanities provides an interdisciplinary approach to several areas of study, the major may be very broadly based, or it may be concentrated to some extent in one of these areas. In each case, however, the following apply:

(a) The major requires 48 hours, four of which may be used to satisfy the humanities requirement in Environmental Studies.

(b) Two years of a foreign language (or equivalent proficiency) are required.
Ordinarily a student completing this program would be able to continue his studies in philosophy at the graduate level.

HUM 301, 305, 308, and 310 (Mind-and-Art Series) 16
PHI 205, 221, 331, and 498 16
PHI 312 or 314 4
Humanities or philosophy electives (upper level) 12
TOTAL 48

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

Environmental Studies Program
Basic (55)
Advanced (14)

Major Area Credits
Specific requirements (48) 4 qtr. hrs. inc. in ESP
Foreign Language (18) 9 qtr. hrs. inc. in ESP

Electives
Primarily to be selected from upper level courses outside the Department, with the approval of the student’s adviser.

TOTAL QTR. HOURS REQUIRED 183

MAJOR IN MUSIC

Chairman: Sarakatsannis  Bldg. VC 135, Phone 275-2867
Faculty: Schoenbohm, Szabo, Szomoru, Whisler

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, composition, 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 101, 102, 103</td>
<td>Music Theory (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 201, 202, 203</td>
<td>Music Theory (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 301, 302, 303</td>
<td>Counterpoint (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 320, 321, 322</td>
<td>Orchestration (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 350</td>
<td>Composition</td>
<td>2-5</td>
</tr>
<tr>
<td>MUS 401, 402, 403</td>
<td>Form and Analysis (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 104, 105, 106</td>
<td>Music Literature (2, 2, 2)</td>
<td>6</td>
</tr>
<tr>
<td>MUS 218, 219, 220</td>
<td>Piano Literature (2, 2, 2)</td>
<td>6</td>
</tr>
<tr>
<td>MUS 221, 222, 223</td>
<td>Song Literature (2, 2, 2)</td>
<td>6</td>
</tr>
<tr>
<td>MUS 340, 341, 342</td>
<td>Music History (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 450, 451, 452</td>
<td>Music of the Twentieth Century (3, 3, 3)</td>
<td>9</td>
</tr>
<tr>
<td>MUS 304</td>
<td>Madrigal Singers</td>
<td>1</td>
</tr>
<tr>
<td>MUS 307</td>
<td>Concert Choir</td>
<td>1</td>
</tr>
<tr>
<td>MUS 308</td>
<td>Band</td>
<td>1</td>
</tr>
<tr>
<td>MUS 309</td>
<td>Orchestra</td>
<td>1</td>
</tr>
<tr>
<td>MUS 310</td>
<td>Chamber Music</td>
<td>1</td>
</tr>
<tr>
<td>MUS 351</td>
<td>Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUS 352</td>
<td>Conducting</td>
<td>2</td>
</tr>
<tr>
<td>MUS 491</td>
<td>Special Topics</td>
<td>2-5</td>
</tr>
<tr>
<td>MUS 492</td>
<td>Undergraduate Seminar</td>
<td>2-5</td>
</tr>
<tr>
<td>MUS 494</td>
<td>Independent Study</td>
<td>2-5</td>
</tr>
</tbody>
</table>

All students seeking this degree are expected to perform a faculty approved recital or equivalent in their major area. 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:

**AREAS**

<table>
<thead>
<tr>
<th>Environmental Studies Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic (55)</td>
</tr>
<tr>
<td>Advanced (14)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Area Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music (60)</td>
</tr>
<tr>
<td>Applied Music and Ensemble (36)</td>
</tr>
</tbody>
</table>

**Electives**

Primarily to be selected from upper level courses outside the Department, with the approval of the student’s adviser.

**TOTAL QTR. HOURS REQUIRED**

183

**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 THEATRE**

Chairman: *(Acting)* Combs Bldg. AD 252, Phone 275-2600

Faculty: Fay, Mays, Smith

The Department of Theatre offers the student an opportunity to concentrate in the area of theatre either as preparation for graduate or professional study or as a course of study in the liberal arts.
The major in Theatre consists of a minimum of 55 quarter hours.

The following courses are required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THA 180</td>
<td>Study of Theatre and Drama</td>
<td>3</td>
</tr>
<tr>
<td>THA 290</td>
<td>Theatre Practicum (2, 2, 2)</td>
<td>6</td>
</tr>
<tr>
<td>THA 310</td>
<td>History of Motion Pictures</td>
<td>4</td>
</tr>
<tr>
<td>THA 320, 321, 322</td>
<td>Theatre Practice II (1, 1, 1)</td>
<td>3</td>
</tr>
<tr>
<td>THA 424</td>
<td>Principles of Motion Picture Art</td>
<td>3</td>
</tr>
<tr>
<td>THA 434</td>
<td>Modern Motion Picture Techniques</td>
<td>3</td>
</tr>
<tr>
<td>THA 380, 480</td>
<td>Directing I and II (3, 3)</td>
<td>6</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THA 381, 382</td>
<td>Scene Design and Stage Lighting (4, 4)</td>
<td></td>
</tr>
</tbody>
</table>

Sixteen quarter hours must be elected from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>THA 280</td>
<td>Acting</td>
<td>4</td>
</tr>
<tr>
<td>THA 421</td>
<td>Dramatic Theory</td>
<td>3</td>
</tr>
<tr>
<td>THA 423</td>
<td>Contemporary Theatre and Drama</td>
<td>3</td>
</tr>
<tr>
<td>THA 425</td>
<td>Dramatic Criticism</td>
<td>3</td>
</tr>
<tr>
<td>THA 486, 487</td>
<td>American Theatre (6)</td>
<td></td>
</tr>
<tr>
<td>THA 483</td>
<td>Advanced Scene Design</td>
<td>3</td>
</tr>
<tr>
<td>THA 497</td>
<td>Undergraduate Seminar</td>
<td>2-5</td>
</tr>
<tr>
<td>THA 498</td>
<td>Independent Study</td>
<td>2-5</td>
</tr>
</tbody>
</table>

The student majoring in theatre should be aware of the foreign language requirements of most graduate schools if he is contemplating graduate studies.

The student majoring in theatre should plan to take courses in related fields, among them radio-television, communication, art, music and English. These courses are chosen by the student in consultation with his adviser.

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

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q.H.</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>55</td>
</tr>
<tr>
<td>Theatre</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>59</td>
</tr>
</tbody>
</table>

Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.

| TOTAL QTR. HOURS REQUIRED | 183  |
COLLEGE OF
NATURAL SCIENCES

BIOLOGICAL SCIENCE
BIOLOGY
BIOTECHNOLOGY
BOTANY
FRESH WATER ECOLOGY
MICROBIOLOGY
ZOOLOGY

CHEMISTRY

COMPUTER SCIENCE

INHALATION THERAPY

MATHEMATICS

MEDICAL RECORD ADMINISTRATION

MEDICAL TECHNOLOGY

PHYSICS

PREPROFESSIONAL
PREDENTAL
PREMEDICAL
PRENURSING
PREOPTOMETRY
PREPHARMACY
PREVETERINARY

STATISTICS
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 an 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;

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

The College of Natural Sciences will cooperate with the Colleges of Business Administration, Humanities and Fine Arts, 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) ENG 310, Professional Report Writing II;

(3) at least one year of mathematical sciences, one year of
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: Biological Science (with options in Biology, Biotechnology, Botany, Fresh Water Ecology, Microbiology, and Zoology), Chemistry, Computer Science, Inhalation Therapy, Mathematics, Medical Record Administration, Medical Technology, Physics, and Statistics. Preprofessional programs are also available to prepare students for further study in pharmacy, medicine, nursing, veterinary medicine, and other areas. These programs are administered directly through the Dean's office by a preprofessional coordinator with the help of faculty members appointed by the chairman of the major department or by the Dean of the College of Natural Sciences.

**PROGRAM PLANNING**

Although suggested curricula are available in most areas, each student will plan his or her 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**

Chairman: Pyne  Bldg. SCI 232, Phone 275-2741  
Faculty: Butler, Dabe, Laird, Rocek

The Department of Allied Health Sciences offers the Bachelor of Science degree in three fields:

**INHALATION THERAPY** - the treatment, management, control and care of patients with deficiencies and abnormalities associated with the breathing process, through the therapeutic use of such aids as medical gases, oxygen, aerosols, chest physical therapy, cardiopulmonary resuscitation and mechanical airways.

**MEDICAL RECORD ADMINISTRATION** - the development, maintenance and administration of systems of storage, retrieval and release of patient health information.

**MEDICAL TECHNOLOGY** - the identification of the nature and causes of disease through the use of precision instruments in the examination and analysis of samples of body fluids and tissues.

The first two years of study in Allied Health Sciences constitute a specified preprofessional program of basic education similar, but not identical, for all programs. The student then completes the professional phase of the program of his or her choice. Admission to study in this department does not constitute admission to the clinical (professional) year(s). Such admission 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 to the clinical portion of the program at least six months, but no more than one year, prior to the time the student is ready for admission.

Today's health care industry can best be described as dynamic, both from efforts within itself to seek new and improved health care delivery systems and from developments without, as seen in the rapid expansion of scientific knowledge and continuing medical advances. This has led to an increasingly critical need for highly trained personnel in an ever-widening variety of professional health fields. The present potential for programs of care, treatment and prevention of disease and disability is on a scale and of a quality never before envisioned. However, this potential can only be realized with the support of skilled professional personnel in the specialized health fields.

The Department of Allied Health Sciences offers the educational opportunities and clinical experience to prepare the health professional. The student must be prepared and willing to accept a multifaceted role as a member of the health care team - as administrator, planner, consultant, educator, researcher, and practitioner. Professional competence is built upon a solid grounding in the humanities, social sciences and natural sciences. The programs are designed to include not only the development of skills to assure
excellence in quality of health care, but such experiences and factual knowledge as will provide the basis for continuing intellectual and professional growth.

Graduates are prepared for positions in hospitals, medical and hospital laboratories, outpatient facilities, research centers, clinics, and in local, state and national health agencies and departments.

The degree requirements in each of the programs offered by the Department of Allied Health Sciences are summarized below:

<table>
<thead>
<tr>
<th>AREA</th>
<th>PROGRAM</th>
<th>Inhalation Therapy</th>
<th>Med Rec Admin</th>
<th>Med Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies</td>
<td></td>
<td>69</td>
<td>69</td>
<td>69</td>
</tr>
<tr>
<td>Major (inc. College Requirements)</td>
<td></td>
<td>105</td>
<td>108</td>
<td>102</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>16</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>190</td>
<td>190</td>
<td>190</td>
</tr>
</tbody>
</table>

Required courses leading to the Bachelor of Science degree in Inhalation Therapy, Medical Record Administration and Medical Technology are identified by course number in the curricula which follow. (NOTE: The curriculum shown under Medical Technology, Plan 2, is for those students who desire to take their clinical training entirely during the fourth year. Following completion of the three years of study as outlined the student must satisfactorily complete one full calendar year of study (not less than 36 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 Council of Medical Education of the American Medical Association, the American Society of Clinical Pathologists, and the American Society of Medical Technologists. Approved hospitals in the Orlando area are: Florida Hospital, Orange Memorial Hospital, and Winter Park Memorial Hospital. Upon completion of the hospital program, the student should request the hospital school director to forward a transcript of credits and a recommendation that the degree be conferred to the Chairman of the Department of Allied Health Sciences at Florida Technological University. Prospective students should contact the department for additional information on this procedure.)

### INHALATION THERAPY

#### FIRST YEAR

<table>
<thead>
<tr>
<th>AREA</th>
<th>PROGRAM</th>
<th>Inhalation Therapy</th>
<th>Med Rec Admin</th>
<th>Med Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allied Health Sciences</strong></td>
<td><strong>(AHS 100)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Sciences</td>
<td><strong>(BIOL 100; ZOOL 100)</strong></td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td><strong>(CHEM 111, 112, 113)</strong></td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(CHEM 114, 115)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td><strong>(ENG 101; SPE 101; COMP 101)</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>17</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

#### SECOND YEAR

<table>
<thead>
<tr>
<th>AREA</th>
<th>PROGRAM</th>
<th>Inhalation Therapy</th>
<th>Med Rec Admin</th>
<th>Med Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td><strong>(ZOOL 224, 334; MICR 200)</strong></td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>(ZOOL 335)</td>
<td></td>
<td></td>
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#### THIRD YEAR

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1 To be selected from courses numbered MATH 104 and higher.
FOURTH YEAR

Allied Health Sciences (AHS 320)  3  3  2
Inhalation Therapy (IT 462, 460, 410)  
(IT 463, 461)  1  1  1
(IT 440, 442, 420)  1  3  3
(IT 421)  1  3  3
(IT 430)  1  1  1
(IT 401, 402, 403)  1  1  1
Senior Seminar  2  2  2
Electives  3  4  3

TOTAL 16 12 13

TOTAL QUARTER HOURS REQUIRED  190

MEDICAL RECORD ADMINISTRATION

FIRST YEAR

Allied Health Sciences (AHS 100)  1  1  1
Biological Sciences (BIOL 100)  4  4  4
Physical Sciences  4  4  4
Communications (ENG 101; SPE 101; COMP 103)  3  3  3
Mathematics  4  4  4
Social Environment  3  3  3
Electives  7  7  7

TOTAL 18 15 17

SECOND YEAR

Biological Sciences (ZOOL 224, 334; MICR 200)  
(ZOOL 335)  5  3  4
Business Environment  2  2  2
Engineering Environment  3  3  3
English (ENG 310)  3  3  3
Humanities (HUM 201, HUM elective)  4  4  4
Social Environment  3  3  3
Statistics (STAT 201)  4  4  4
General Electives (Environmental Studies)  4  4  4

TOTAL 15 16 17

THIRD YEAR

Allied Health Sciences (AHS 320, 321)  
(AHS 350, 495)  3  3  3
Management (MGMT 301, 364)  5  5  5
Medical Record Administration (MRA 300, 301, 302)  
(MRA 305, 370, 371)  5  1  1
Senior Seminar  4  4  4
Electives  3  3  3

TOTAL 16 17 16

FOURTH YEAR

Allied Health Sciences (AHS 340, 341, 375)  3  3  3
Computer Science (COMP 484)  3  3  3
Medical Record Administration (MRA 403, 420, 421)  
(MRA 472, 473, 474)  2  2  2
(MRA 404)  3  3  3
Senior Seminar  2  2  2
Electives  3  3  3

TOTAL 15 14 14

TOTAL QUARTER HOURS REQUIRED  190

MEDICAL TECHNOLOGY

Program 1. Four years at Florida Technological University in which clinical training starts in the third year at a cooperating hospital. Students should note that this program is not currently available; however, it is planned for implementation in the future.

Program 2. Three years at Florida Technological University plus one calendar year at an approved hospital school of medical technology.

FIRST YEAR

Allied Health Sciences (AHS 100)  1  1  1
Biological Sciences (BIOL 100; ZOOL 100)  4  4  4

TOTAL 15 16 17

1 To be selected from courses numbered MATH 104 and higher.
Chemistry (CHEM 111, 112, 113; CHEM 114, 115) 4 3 3
Communications (ENG 101; SPE 101; COMP 101) 3 3 3
Mathematics\(^1\) 4 4 3
Social Environment 3 3 6
Electives 3
TOTAL 18 18 17

SECOND YEAR

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<th>Spring</th>
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THIRD YEAR

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<td>(CHEM 444, 445)</td>
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<td>Senior Seminar</td>
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<td>General Electives (Environmental Studies)</td>
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<td>Science Electives(^2)</td>
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FOURTH YEAR

Approved Hospital Program of 36 quarter credit hours.

TOTAL QUARTER HOURS REQUIRED 190

Those health occupations for which special education or training is usually required are designed to prepare the individual to function in the health services industry, and now number in excess of 100. The first two years of preclinical education are very similar for many of these areas. Students desiring to pursue their preclinical training at Florida Technological University, in programs other than those presently offered, should consult their adviser prior to beginning the program.

DEPARTMENT OF BIOLOGICAL SCIENCES

Chairman: Miller  Bldg. SCI 218, Phone 275-2141
Faculty: Charba, Chesnut, Ehrhart, Ellis, Gennaro, Koevenig, Kuhn, Mann, Reynolds, Snelson, Sweet, Taylor, Vickers, White, Whittier, Wodzinski

The Department of Biological Sciences offers a major in biological science with options in biology, biotechnology, botany, fresh water ecology, microbiology, and zoology.

BIOLOGICAL SCIENCE: BIOLOGY, BIOTECHNOLOGY, BOTANY, FRESH WATER ECOLOGY, 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 biotechnology, for those students seeking scientific careers based on application of biological knowledge; or botany, the study of plants; or fresh water ecology, the study of the environment of inland waters; or microbiology, the study of bacteria, yeasts, molds, and algae; or zoology, the study of animals. Through the judicious selection of electives in

\(^1\)To be selected from courses numbered MATH 110 and higher.

\(^2\)To be selected in consultation with adviser, from the Biological, Mathematical and Physical Sciences.
consultation with a faculty adviser, a specialty field, such as physiology, may be emphasized in one or more of the options outlined above.

The degree requirements in each of the options offered by the Department of Biological Sciences are summarized below:

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<tr>
<th>OPTION</th>
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<tr>
<td>Biotechnology</td>
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<td>Botany</td>
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<td>Fresh Water Ecology</td>
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<td>Microbiology</td>
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<td>Zoology</td>
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Required courses leading to the Bachelor of Science degree in biological science are identified by course number in the following curricula.

*including College requirements.

<table>
<thead>
<tr>
<th>BIOLOGICAL SCIENCES CORE CURRICULUM</th>
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<tbody>
<tr>
<td>FIRST YEAR</td>
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<tr>
<td>Biological Sciences (BIOL 100; ZOOL 100; BOT 100)</td>
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<td>Communications (ENG 101, 102; SPE 101)</td>
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</table>

| SECOND YEAR                          |
|                                      |
| Biological Sciences (MICR 200; BIOL 3603) | 4 | 4(5)3 | 5 |
| Chemistry (CHEM 161, 162, 163)        | 3 | 3 | 3 |
| Computer Science (COMP 102)           | 3 |
| Humanities (HUM 201, HUM elective)    | 4 | 4 |
| Physics (PHYS 107, 281)               | 4 |
| Social Environment                    | 3 |
| Statistics (STAT 201)                 | 4 |
| TOTAL                                | 17 | 15(16)3 | 16 |

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

2 To be selected in consultation with the student's adviser from courses numbered MATH 110 or higher.

3 Biotechnology majors substitute the biotechnology seminar (BIOL 492) and ENGR 361 for BIOL 360.
**BIOLOGY OPTION**

**THIRD YEAR**

<table>
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**FOURTH YEAR**

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**TOTAL QTR. HOURS REQUIRED**

190

**BOTANY OPTION**

**THIRD YEAR**

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**FOURTH YEAR**

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</table>

**TOTAL QTR. HOURS REQUIRED**

190

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1Students expecting to enter graduate school should seriously consider taking at least three quarters of a foreign language. In addition, students planning on graduate study in molecular-physiological areas of biology should take additional courses in statistics and biochemistry.

2To be selected in consultation with the student’s adviser.
### FRESH WATER ECOLOGY OPTION

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**TOTAL QTR. HOURS REQUIRED** 190

### MICROBIOLOGY OPTION

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<td>(Electives numbered 300 or above from ZOOL)</td>
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**TOTAL QTR. HOURS REQUIRED** 190

*It is recommended that the student consider taking ENGR 361 as one of these electives.

### ZOOLOGY OPTION

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**TOTAL QTR. HOURS REQUIRED** 190

*Students expecting to enter graduate school should seriously consider taking at least three quarters of a foreign language. In addition, students planning on graduate study in molecular-physiological areas of biology should take additional courses in statistics and biochemistry.
DEPARTMENT OF CHEMISTRY

Chairman: Baker Bldg. SCI 117, Phone 275-2246
Faculty: Clausen, Cunningham, Hertel, Idoux, Juge, Kujawa (Geology), Madsen, Mattson, McGee, Pilkington, Wheeler, Youngblood

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.

The degree requirements in chemistry are distributed as follows:

Environmental Studies 69
Major (including College requirements) 98
Electives 25
TOTAL 192

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

CHEMISTRY CURRICULUM

FIRST YEAR

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SECOND YEAR

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THIRD YEAR

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FOURTH YEAR

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</table>

TOTAL QTR. HOURS REQUIRED 192

1 Use of Social Environment - Option B and 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.

2 The 9 quarter hours of chemistry electives may be taken in either the junior or senior year.
DEPARTMENT OF MATHEMATICAL SCIENCES

Chairman: Dutton Bldg. GC 437, Phone 275-2341
Faculty: Anthony, Armstrong, Barr, Brigham, Falconer, Gerber, Haynam, Heinzer, Hurst, Ingram, Jones, Lindahl, Lytle, Norman, O'Hara, Ostle, Pettofrezzo, Rautenstrauch, Rhein, Rodriguez, Salzmann, Sawyer, Sherwood, Taylor, Wagner, Wheeler

The Department of Mathematical Sciences offers courses and programs of major study in three closely related areas: Mathematics, Computer Science, and Statistics. Emphasis is placed on the dual nature of the mathematical sciences: theoretical on the one hand and practical on the other.

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 need to use mathematics, statistics and computer science as tools in their specialty areas; (3) those who intend to teach mathematical sciences in secondary schools, colleges and universities; (4) those who desire to increase their understanding of these important disciplines.

The degree requirements in each of the three baccalaureate majors offered by the Department of Mathematical Sciences are summarized in the following table.

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</table>

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

**COMPUTER SCIENCE CURRICULUM**

**FIRST YEAR**

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<tr>
<td>Communications (ENG 101; SPE 101; COMP 102)</td>
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<td>Mathematics (MATH 221, 222, 223)</td>
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**SECOND YEAR**

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<tr>
<td>Computer Science (COMP 205, 206)</td>
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<tr>
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<tr>
<td>Mathematics (MATH 321)</td>
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<td>Statistics (STAT 301)</td>
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**THIRD YEAR**

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**FOURTH YEAR**

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**TOTAL QTR. HOURS REQUIRED**

183

1Mathematical Sciences Electives must include COMP 297, MATH 314, MATH 317.
2Computer Science majors must take five courses selected from upper level COMP courses, EECS 414.
### Mathematics Curriculum

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<td><strong>Total</strong></td>
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<td>16</td>
<td>15</td>
<td>15</td>
<td>46</td>
</tr>
</tbody>
</table>

**Total QTR. Hours Required**: 183

*Mathematical Sciences Electives must include at least either (a) twelve hours from group I, and six hours from group II, or (b) six hours from group I and twelve hours from group II.

**Group I**: (Geometry, topology and algebra) includes MATH 315, 316, 411, 412, 451, 452, 461, 462.


### Statistics Curriculum

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td>Biological Sciences</td>
<td>4</td>
<td>4</td>
<td>4</td>
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</tr>
<tr>
<td></td>
<td>Communications (ENG 101; SPE 101; COMP 102)</td>
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<td></td>
<td>Mathematics (MATH 221, 222, 223)</td>
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<tr>
<td></td>
<td>(MATH 211, 271)</td>
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<td></td>
<td>Social Environment</td>
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<tr>
<td><strong>Second Year</strong></td>
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<td>Computer Science (COMP 205, 206)</td>
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<tr>
<td></td>
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<td>Social Environment</td>
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<td></td>
<td>Mathematics (MATH 321)</td>
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<tr>
<td></td>
<td>Statistics (STAT 301)</td>
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<td>Mathematical Sciences Electives</td>
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<td><strong>Third Year</strong></td>
<td>Business Environment</td>
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<td>Social Environment</td>
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<td>9</td>
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<tr>
<td></td>
<td>Mathematics (MATH 421, 422, 423)</td>
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<tr>
<td></td>
<td>Senior Seminars</td>
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<td></td>
<td>Statistics (STAT 341, 342, 343)</td>
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<td></td>
<td>(STAT 401, 402, 332)</td>
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<td>Mathematical Sciences Electives</td>
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<tr>
<td></td>
<td>Senior Seminar</td>
<td></td>
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<td>2</td>
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<tr>
<td></td>
<td>General Electives (Environmental Studies)</td>
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<td><strong>Fourth Year</strong></td>
<td>Computer Science (COMP 481, 482)</td>
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<td>Senior Seminars</td>
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<tr>
<td></td>
<td>English (ENG 310)</td>
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<tr>
<td></td>
<td>Statistics Electives</td>
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<td>3</td>
<td>9</td>
</tr>
<tr>
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<td>Mathematical Sciences Elective</td>
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<td>3</td>
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<td>9</td>
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<tr>
<td></td>
<td>Elective</td>
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<td>3</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>15</td>
<td>14</td>
<td>16</td>
<td>45</td>
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</tbody>
</table>

**Total QTR. Hours Required**: 183
DEPARTMENT OF PHYSICS

Chairman: Noon Bldg. EN 312, Phone 275-2325
Faculty: Bolemon, Bolte, Brennan, Haley, Henderson, Katzin, Oelfke

The Physics Department offers courses suited for many different students: for example, for those who desire to learn about their physical environment and to understand and apply scientific methods, for prospective teachers in secondary schools, and for students in science and engineering. Physics is a basic science fundamental to many different fields of endeavor and the courses offered are designed to reflect this fact.

The usual physics program involves a combination of lecture and laboratory courses. In lectures a wide range of physical phenomena, theoretical explanations and analysis techniques are discussed. In laboratory work students have opportunity for observation and measurement using modern scientific instrumentation. The curriculum is designed to allow maximum flexibility and provides choice of electives so that physics majors can also study other areas in depth. Students will be in a good position to make a career choice by the end of their sophomore year, after completing courses in Mathematics, Humanities, and Biological, Behavioral, and Social Sciences, as well as a variety of topics in Physics. At this point the student should consult his adviser to plan a program for his electives in order to prepare for a career related to his interest and abilities. Those wishing to pursue graduate study in Physics will also be advised of the opportunities which exist and whether extra course work should be taken.

The degree requirements consist of:

<table>
<thead>
<tr>
<th></th>
<th>Q.H.</th>
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<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
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<tr>
<td>Physics Core</td>
<td>63</td>
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<tr>
<td>Restricted Electives</td>
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<td>Electives</td>
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<tr>
<td><strong>TOTAL QTR. HOURS REQUIRED</strong></td>
<td><strong>183</strong></td>
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PHYSICS CURRICULUM

FIRST YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
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<th>S</th>
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<tbody>
<tr>
<td>Physics (PHYS 211, 212, 213)</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<tr>
<td>(PHYS 282, 283)</td>
<td></td>
<td></td>
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<tr>
<td>Mathematics (MATH 211, 221, 222)</td>
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<td>4</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Communications (ENG 101; SPE 101; COMP 102)</td>
<td>3</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>14</td>
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SECOND YEAR

<table>
<thead>
<tr>
<th>Course</th>
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<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics (PHYS 321, 331, 341)</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Mathematics (MATH 223, 321, 331)</td>
<td>4</td>
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<tr>
<td>Humanities (HUM 201, HUM Elective)</td>
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<td></td>
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</tr>
<tr>
<td>Statistics</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Social Environment</td>
<td>3</td>
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<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>16</td>
<td>16</td>
<td>15</td>
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</table>

THIRD YEAR

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>Physics Restricted Electives*</td>
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<td>Physics (PHYS 371)</td>
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<td>(PHYS 381, 382)</td>
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<tr>
<td>Social Environment</td>
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<td>3</td>
</tr>
<tr>
<td>English (ENG 310)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Electives††</td>
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<td>7</td>
<td>10</td>
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<tr>
<td><strong>TOTAL</strong></td>
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<td>10</td>
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FOURTH YEAR

<table>
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<th>S</th>
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</thead>
<tbody>
<tr>
<td>Physics Restricted Electives**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering Environment</td>
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<td>3</td>
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<td>Business Environment</td>
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<tr>
<td>Senior Seminars</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Electives††</td>
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<td>7</td>
<td>7</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

**TOTAL QTR. HOURS REQUIRED** 183

*PHYS 325, 345, 363 or 4--.
††4 hours must be used to satisfy the General Elective Requirements of the Environmental Studies Program.

**All PHYS 4-- courses.
PREPROFESSIONAL PROGRAMS

The Office of the Preprofessional Coordinator has been created to operate as a service to all students preparing for and seeking admission to a professional school of dentistry, medicine, nursing, optometry, pharmacy, and veterinary medicine. The services afforded the student through this office are numerous and range from simple advising and counseling in preprofessional matters to providing a compiled preprofessional evaluation of the student to each professional school to which he desires to apply. Upon entering the preprofessional program at Florida Technological University, each student will be assigned to a faculty adviser within the academic department of his major. Each student is urged to take full advantage of the services available through this office.

PREMEDICAL, PREDENTAL, AND PREVETERINARY PROGRAMS

Although many professional schools accept students who have satisfactorily completed three years of college and possess excellent credentials, a large and growing number require the completion of the baccalaureate degree. In any event, the applicant with given credentials and in possession of the baccalaureate degree will find himself in a much more competitive position for a place in a professional school than a comparable applicant not in possession of the degree. For this reason each pre dental, premedical, and preveterinary student is urged to choose a degree granting program for a major since majors such as “premed” do not lead to the awarding of a degree. Also, each student is encouraged to pursue a degree program to prepare himself for an alternate career in the event he is denied a place in a professional school. The prospective preprofessional student may select as his major any degree granting program offered at Florida Technological University; however, those degree programs within the College of Natural Sciences will lend themselves most easily to the preprofessional preparation due to the nature and content of their curricula. While satisfying his degree requirements, the student will find in his curriculum many courses that are also admission requirements to many professional schools. In addition, he will find in his curriculum adequate elective hours with which, in consultation with his adviser, to obtain other needed courses not specifically contained within the curriculum of his degree program. If the student completes all the courses listed in Table 1, he will have satisfied the specific course 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 USA 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. Each student is urged to consult these publications to determine the specific admission requirements of the professional schools to which he is planning to make application.

Information regarding specific admission requirements to schools of Veterinary Medicine can be obtained from the Office of the Preprofessional Coordinator.

TABLE I. PREDENTAL, PREMEDICAL, PREVETERINARY REQUIREMENTS

<table>
<thead>
<tr>
<th>COURSE</th>
<th>COURSE TITLE</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 100</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 360</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 420</td>
<td>Cytology</td>
<td>4</td>
</tr>
<tr>
<td>BOT 100</td>
<td>General Botany</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121,122,123,124</td>
<td>Organic Chemistry Lecture and Lab</td>
<td>14</td>
</tr>
<tr>
<td>CHEM 261,262,263,361,362</td>
<td>Chemistry Fundamentals</td>
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<tr>
<td>CHEM 351,352</td>
<td>Analytical Laboratory Techniques</td>
<td>8</td>
</tr>
<tr>
<td>ENG 101,102,103</td>
<td>Composition I, II, Literature</td>
<td>9</td>
</tr>
<tr>
<td>MATH 211,221,222,223</td>
<td>Analytic Geometry, Calculus</td>
<td>15</td>
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<tr>
<td>MICR 200</td>
<td>General Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211,212,213</td>
<td>General Physics Lecture and Lab</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>282,283</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(or 107,108,189,281)</td>
<td></td>
</tr>
</tbody>
</table>

1Students deficient in algebra and trigonometry must make up this deficiency before enrolling in MATH 211.
Those students who successfully gain admission to a professional school after the completion of the junior year of a degree program within the College of Natural Sciences 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 should request the dean of the professional school to forward to the Dean of the college of Natural Sciences at Florida Technological University a transcript of credits and a recommendation that the degree be conferred.

**PREOPTOMETRY AND PREPHARMACY**

Specific curricula have been designed to satisfy the requirements for admission to schools of optometry and pharmacy without the student being required to pursue a degree granting program. A list of these required courses is shown in Tables II and III.

**TABLE II. PREOPTOMETRY REQUIREMENTS**

<table>
<thead>
<tr>
<th>COURSE</th>
<th>COURSE TITLE</th>
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</thead>
<tbody>
<tr>
<td>BIOL 100</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BOT 100</td>
<td>General Botany</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 161, 162, 163</td>
<td>Chemical Principles</td>
<td>9</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
<td>26</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSE</th>
<th>COURSE TITLE</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 121, 122, 123, 124</td>
<td>Organic Chemistry Lecture &amp; Lab</td>
<td>12</td>
</tr>
</tbody>
</table>

1Electives should include courses in the Humanities, American History, Political Science, Psychology, the Social Sciences, and the Natural Sciences.

2Proficiency 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.

**TABLE III. PREPHARMACY REQUIREMENTS**

<table>
<thead>
<tr>
<th>COURSE</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>BIOL 100</td>
<td>General Biology I</td>
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</tr>
<tr>
<td>BOT 100</td>
<td>General Botany</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 161, 162, 163, 114</td>
<td>Chemical Principles Lecture &amp; Lab</td>
<td>10</td>
</tr>
<tr>
<td>CHEM 121, 122, 123, 124</td>
<td>Organic Chemistry Lecture &amp; Lab</td>
<td>12</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
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<tr>
<td>ENG 101, 102, 103</td>
<td>Composition I, II, Literature</td>
<td>9</td>
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<tr>
<td>HUM 201 and two courses from 300-310 series</td>
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<td>4</td>
</tr>
<tr>
<td>MATH 111, 211, 221</td>
<td>Precalculus, Analytic Geometry, Calculus</td>
<td>12</td>
</tr>
<tr>
<td>PHYS 107, 108, 189, 281</td>
<td>General Physics Lecture &amp; Lab</td>
<td>12</td>
</tr>
<tr>
<td>ZOOL 100</td>
<td>General Zoology</td>
<td>4</td>
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</table>

**OTHER PREPROFESSIONAL PROGRAMS**

Preprofessional preparation is also available to students in other areas such as nursing, occupational therapy, physical therapy, etc. However, the requirements of professional schools offering degrees and/or clinical training in any of these fields, although similar, vary significantly. Students desiring to take preprofessional work in any of these areas should consult with the preprofessional coordinator prior to beginning their programs.

1Students not prepared for MATH 111 must take MATH 110.

2Approved electives may include CHEM 351, 352, STAT 301, MICR 200, PSY 201, SOC 201, ECON 201 or other courses selected in consultation with the student's adviser.
COLLEGE OF
SOCIAL SCIENCES

COMMUNICATION
JOURNALISM
RADIO-TELEVISION
SPEECH
SPEECH PATHOLOGY
ECONOMICS
LAW ENFORCEMENT
POLITICAL SCIENCE
PUBLIC ADMINISTRATION
PRE-LAW
PSYCHOLOGY
SOCIOLOGY
ANTHROPOLOGY
SOCIAL WELFARE

MASTER OF ARTS IN COMMUNICATION
MASTER OF SCIENCE IN PSYCHOLOGY
In keeping with the aims of Florida Technological University, the College of Social Sciences provides a curricula designed: (1) to develop competence in specialized professional disciplines through academic and practical preparation; (2) to provide increased awareness of the development, purposes, and functioning of the social sciences in the world that surrounds us. The College awards the baccalaureate degree in the following areas: Communication (Journalism, Radio-Television, Speech, Speech Pathology), Economics, Law Enforcement, Political Science (Public Administration), Psychology, and Sociology (Anthropology, Social Welfare). The College also awards the Masters Degree in Communication and Psychology.

In addition to providing specialized training, the College of Social Sciences functions in a service capacity by making available a selection of courses designed to complement the offerings of the other five colleges of the University.

A student enrolled in the College as an undergraduate must fulfill all University degree requirements including the Environmental Studies Program, as well as the particular requirements set forth by the department for each area of specialization. To be certified for graduation, a student must achieve a "C" grade point average (2.0) in the courses of his major.

A student whose written or oral communication in any course is deemed unsatisfactory may be referred to the Dean by the instructor. Additional course work or an individual study program may be assigned consistent with the needs of the student and must be completed before the degree is granted.

### MAJOR IN COMMUNICATION

Chairman: (Acting) Buchanan Bldg. AD 140, Phone 275-2681
Faculty: Arnold, Carter, Couch, Fedler, Jackson, Johansen, Johnson, Kennedy, Meeske, O'Keefe, Taylor, Ward

### BACHELOR OF ARTS IN COMMUNICATION

The Department of Communication affords the student an opportunity to concentrate in the areas of communication with emphasis in journalism, radio-television, speech, or speech pathology.

A major in communication requires a minimum of 54 hours including the following courses.

- **COM 100** Basic Communication 3
- **COM 301** Communication as a Behavioral Science 4

Any student contemplating graduate studies should be aware of special requirements in some graduate schools, such as foreign languages, statistics, and computer programming.

An internship program is available to qualified students. This program earns elective credit only and cannot be applied to the major requirement of 54 hours.

Students may select one of the following programs of study to complete the requirements for a major in communication:

### EMPHASIS PROGRAM

In the student's overall program in communication, 30-36 quarter hours must be elected in an area of emphasis, whether journalism, radio-television, speech, or speech pathology. In addition, 11-17 quarter hours must be elected within two additional areas in the communication department other than the field selected for emphasis. The following are required courses based upon the emphasis chosen:
Journalism:

COM 319 News Writing 5
JRN 321 Copy Editing 4
JRN 322 Information Processing 4
JRN 330 History of American Journalism 4
COM 411 Legal Responsibilities of the Mass Media 4
JRN 431 International Communication and the Foreign Press 4
COM 434 Principles of Advertising 4

Other recommended courses for those students planning a career in news reporting include PSY 308, SOC 325, SOC 331, and SOC 335.

Radio-Television:

RTV 140 Foundations of Broadcasting 4
RTV 346 Radio-Television and Society 4
COM 411 Legal Responsibilities of the Mass Media 4
RTV 448 Broadcast Regulations 4
RTV 452 Broadcast Criticism 4

In addition the student must select one of the following three courses:

RTV 340 Audio Production 4
RTV 341 Television Production 4
RTV 345 Film for Television 4

Other recommended courses include COM 310, SOC 325, and PSY 308.

Speech:

SPE 261 English Phonetics and American Dialect 5
SPE 360 Argumentation and Debate 4
COM 363 Group Interaction and Decision-Making 4
SPE 366 Speech Composition 4
SPE 371 Speech and Human Relations 3
SPE 362 Platform Speaking 4

In addition, required hours must be selected from each of the following areas:

Interpersonal and Organizational Communication (3-4 hrs): COM 313 Interpersonal Communication 3
COM 312 Leadership Through Oral Communication 4
SPE 361 Persuasion: Motivation 4

Experimental (4 hrs):

COM 460 Group Dynamics 4
COM 462 Persuasion: Attitude Formation and Change 4
COM 463 Studies in Listening 4

History and Criticism (4-5 hrs):

SPE 468 Survey of Rhetoric 5
SPE 470 History and Criticism of American Public Address 4
SPE 471 History and Criticism of British Public Address 4
SPE 472 Rhetoric of Social and Political Action 4

Students interested in secondary school teaching should refer to the Speech Education Program contained within the College of Education for program information.

Speech Pathology:

SPE 261 English Phonetics and American Dialect 5
SPE 364 Physical Bases of Speech and Hearing 5
PSY 333 Development of Language and Conceptual Behavior 4
SPE 440 Problem of Articulation Delayed Speech and Language 3
SPE 445 Basic Audiology 4
SPE 450 Hearing Habilitation 5
SPE 452 Speech and Language Problems 5
SPE 453 Observation and Clinical Practice I 4
SPE 454 Observation and Clinical Practice II 4

GENERAL PROGRAM

In the student's overall program in communication 35-36 quarter hours are required. In addition, a minimum of 11-12 hours must be selected within two of the areas in the Communication Department. The following are the required courses:
Communication:

COM 363 Group Interaction and Decision-Making 4
COM 410 Social Responsibilities of the Mass Media 4
COM 411 Legal Responsibilities of the Mass Media 4
COM 462 Persuasion: Attitude Formation and Change 4

In addition, required hours must be selected from each of the following areas:

History (4 hrs):

RTV 140 Foundation of Broadcasting 4
JRN 330 History of American Journalism 4
SPE 468 Survey: Classical and Non-Classical Rhetoric 4
SPE 470 History and Criticism of American Public Address

Motivation (7-8 hrs):

COM 432 Mass Media in Developing Countries 3
JRN 433 Propaganda and Psychological Warfare 4
COM 426 Public Relations 4
COM 434 Principles of Advertising 4
RTV 452 Broadcast Criticism 4
SPE 361 Persuasion-Motivation 4
SPE 371 Speech and Human Relations 3

Research (8 hrs):

COM 400 Opinion and the Mass Media 4
COM 313 Interpersonal Communication 4
COM 460 Group Dynamics 4
COM 463 Studies in Listening 4

For course descriptions refer to specific areas: Communication, Journalism, Radio-Television, Speech.

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

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q.H.</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>54</td>
</tr>
<tr>
<td>Electives</td>
<td>60</td>
</tr>
<tr>
<td>Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL QUARTER HOURS REQUIRED 183

MASTER OF ARTS IN COMMUNICATION

The Department of Communication offers a diversified program, individual and flexible, leading to the Master of Arts Degree in Communication. Instruction is offered in mass communication, communication theory and research, informational and educational systems, persuasion, and other areas drawn from the divisions of Journalism, Radio-Television, and Speech.

Admission to the program will be made on the basis of minimal University requirements, GPA, MAT, GRE, three letters of recommendation from undergraduate professors, and the undergraduate transcript.

The graduate student in Communication will be required to take a minimum of 45 quarter hours and to maintain a grade of "B" or better for each course taken in the department. The student will present a satisfactory thesis and stand a comprehensive written and oral examination. In addition, the student may be required to demonstrate a proficiency in statistics and computer programming.

The basic core (24 hours) is required of all students in the program.
MAJOR IN ECONOMICS

Students majoring in economics in the College of Social Sciences must take ACCY 307, ECON 201, 202, 203, 321, 431, ENG 301, and FIN 331, and 28 hours beyond the Environmental Studies requirements, 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 Social Sciences.

Students may select one of the following two programs of study to complete major course requirements for the Bachelor of Arts degree in Economics:

1. General Economics
   A. Required:
      ECON 301 Intermediate Price Theory 4
      ECON 311 Intermediate Money, Income and Employment Theory
   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
      ECON 371 Mathematical Economics 4
      ECON 421 Economic Statistical Analysis 5
      ECON 451 Econometrics 3
   B. Elective:
      Three courses in economics not used elsewhere.

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

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q.H.</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>82-86</td>
</tr>
<tr>
<td>Electives</td>
<td>28-33</td>
</tr>
<tr>
<td>Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL QTR. HOURS REQUIRED 183

JOURNALISM (See Communication)

MAJOR IN LAW ENFORCEMENT

Law enforcement is a complex and demanding profession. It offers a special challenge in a society such as ours that has so heterogeneous and mobile a population, that is so dynamic and complex; that has so high a degree of urbanization with its accompanying congestion and anonymity and that places so high a value on individual freedom, and upon equality under the law. However, a career in law enforcement also offers substantial rewards. It enables young men and women to serve their country and their community in an extraordinarily interesting, active and complex field. The program of study is designed to assist the student to attain specific professional career objectives as well as to provide him with a general background in the social and administrative sciences. The satisfactory completion of the curriculum leads to the degree of Bachelor of Arts in Law Enforcement.
LAW ENFORCEMENT

The present major in law enforcement requires 75 quarter hours of law enforcement and law enforcement-related course work. This total is subdivided into the following two general categories of course requirements:

1. Courses in Law Enforcement

Forty-five (45) quarter hours of LENF courses must be completed, including the following courses:

LENF 201 Law Enforcement 5
LENF 202 Administration of Justice 4

2. Interest Course Requirements

The balance of the 75 quarter hour requirement — 30 hours — must come from the following listing of approved courses, with at least two courses from each of the three areas.

Area I
COM 400 Opinion and the Mass Media 4
COM 401 Communicative Process in Government 3
COM 410 Social Responsibilities of the Mass Media 4
COM 411 Legal Responsibilities of the Mass Media 4
JRN 330 History of Journalism 3
JRN 426 Public Relations 3
JRN 429 Mass Media and Popular Culture 3
REL 321 Religion in America 4
SPE 371 Speech and Human Relations 3
SPE 460 Group Dynamics 4
SPE 472 Rhetoric of Social and Political Action 4

Area II
PCL 360 American Political Philosophy 4
PCL 410 Public Administration 4
PCL 414 Metropolitan Administration I 4

PCL 471 or
473 American Constitutional Law 5

PSY 306 Psychology of Adjustment 4
SOC 331 Social Problems 3
SOC 335 Social Institutions 3
SOC 345 Juvenile Delinquency 5
SOC 346 Criminology 5
SOC 352 Intergroup Conflict and Prejudice 3

Area III
ECON 307 Economic History of the United States 3
ENG 321 Exploring Poetry 3
HIST 324 Black American History 4
HIST 418 United States History: 1941 - present 4
HIST 452 The Middle Ages and the Renaissance 5
HUM 335 Afro-American Culture 4
HUM 371 Contemporary Culture 4
PHI 331 Ethics 4
PHI 341 Aesthetics 4
PHI 405 Philosophy of Religion 4
PHI 409 Philosophy of Science 4

There is no foreign language requirement for students majoring in law enforcement, however, students whose career interests might be expected to bring them into contact with large numbers of non-English-speaking citizens are advised to take the appropriate foreign language electives.

The following table summarizes the requirements for a major in law enforcement:

AREAS
Environmental Studies Program 69
Basic (55)
Advanced (14)
Major Area Credits 75
Law Enforcement (45)
Allied Courses (30)
MAJOR IN POLITICAL SCIENCE

Chairman: Young Bldg. AD 352, Phone 275-2608
Faculty: Bledsoe, Boop, Jervey, Jones, Kennedy, Smyth

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 48 quarter hours, including the following courses:

PCL 201 American National Government 4
PCL 203 Principles of Political Science 4

A student must also include a minimum of five courses at the 400 level. A portion of the student's remaining elective hours should be taken in such related fields as anthropology, computer science, economics, geography, history, management, mathematics, philosophy, psychology, sociology, or statistics according to the interests of the student and with the concurrence 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 to 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.

PUBLICATION ADMINISTRATION

Students considering careers in public service at the federal, state or local level may opt for the public administration concentration offered by the Department of Political Science, College of Social Sciences. The following courses are required for completion of the concentration:

PCL 201 American National Government
PCL 308 The American Presidency
or
PCL 310 Congress and the Legislative Process
PCL 410 Public Administration
PCL 413 Metropolitan Politics
or
PCL 414 Metropolitan Administration I
or
PCL 415 Metropolitan Administration II
LENF 301 Criminal Law in Action
or
BADM 371 Business Law
or
PCL 433 International Law
or
PCL 471 American Constitutional Law
or
PCL 473 American Constitutional Law
PCL 497 Undergraduate Seminar
or
PCL 498 Independent Study

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

**AREA**

Environmental Studies Program
Basic (55)
Advanced (14)

Major Area Credits

39
183
Electives
Primarily to be selected from upper level courses outside the Department, with the approval of the student's adviser.
TOTAL QTR. HOURS REQUIRED  66

MAJOR FOR PRE-LAW STUDENTS

Recommendation of particular courses or curricula to students interested in the study of law is not undertaken by the Association of American Law Schools on Prelegal Education. The Association's statement on prelegal education does recommend an undergraduate education which emphasizes comprehension and verbal expression, a critical understanding of the human institutions, values and processes with which the law deals, plus creativity in thought and expression.

While specific courses generally are not required for admission to law school, the probability of success in the study of law can be enhanced through a carefully developed undergraduate program which places emphasis on both the theoretical and practical aspects of the discipline. The Department of Political Science is in an ideal position to fulfill the student's needs in each. A pre-law program centered on political science but complemented by English, communications, business, economics, and other courses should provide an excellent foundation for the prospective law student.

MAJOR IN PSYCHOLOGY

Chairman: Abbott Bldg. AD 138, Phone 275-2216
Faculty: Brophy, Burroughs, Edelman, Fisher, Frank, Freeman, Hanratty, Jaffee, Lahey, Rollins, Tell, Van Twyver

BACHELOR OF ARTS IN PSYCHOLOGY

The major in psychology consists of 44 quarter hours, including the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 201</td>
<td>General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 301</td>
<td>Basic Learning Processes</td>
<td>4</td>
</tr>
<tr>
<td>PSY 303</td>
<td>Physiological Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSY 309</td>
<td>Personality Theory</td>
<td>4</td>
</tr>
<tr>
<td>PSY 311</td>
<td>Methods of Psychological Research</td>
<td>3</td>
</tr>
</tbody>
</table>

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

Required courses from allied areas:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 101</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP 102</td>
<td>Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>MATH 221</td>
<td>Calculus</td>
<td>5</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 360</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>STAT 301</td>
<td>Fundamentals of Probability and Statistics</td>
<td>4</td>
</tr>
<tr>
<td>STAT 401</td>
<td>Statistical Methods</td>
<td>4</td>
</tr>
</tbody>
</table>

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>Q.H.</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>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></td>
</tr>
<tr>
<td>Primarily to be selected from</td>
<td>55</td>
</tr>
<tr>
<td>upper level courses</td>
<td></td>
</tr>
<tr>
<td>outside the Department, with</td>
<td></td>
</tr>
<tr>
<td>the approval of the student's</td>
<td></td>
</tr>
<tr>
<td>adviser.</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL QTR. HOURS REQUIRED  183
MASTER OF SCIENCE IN PSYCHOLOGY

The Master's program in Psychology currently emphasizes training in industrial psychology. The program may be used as preparation for: (a) a position as a master's level industrial psychologist, and (b) as preparation for entering a doctoral program in Industrial Psychology at another University.

Admission to the program will be made on the basis of the GPA, MAT, GRE (Aptitude and Psychology), three letters of recommendation and the undergraduate transcript.

The degree requires the completion of 70 quarter hours of course work including a quantitative research thesis (PSY 699). A qualifying examination at the completion of the basic core courses must be passed for the student to be admitted to candidacy for the degree. At this time the advisory committee of 3 departmental faculty members will be appointed. This committee will be responsible for advising the student on program, thesis, and course work. A comprehensive examination, administered at the end of a student's second year will cover all applied areas of the program, emphasizing but not limited to the thesis.

The Basic Core (30 hours) and Advanced Core (19 hours) are required of all students in the program. The qualifying examination must be passed prior to enrollment in any of the Advanced Core courses.

Basic Core: PSY 601, PSY 602, PSY 607, PSY 608, PSY 612, PSY 690, PSY 695.

Advanced Core: PSY 650, PSY 651, PSY 660, PSY 670, PSY 690.

The qualifying, comprehensive and final oral examination may be taken no more than 2 times each.

RADIO-TELEVISION (See Communication)

MAJOR IN SOCIOLOGY

Chairman: Unkovic  Bldg. EN 103, Phone 275-2227
Faculty: Allen, Brock, Miller, Smith, Strong, Wright

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 201</td>
<td>General Sociology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 304</td>
<td>Development of Social Thought</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC 306</td>
<td>Modern Sociological Thought</td>
<td>4</td>
</tr>
<tr>
<td>SOC 310</td>
<td>Physical Anthropology &amp; Archeology</td>
<td>4</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC 311</td>
<td>Social Anthropology</td>
<td>4</td>
</tr>
<tr>
<td>SOC 331</td>
<td>Social Problems</td>
<td>4</td>
</tr>
<tr>
<td>SOC 495</td>
<td>Undergraduate Research Methods</td>
<td>4</td>
</tr>
<tr>
<td>STAT 201</td>
<td>Principles of Statistics</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL:</td>
<td></td>
<td>23</td>
</tr>
</tbody>
</table>

The remaining quarter hours may be taken in other sociology courses, according to the interests of the student and with the concurrence of his or her advisor. Recommended electives for sociology majors are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCY 307</td>
<td>Accounting Concepts</td>
<td>5</td>
</tr>
<tr>
<td>ENG 103</td>
<td>Current Literature (PR: ENG 101 or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>ENG 410</td>
<td>Contributions of Minority Groups to American Literature</td>
<td>3</td>
</tr>
<tr>
<td>EDTA 206</td>
<td>Human Development (EDTA 307 recommended concurrently)</td>
<td></td>
</tr>
<tr>
<td>EDTA 307</td>
<td>Teaching Analysis (EDTA 206 recommended concurrently)</td>
<td>5</td>
</tr>
<tr>
<td>LENF 201</td>
<td>Law Enforcement</td>
<td>5</td>
</tr>
<tr>
<td>LENF 401</td>
<td>Selected Problems in Law Enforcement</td>
<td>5</td>
</tr>
<tr>
<td>MGMT 301</td>
<td>Management (PR: ECON 203)</td>
<td>5</td>
</tr>
<tr>
<td>PCL 310</td>
<td>Congress and the Legislative Process (PR: PCL 201, 203 or consent of instructor)</td>
<td>4</td>
</tr>
<tr>
<td>PCL 413</td>
<td>Metropolitan Politics (PR: PCL 201, 203 or consent of instructor)</td>
<td>4</td>
</tr>
<tr>
<td>PSY 300</td>
<td>Applied Psychology</td>
<td>4</td>
</tr>
<tr>
<td>PSY 306</td>
<td>Psychology of Adjustment</td>
<td>4</td>
</tr>
<tr>
<td>PSY 308</td>
<td>Social Psychology (PR: PSY 201, 202)</td>
<td>4</td>
</tr>
<tr>
<td>SPE 363</td>
<td>Group Discussion and Interaction</td>
<td>4</td>
</tr>
<tr>
<td>SPE 462</td>
<td>Attitude Formation and Change (PR: SPE 360 or consent of instructor)</td>
<td>4</td>
</tr>
</tbody>
</table>
Students enrolled in the anthropology concentration must take the following courses as part of the required 48 hours:

(SOC 201, 310 and 311 are prerequisites for SOC 314, 315, 316 and 402).

SOC 310 Introductory Anthropology 4
SOC 311 Introductory Anthropology 4
SOC 314 Cultural Anthropology 4
SOC 315 Physical Anthropology 4
SOC 316 Comparative Social Organization 4
SOC 402 Method and Theory in Anthropology 4

TOTAL: 24 Quarter Hours

Recommended electives for sociology majors in the anthropology concentration are as follows:

BIOL 360 Genetics (PR: BIOL 100) 4
COMP 101 Introduction to Computer Science 3
ENG 371 Principles of Linguistics 3
GEOL 100 Introductory Geology 3
GEOL 110 Introductory Geology Laboratory 1 (PR: GEOL 100 or 101)

PSY 308 Social Psychology (PR: PSY 201, 202) 4
PSY 309 Personality Theory (PR: PSY 201, 202) 4
STAT 301 Fundamentals of Probability and Statistics (PR: MATH 110) 4

SOC 307 Sociology of Religion (PR: SOC 201) 4
SOC 312 Old World Prehistory (PR: SOC 310, 311, or consent of instructor) 4
SOC 313 New World Prehistory (PR: SOC 310, 311, or consent of instructor) 4
SOC 336 Social Stratification (PR: SOC 201) 4
SOC 353 Culture and Personality (PR: SOC 201) 4

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

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Studies Program</td>
<td>69</td>
</tr>
<tr>
<td>Basic (55)</td>
<td></td>
</tr>
</tbody>
</table>

Major Area Credits 48

Electives
Primarily to be selected from upper level courses outside the Department with the approval of the student's advisor.

TOTAL QTR. HOURS REQUIRED 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 noncredit. Off-campus offices are located at Brevard Community College in Cocoa and at Daytona Beach Community College in 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 by the University.

NONCREDIT ACTIVITIES

The University is offering an increased number of conferences, institutes, seminars, workshops and short courses which do not carry University credit. 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 by writing to Florida Technological University, Post Office Box 25000, Orlando, Florida 32816. The Continuing Education Office is located in Room 374 in the new Administration Building.

COOPERATIVE EDUCATION

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.

To enter and remain in the program, the student must have a “C” or better average. Interested students should go to Room 374 of the Administration Building for an application and further information.
COURSE DESCRIPTIONS

CLASSIFICATION OF COURSES

The University course numbering system is as follows:

100-299 are freshman and sophomore level courses and are designed primarily for these students.

300-499 are junior and senior level courses and are designed primarily for these and other advanced students. When approved for inclusion in an individual program of graduate study by a supervisory committee approved by the Dean of Graduate Studies, selected 300-499 courses may serve the needs of individual graduate students.

500-599 are beginning graduate and advanced undergraduate level courses - open to graduate students and those seniors who receive approval of the appropriate Dean(s).

600-699 are beginning graduate and professional level courses open only to graduate students.

SPECIAL COURSES

In addition to the regular courses listed in this bulletin, the following special courses may be available. Consult your academic advisor for details.

<table>
<thead>
<tr>
<th>Special Courses</th>
<th>Undergraduates</th>
<th>Grad</th>
<th>&amp; Prof.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Topics</td>
<td>491</td>
<td>591</td>
<td>691</td>
</tr>
<tr>
<td>Seminar</td>
<td>492</td>
<td>592</td>
<td>692</td>
</tr>
<tr>
<td>Special Readings</td>
<td>493</td>
<td>593</td>
<td>693</td>
</tr>
<tr>
<td>Independent Study</td>
<td>494</td>
<td>594</td>
<td>694</td>
</tr>
<tr>
<td>Research Methods</td>
<td>495</td>
<td></td>
<td>695</td>
</tr>
<tr>
<td>Research Planning</td>
<td>496</td>
<td></td>
<td>696</td>
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<tr>
<td>Research</td>
<td>497</td>
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<td>697</td>
</tr>
<tr>
<td>Research Report</td>
<td>498</td>
<td></td>
<td>698</td>
</tr>
<tr>
<td>Thesis</td>
<td>499</td>
<td></td>
<td>699</td>
</tr>
</tbody>
</table>

These courses may be assigned variable credit. Some may be repeated upon approval.

1 The Special Graduate Courses are primarily for graduate students, but may be taken by advanced seniors with the consent of their deans.

PR: PREREQUISITE

A requirement which must be satisfied prior to the listed course.

CR: COREQUISITE

A requirement which must be satisfied concurrently with the listed course.

C.I.: CONSENT OF INSTRUCTOR

AVAILABILITY OF COURSES

The University does not offer each year all of the courses listed in the catalog. The Class Schedule should be consulted for those courses offered each quarter.
ACCOUNTANCY

ACCY 111  Qtr. Hrs. - 4
Basic Concepts: Accounting as a device for measurement and control of business activity. An introduction to the basic concepts and principles; the analysis and recording of transactions; preparation of financial statements; accounting systems and procedures.

ACCY 112  Qtr. Hrs. - 4
Basic Concepts: PR: ACCY 111. A continuation of ACCY 111. Accounting for partnerships and corporations; managerial techniques such as cost control and budgeting.

ACCY 307  Qtr. Hrs. - 5
Accounting Concepts: 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 111, 112 sequence.

ACCY 308  Qtr. Hrs. - 5
Accounting for Engineers: 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  Qtr. Hrs. - 4

ACCY 312  Qtr. Hrs. - 5

ACCY 321  Qtr. Hrs. - 3
Cost Accounting: PR: ACCY 112 or 307. The elements of cost recording. The basic cost concept. The importance of cost determination and recording.

ACCY 322  Qtr. Hrs. - 3

ACCY 341  Qtr. Hrs. - 3

ACCY 411  Qtr. Hrs. - 3
Advanced Accounting: PR: ACCY 312. Complex cases in partnership formation, operation, expansion, and liquidation. Installation sales; consignments; home and branch relationships; mathematics of compound interest.

ACCY 412  Qtr. Hrs. - 3

ACCY 413  Qtr. Hrs. - 3
Advanced Accounting: PR: ACCY 312 or C.I. Cases of enterprises in distress; estates and trusts. Also a study of the general and special funds related to municipal accounting and non-profit organizations.

ACCY 433  Qtr. Hrs. - 3
Auditing: PR: ACCY 312. The audit concept. Understanding evidence as applied to the audit. Fundamental techniques, practices and procedures.

ACCY 434  Qtr. Hrs. - 3
Auditing II: PR: ACCY 433. A continuation of ACCY 331. A further examination of current auditing practices and procedures, including statistical sampling. Preparation of audit reports.

ACCY 451  Qtr. Hrs. - 3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ACCY 461</td>
<td>Computer Applications to Accounting Problems: PR: COMP 103 and ACCY 312. 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.</td>
<td>3</td>
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<tr>
<td>ACCY 601</td>
<td>Managerial Accounting: (Not open for accounting majors.) Accounting as an information and measurement system for internal planning and control; concepts and analytical techniques for accumulating costs of products and services.</td>
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<tr>
<td>AHS 100</td>
<td>Allied Health Sciences Orientation: A survey of the allied health sciences; opportunities and scope of the field.</td>
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<tr>
<td>AHS 320, 321</td>
<td>Hospital Organization and Administration: PR: Junior standing. Organization patterns in hospitals, clinics, and community health agencies, medical staff organization; principles and practices of administration.</td>
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<tr>
<td>AHS 340, 341</td>
<td>Introduction to Disease: Nature and cause of disease, treatment, and management of patients in major clinical areas of medicine.</td>
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<tr>
<td>AHS 350</td>
<td>Medical Legal Jurisprudence: Principles of law as applied to the health field with special reference to health practices.</td>
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<tr>
<td>AHS 375</td>
<td>Recent Advances in Medicine: A review of new discoveries and treatments in the medical field.</td>
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<tr>
<td>ART 201</td>
<td>Design Fundamentals I: Materials, processes, form. Application to product design, communication design, environmental design, and the visual arts. Stresses the value of planning and design in the development of a more humane civilization. Emphasis on two-dimensional design problems.</td>
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<tr>
<td>ART 202</td>
<td>Design Fundamentals II: Continuation of ART 201. Emphasis on color theory.</td>
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<tr>
<td>ART 203</td>
<td>Design Fundamentals III: Continuation of ART 202. Emphasis on three-dimensional design problems.</td>
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<tr>
<td>ART 211</td>
<td>Drawing Fundamentals I: Drawing as a means of formal organization. Introduction to problems in drawing methods and media. Emphasis on descriptive techniques.</td>
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<tr>
<td>ART 212</td>
<td>Drawing Fundamentals II: Continuation of ART 211. Emphasis on traditions of spatial organization.</td>
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<tr>
<td>ART 221</td>
<td>The History of Art I: Painting, sculpture, and architecture from the Prehistoric Era through the Medieval Period.</td>
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<tr>
<td>ART 222</td>
<td>The History of Art II: Painting, sculpture, and architecture from the Renaissance to the 19th Century.</td>
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<tr>
<td>ART 223</td>
<td>The History of Art III: Painting, sculpture and architecture of the 19th and 20th Centuries.</td>
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<tr>
<td>ART 231</td>
<td>Visual Arts Overview: An introduction to the visual design professions with emphasis on the study of the social, environmental, economic and cultural factors influencing the design disciplines and production in the fine arts.</td>
<td>3</td>
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</tbody>
</table>
ART 301  Qtr. Hrs. - 3

ART 302  Qtr. Hrs. - 3
Graphic Design: PR: Six quarters of Design Fundamentals or C.I. Recommended: ART 301. Fundamental principles of visual communication and of design in printed commercial material.

ART 305  Qtr. Hrs. - 3

ART 307  Qtr. Hrs. - 3
Design II: PR: Nine quarter hours in Design Fundamentals or C.I.

ART 308  Qtr. Hrs. - 3
Jewelry Design: PR: Consent of the instructor.

ART 311  Qtr. Hrs. - 3

ART 321  Qtr. Hrs. - 3
Arts of Pre-Literate Societies: The visual arts in recent and contemporary primitive societies with emphasis on the cultures of Africa and Oceania.

ART 322  Qtr. Hrs. - 3
Asian Art: An introduction to the history of visual arts of China, Japan, India and other Eastern cultures.

ART 324  Qtr. Hrs. - 3
History of Photography: The development of still photography in terms of its historical, aesthetic, and social impact on Western Culture from 1839 to the present.

ART 341  Qtr. Hrs. - 3
Photography: Consideration of basic technical and aesthetic factors in using still photography as a vehicle for visual, artistic expression.

ART 351  Qtr. Hrs. - 3
Painting: PR: Three quarter hours in Design Fundamentals and three quarter hours in Drawing Fundamentals or C.I.

ART 361  Qtr. Hrs. - 3
Printmaking: PR: Three quarter hours of Drawing Fundamentals or C.I. Basic procedure and processes in printmaking. Formal and expressive characteristics of the print media.

ART 371  Qtr. Hrs. - 3
Sculpture: PR: Six quarters in Design Fundamentals, to include three quarter hours in three-dimensional work, or C.I.

ART 381  Qtr. Hrs. - 3
Ceramics: PR: ART 203 or C.I. Basic concepts of ceramic design, experience in processes of forming, decorating, glazing, and firing pottery.

ART 391  Qtr. Hrs. - 3
Experiments in Art and Technology: PR: Consent of Instructor.

ART 402  Qtr. Hrs. - 3
Advanced Graphic Design: PR: ART 301 and ART 302. May be repeated for credit.

ART 405  Qtr. Hrs. - 3
Advanced Three-Dimensional Design: PR: ART 305. May be repeated for credit. Advanced problems in three-dimensional materials, processes, form.

ART 408  Qtr. Hrs. - 3
Advanced Jewelry Design: PR: ART 308. May be repeated for credit.

ART 411  Qtr. Hrs. - 3
Advanced Drawing: PR: ART 311. May be repeated for credit.

ART 425  Qtr. Hrs. - 4
Religious Symbolism in the Visual Arts: A study of the origin, migration, and transmutation of religious signs, symbols and images in the history of art. (Same as HUM 425.)
ART 433  Qtr. Hrs. - 3
Theory and Criticism of the Visual Arts: Criteria of criticism; analysis of works of art; elements of psychology and sociology of art; semantics of critical terminology; relation of aesthetic meaning to reality and truth; emphasis on developments in the arts of the 20th Century.

ART 434  Qtr. Hrs. - 3
Art and Technology: The impact of technological developments in the visual arts of the 20th Century.

ART 441  Qtr. Hrs. - 3
Advanced Photography: PR: ART 341. May be repeated for credit.

ART 451  Qtr. Hrs. - 3
Advanced Painting: PR: ART 351. May be repeated for credit.

ART 461  Qtr. Hrs. - 3
Advanced Printmaking: PR: ART 361. May be repeated for credit.

ART 471  Qtr. Hrs. - 3
Advanced Sculpture: PR: ART 371. May be repeated for credit.

ART 481  Qtr. Hrs. - 3
Advanced Ceramics: PR: ART 381. May be repeated for credit.

ART 482  Qtr. Hrs. - 3
Advanced Experiments in Art and Technology: PR: ART 391. May be repeated for credit.

ART 484  Qtr. Hrs. - 3
Senior Studio and Exhibition: PR: Senior standing and consent of the studio areas faculty. Required of all art majors with a studio concentration.
BIOL 100  Qtr. Hrs. - 4
General Biology: Basic principles emphasizing the unifying concepts of biology and their relationships to diversity in living organisms. Recommended for majors and preprofessional students. Not open to students with credit in BIOL 103.

BIOL 103  Qtr. Hrs. - 4
Biological Principles: An integrated approach to life processes and their relationships among diverse organisms, including man. Recommended for non-majors. Not open to students with credit in BIOL 100.

BIOL 105  Qtr. Hrs. - 4
Biology and Environment: PR: BIOL 100 or BIOL 103. Biological implications of the interaction among human society, population, and technology in relation to the environment and natural systems.

BIOL 330  Qtr. Hrs. - 3
Immunology: PR: MICR 300. Basic principles of the immune reaction; antigens, antibody formation, hypersensitivity and autoimmunity.

BIOL 331  Qtr. Hrs. - 2
Serology: PR: BIOL 330. Laboratory exercises in the production of antibodies, agglutination and precipitin reactions; quantitative techniques and isohemagglutination.

BIOL 332  Qtr. Hrs. - 5
Cell Physiology: PR: 11 hours in biological sciences and CHEM 123. Basic physiological processes, cellular organization, exchange of materials, conversion of energy, irritability and contractibility.

BIOL 350, 351  Qtr. Hrs. - 4, 4
Principles of Ecology: PR: 12 hours in biological sciences. A sequence of courses covering basic ecological processes. Weekend field trips are required.

BIOL 360  Qtr. Hrs. - 4
Genetics: PR: BIOL 100. Basic principles of heredity as applied to plants and animals. Laboratory will emphasize work with Drosophila.

BIOL 420  Qtr. Hrs. - 4
Cytology: PR: 11 hours in biological sciences and CHEM 123. Structure of vegetative and reproductive cells; cytoplasmic differentiation, mitosis, meiosis and chromosomal aberrations.

BIOL 450, 451, 452  Qtr. Hrs. - 3, 4, 3
Limnology: PR: BIOL 351 or C.I. A sequence of courses on the ecology of freshwater environments, including the interactions of biological, chemical and physical factors.

BIOL 460  Qtr. Hrs. - 3
Organic Evolution: PR: 11 hours in biological sciences including BIOL 360. An outline of evolutionary principles, natural selection and phylogeny; origin of variation and origin of species.

BIOL 470  Qtr. Hrs. - 3
History of Biology: PR: Junior standing. People and events from Aristotelian times to the present; development of the science of biology.

BOTANY

BOT 100  Qtr. Hrs. - 4
General Botany: PR: BIOL 100 or BIOL 103. Introduction to botany; plant structure and function, including a survey of the plant kingdom giving special emphasis to forms important to man.

BOT 270  Qtr. Hrs. - 3
Economic Botany: PR: BOT 100. Provides a broad understanding of the various plant groups and their economic importance to man; designed primarily for non-majors.

BOT 272  Qtr. Hrs. - 3
Plants and the Urban Environment: The selection, placement, propagation and care of ornamental plants in residential, commercial and industrial areas.

BOT 310  Qtr. Hrs. - 4
Botanical Microtechnique: PR: BOT 100. Methods for preparation and staining of plant materials for microscopic study.
BOT 320  Qtr. Hrs. - 5
Comparative Morphology of Plants: PR: BOT 100. A sequential survey of the algae, fungi, bryophytes, ferns, fern allies, gymnosperms and flowering plants, with emphasis on evolutionary relationships, structure and function.

BOT 325  Qtr. Hrs. - 4
Plant Anatomy: PR: BOT 100. A study of the development, structure and function of the principle organs and tissues of vascular plants.

BOT 330  Qtr. Hrs. - 5
Plant Physiology: PR: BIOL 332 or C.I. Chemical and physical activities of plants; absorption, transpiration, mineral nutrition, photosynthesis and growth.

BOT 340  Qtr. Hrs. - 4
Phycology: PR: BOT 320 or C.I. A lecture-laboratory course to survey the diversity and classification of marine, terrestrial and freshwater algae.

BOT 345  Qtr. Hrs. - 5
Plant Taxonomy: PR: BOT 100. An introduction to systematics, classification and identification of vascular plants with emphasis on the flora of peninsular Florida.

BOT 350  Qtr. Hrs. - 4
Plant Ecology: PR: BOT 345 or C.I. Role of soils and climate in relation to succession and composition of diverse plant communities.

BOT 442  Qtr. Hrs. - 4
Bryology: PR: BOT 320 or C.I. A lecture-laboratory survey course on the diversity and classification of mosses, liverworts and hornworts with special emphasis on those found in Florida.

BOT 443  Qtr. Hrs. - 4
Mycology: PR: BOT 320, MICR 200 or C.I. A lecture-laboratory course to cover the major groups of fungi, treating their morphology and classification and emphasizing those of special importance to man.

BOT 453  Qtr. Hrs. - 3
Plant Geography: PR: BIOL 350 or BOT 350. The major climatic plant formations of the world and historical plant geography.

BOT 470  Qtr. Hrs. - 4
Plant Pathology: PR: BOT 443 and MICR 200. A survey of the microorganisms causing plant diseases, emphasizing fungi, especially those forms which are important to Florida.

BOT 472  Qtr. Hrs. - 2

BOT 547  Qtr. Hrs. - 4
Field Botany: PR: 12 hours in biological sciences, or science teaching experience; or C.I. Classification and identification among lower and higher plant groups with emphasis on field experience. Major reference sources reviewed.
BUSINESS ADMINISTRATION

BADM 101 Qtr. Hrs. - 4
Business: 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 Qtr. Hrs. - 3
Business Concepts: 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 302 Qtr. Hrs. - 3
Personal Investments: PR: Junior standing. Management of personal finance; life insurance and home ownership as investments; owning a business as an investment; income protection; investable funds; vehicles for investment; financial institutions; aids to investment; investment companies. Cannot be used for credit for BSBA degree.

BADM 311, 312 Qtr. Hrs. - 3, 3
Mathematical Applications to Business: PR: MATH 115 or 221. A study of a wide range of quantitative decision procedures as applied to problems in business administration.

BADM 371 Qtr. Hrs. - 3
Business Law: PR: Junior standing. The presentation of law as an expanding social and political institution in the environment of the business enterprise. Consideration given to the development and sources of law, the judicial system, torts, crimes, and contracts.

BADM 372 Qtr. Hrs. - 3

BADM 373 Qtr. Hrs. - 3
Business Law: PR: BADM 371; BADM 372 desirable. A study of the legal concepts underlying the transfer and sale of goods and commercial paper, including an examination of the law of sales, commercial paper and secured transactions and their interaction with the commercial environment.

BADM 444 Qtr. Hrs. - 3
International Business Operation: PR: Senior standing or C.I. 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 Qtr. Hrs. - 3
Business Law, Interests in Property and Liability: PR: BADM 371 or C.I. Includes bailments, real and personal property, and security interests therein, insurance, suretyship and guaranty.

BADM 484 Qtr. Hrs. - 3
Operations Research: 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 485 Qtr. Hrs. - 4
Business Policies: PR: Senior standing and completion of all other business core course requirements, or C.I. 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 490 Qtr. Hrs. - 2
Senior Seminar: Business in Human Affairs: 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 601 Qtr. Hrs. - 3
Quantitative Analysis for Business Decisions: PR: Graduate standing. Quantitative techniques useful for the solution of business problems. Elements of calculus in addition to other mathematical techniques are employed. Mathematical model building to aid the decision-making process is stressed.
BADM 621  Qtr. Hrs. - 3
Business Policy and Responsibility: PR: Graduate standing. Functions and responsibilities of management, motivation of the businessman and factors governing business decisions.

CHEMISTRY

CHEM 100  Qtr. Hrs. - 1
Freshman Orientation: A discussion session to acquaint chemistry majors with the art, history, and current practice of chemistry.

CHEM 111  Qtr. Hrs. - 4
General Chemistry (Fundamentals): For the non-major, fundamental concepts are presented in a qualitative fashion; intended to develop an appreciation of chemistry rather than professional proficiency.

CHEM 112  Qtr. Hrs. - 3
General Chemistry (Organic): PR: CHEM 111. A survey of organic chemistry stressing its applications to our society. The chemistry of functional groups will be related to industrial and natural processes.

CHEM 113  Qtr. Hrs. - 3
General Chemistry (Biochemistry): PR: CHEM 112. A survey of the chemistry of living systems. A conceptual approach will be used in an effort to provide a rationale for the uniqueness of the chemical reactions associated with life.

CHEM 114  Qtr. Hrs. - 1
General Chemistry Laboratory I: PR: CHEM 111 or CHEM 161. Illustrations of some of the principles and techniques of inorganic and analytical chemistry.

CHEM 115  Qtr. Hrs. - 1
General Chemistry Laboratory II: PR: CHEM 112 and CHEM 114. For the non-major: an introduction to the chemical arts as practiced in the organic and biochemical fields.

CHEM 121, 122, 123  Qtr. Hrs. - 4, 3, 3
Organic Chemistry: 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  Qtr. Hrs. - 2
Organic Laboratory Techniques: PR: CHEM 121. An introduction to the laboratory techniques of organic chemistry including the preparation, reaction, and analysis of organic compounds.

CHEM 125  Qtr. Hrs. - 2
Organic Laboratory Techniques: 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 151  Qtr. Hrs. - 2
Basic Laboratory Skills: Development of basic analytical skills. Gravimetric, volumetric, colorimetric, and electro­metric techniques will be presented. Intended primarily for majors in the biological sciences.

CHEM 161, 162, 163  Qtr. Hrs. 3, 3, 3
Chemical Principles: 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  Qtr. Hrs. 3, 3, 3
Chemistry Fundamentals: CR: MATH 222. 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  Qtr. Hrs. - 4, 4
Analytical Laboratory Techniques: PR: CHEM 161 or CHEM 261, and CHEM 123; or CHEM 113. A lecture-laboratory course providing a working knowledge of analytical laboratory techniques. Classical and instrumental methods are examined with emphasis on selection of the preferred analytical method, performing the analysis, and interpreting the data obtained.
CHEM 355  Qtr. Hrs. - 4
Chemical Instrumentation for the Medical Laboratory: PR: CHEM 113 and CHEM 352; or C.I. A lecture-laboratory course designed to develop a working knowledge of the analytical instrumental techniques in the modern medical laboratory.

CHEM 361, 362  Qtr. Hrs. - 3, 3

CHEM 364, 365  Qtr. Hrs. - 2, 2
Physical Chemistry Laboratory: CR: CHEM 361 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  Qtr. Hrs. - 3, 3, 3
Physical Chemistry: 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 421, 422  Qtr. Hrs. - 3, 3

CHEM 431  Qtr. Hrs. - 3
Inorganic Chemistry: PR: CHEM 362 or CHEM 369. A discussion of descriptive inorganic chemistry based on various bonding theories, thermodynamics, and kinetics.

CHEM 441, 442, 443  Qtr. Hrs. - 3, 3, 3
Biochemistry: PR: CHEM 123, and CHEM 163 or CHEM 362. 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  Qtr. Hrs. - 2, 2
Biochemical Methods: 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  Qtr. Hrs. - 4
Analytical Laboratory Technique: PR: CHEM 352; and CR: CHEM 362 or CHEM 368. A lecture-laboratory course designed to give in depth coverage to modern methods of chemical analysis including electrochemistry, spectroscopy and chemical separations.

CHEM 452  Qtr. Hrs. - 4
Analytical Laboratory Techniques: PR: CHEM 451. A lecture-laboratory course in which students will be encouraged to propose qualitative and quantitative methods of analysis for various inorganic and organic materials. Specific instrumental techniques will also be covered.

CHEM 461  Qtr. Hrs. - 3

CHEM 471  Qtr. Hrs. - 3

CHEM 474  Qtr. Hrs. - 3
Radiochemical Techniques: PR: CHEM 351. A lecture-laboratory course stressing radiochemical handling techniques, radiation safety, and the detection and measurement of nuclear radiation.
CEES 321  Qtr. Hrs. - 3
Surveying: CR: Junior Standing. Theory and field practice in engineering, measurements, and the reduction and adjustment of data. Two lectures, three hours laboratory.

CEES 322  Qtr. Hrs. - 4
Engineering Geology: PR: ENGR 152. Basic principles of physical geology with emphasis on topics pertinent to analysis and engineering of soil deposition, geologic maps, weathering, groundwater, mass wasting, and earthquakes. Three lectures, three hours laboratory.

CEES 351  Qtr. Hrs. - 4

CEES 355  Qtr. Hrs. - 3
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and build-up members. Same as EMMS 355.

CEES 357  Qtr. Hrs. - 3
Structural Concrete Design: PR: ENGR 312. Principles of designing reinforced concrete members. Selected topics in concrete mixes, beams, columns, and ultimate analysis. Same as EMMS 357.

CEES 411  Qtr. Hrs. - 4

CEES 412  Qtr. Hrs. - 4
Environmental Engineering – Wastewater: PR: ENGR 332. Drainage systems, collection and transmission of wastewater, channel flow, biodegradation of organic wastes, principles of wastewater treatment, effluent and sludge handling and disposal.

CEES 414  Qtr. Hrs. - 4
Water and Wastewater Systems Design: PR: CEES 411 or 412. Planning capacity and design of water distribution systems, sanitary sewerage, storm drainage systems, water and wastewater treatment plants.

CEES 415  Qtr. Hrs. - 3
Atmospheric Pollution Control: PR: Senior standing. Atmospheric composition and dynamics, sources and nature of contaminants, toxicity thresholds and biological significance, engineering methods of measurement and control.

CEES 416  Qtr. Hrs. - 4
Public Health Engineering: PR: Senior standing. Selected topics in the occurrence and transmission of diseases, mathematical theory of epidemics, sanitation of the environment, vector control and public engineering and administration.

CEES 417  Qtr. Hrs. - 4
Environmental Health: PR: Senior standing. Selected topics in industrial hygiene, radiological health, effects of pollution on the natural environment, pollution control concepts and regulatory agencies.

CEES 431  Qtr. Hrs. - 4
Soil Mechanics and Foundation Engineering I: PR: ENGR 312. Study of the fundamental principles of soil behavior, properties, engineering, and characteristics, including bearing capacity and settlement. Basic applications to retaining walls, foundations, slope stability, etc. Project type laboratory exercises with emphasis on application of laboratory testing and results to practical problems. Three lectures, three hours laboratory-demonstrations.

CEES 432  Qtr. Hrs. - 4
Soil Mechanics and Foundation Engineering II: PR: CEES 431 or C.I. Continuation of CEES 431 with emphasis on strength and compressibility characteristics of soils, application to slope stability, earth dams, etc. Continuation of project type laboratory. Three lectures, three hours laboratory-demonstration.
CEES 451  Qtr. Hrs. - 4
Matrix Methods of Structural Analysis - I:  PR: CEES 351 or C.I. Structural analysis of beams, frames, and plates by matrix methods. Same as EMMS 441.

CEES 452  Qtr. Hrs. - 4
Matrix Methods of Structural Analysis - II:  PR: CEES 441. Extension of CEES 441 to include selected topics in stability, vibration, and limit analysis of beams, frames and plates. Same as EMMS 442.

CEES 461  Qtr. Hrs. - 3

CEES 462  Qtr. Hrs. - 3
Transportation Engineering:  PR: CEES 461. Advanced topics in transportation system analysis.

CEES 463  Qtr. Hrs. - 3
Traffic Engineering:  PR: CEES 461 and ENGR 371. Study of operator and vehicle characteristics, street capacity, signals, signs and markings. All phases of traffic engineering as applied to urban areas.

CEES 471  Qtr. Hrs. - 3

CEES 472  Qtr. Hrs. - 3
Urban Planning:  PR: CEES 471. Municipal organization and administration, public health, public utilities, services, zoning, replanning, critical studies.

CEES 501  Qtr. Hrs. - 3
Environmental Engineering – Chemistry I: Study of fundamental principles of physical and analytical chemistry applicable to treatment of water and wastewater. Chemical thermodynamics, chemical kinetics, chemical equilibria, water analysis. Two hours lecture and three hours laboratory.
CEES 502  Qtr. Hrs. - 3
Environmental Engineering – Chemistry II:  PR: CEES 501 or C.I. Continuation of CEES 501 to include study of fundamental principles of organic chemistry and biochemistry as applied to environmental quality control, biodegradation of wastes, and wastewater analysis. Two hours lecture and three hours laboratory.

CEES 518  Qtr. Hrs. - 3
Hydraulic Engineering: Application of principles of fluid mechanics to engineering problems. Topics include open channel flow, flow in conduits under pressure, hydraulic machinery, principles of reservoir planning, water supply systems, dams, spillways, and other hydraulic works.

CEES 521  Qtr. Hrs. - 3
Aerial Photographic Interpretation: PR: C.I. Geometrical principles, optics, photography, survey cameras, stereoscopic vision and measurement, interpretation, theory of image measurement, terrestrial photogrammetry, aerial photogrammetry, thermal imagery, fundamental projective relations, errors.

CEES 581  Qtr. Hrs. - 3
Water Resources Engineering: PR: C.I. Hydrology, hydraulics, pressure conduits, open channels, and uses of water. The economics and engineering of systems for control and utilization of water resources will be studied using systems analysis and operations research techniques.

CEES 582  Qtr. Hrs. - 3
Water Resources Economics: PR: CEES 581. General micro-economic concepts, benefits and costs from investment alternatives, external diseconomies, effluent charges, interest rates, design life, and case studies of foreign and domestic policies.

CEES 601  Qtr. Hrs. - 4
Unit Operations and Processes of Sanitary Engineering - I: Theory and design of physical, chemical, and biological operations and processes used in sanitary engineering.

CEES 602  Qtr. Hrs. - 4
Unit Operations and Processes of Sanitary Engineering - II: Continuation of CEES 601. Theory and design of physical, chemical, and biological operations and processes.

CEES 603  Qtr. Hrs. - 2
Unit Operations and Processes Laboratory: Laboratory exercises in physical, chemical, and biological processes.

CEES 604  Qtr. Hrs. - 3
Water and Wastewater Treatment Systems: Integration of unit operations and processes into treatment systems. Emphasis will be placed on functional, hydraulic, and economic design using computers.

CEES 611  Qtr. Hrs. - 4
Environmental Engineering – Water Supply: Water resources, hydrologic cycle, water quality, chemistry of natural water, water treatment, transmission, and distribution.

CEES 612  Qtr. Hrs. - 4
Environmental Engineering – Wastewater: Drainage systems, collection and transmission of wastewater, channel flow, biodegradation of organic wastes, principles of wastewater treatment, effluent and sludge handling and disposal.
CEES 614  Qtr. Hrs. - 3  Water and Wastewater Systems Design: Planning capacity and design of water distribution systems, sanitary sewerage, storm drainage systems, water and wastewater treatment plant.

CEES 615  Qtr. Hrs. - 3  Atmospheric Pollution Control: Atmospheric composition and dynamics, sources and nature of contaminants, toxicity thresholds and biological significance, engineering methods of measurement and control.

CEES 616  Qtr. Hrs. - 4  Public Health Engineering: Selected topics in the occurrence and transmission of diseases, mathematical theory of epidemics, sanitation of the environment, vector control, and public engineering and administration.

CEES 617  Qtr. Hrs. - 4  Environmental Health: Selected topics in industrial hygiene, radiological health, effects of pollution on the natural environment, pollution control concepts, and regulatory agencies.

CEES 618  Qtr. Hrs. - 3  Solid Wastes Management: Study of the extent and characteristics of the solid waste problem, collection and disposal systems, and environmental interfaces and effects.

CEES 681  Qtr. Hrs. - 4  Water Resources Systems I: PR: CEES 582. A comprehensive approach to planning controlling, and development of water resources systems. Applications of systems analysis and economic theory to water resources problems. Deterministic models are developed and solved. Case studies.


COMMUNICATION

COM 100  Qtr. Hrs. - 3  Basic Communication: 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 301  Qtr. Hrs. - 4  Communication as a Behavioral Science: Basic principles of the behavioral science approach to the study of contemporary communication.

COM 310  Qtr. Hrs. - 4  History of the Motion Picture: Development of the film industry, its social and economic impact. Same as THA 310.

COM 311  Qtr. Hrs. - 3  Business and Professional Communication: Investigation of the basic principles of communication as applied to business with emphasis on the written and oral communicative acts.

COM 312  Qtr. Hrs. - 4  Leadership Through Oral Communication: A theoretical and practical investigation of leadership in oral communication situations, principles of parliamentary law, and approaches to problem solving.

COM 313  Qtr. Hrs. - 4  Interpersonal Communication: Nature of the communication process: variables affecting the process and the individuals involved. Analysis of communication models, sender-receiver behavior, situational cues, verbal and nonverbal messages.
COM 319  
Basic Reporting: PR: C.I. and student must have a minimum ability to type. Development of skills in gathering and writing for the mass media.

COM 350  
Oral Communication For Television: PR: SPE 101. Practice and performance in speech preparation and delivery for television. Types of speeches include the television demonstrative, television stimulative and the television persuasive. All speeches are televised in the television laboratory.

COM 363  
Group Interaction and Decision-Making: A study of small-group interaction employing both general communication theory and small group theory. Attention is given to such group activities as development of discussion, leadership emergence, development of norms, etc.

COM 400  
Opinion and the Mass Media: 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 410  
Social Responsibilities of the Mass Media: Relationships between the mass media and society; examination of social and ethical responsibilities of the media.

COM 411  
Legal Responsibilities of the Mass Media: Legal rights and restrictions, including Constitutional guarantees; libel, invasion of privacy, and contempt of court.

COM 420  
Practicum in Communication: PR: C.I. May be repeated three times for credit.

COM 427  
Public Relations Campaigns: PR: COM 426. Planning and execution of a public relations campaign; use of research and coordination of elements of the campaign.

COM 428  
Institutional Public Relations: PR: COM 426 or C.I. Principles and methods of public relations as practiced by educational, medical and corporate-related institutions.

COM 429  
Mass Media and Popular Culture: An impact study of mass media upon American culture past to present.

COM 432  
The Mass Media in Developing Countries: Role of media in the world's developing areas, how the nations and media help shape the direction of one another.

COM 434  
Principles of Advertising: Fundamentals of advertising theory and practice, including social and economic aspects.

COM 435  
Advertising Media: PR: COM 434 or C.I. Evaluations of advertising media, their ability to serve the advertiser's communication needs and analysis used in determining media success.

COM 457  
Communications Internship: PR: C.I. Internships in radio, television, film, journalism, public relations, advertising and speech involving practicum at selected professional communications organizations 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.

COM 460  
Group Dynamics: A study of human behavior in group situations.

COM 462  
Persuasion: Attitude Formation and Change Formation: A survey of the immediate and direct ways in which persuasive communications and social groups come to influence attitudes.
COM 463  Qtr. Hrs. - 4  
Studies in Listening: Analysis of current trends, professional literature, and resource materials bearing upon the teaching of listening. Practice in listening; preparing listening experiences; oral and written reports.

COM 602  Qtr. Hrs. - 4  
Modern Communication Theory: Comparative analysis of theories and models of human communication: behavior systems, encoding and decoding processes, interaction variables, and social context.

COM 603  Qtr. Hrs. - 4  
Information and Educational Systems: PR: C.I. Sources, processing, and transmittal of educational and informational materials (software) used in educational broadcast systems, information retrieval systems, learning machines, etc.

COM 610  Qtr. Hrs. - 4  
Communication and National Development: An examination of the means by which communication has been used to aid in modernizing developing societies.

COM 612  Qtr. Hrs. - 4  
Comparative International Communication Organizations: A study of the principle mass communication organizations of the world.

COM 613  Qtr. Hrs. - 4  
Communication and Society: The importance of communications in societal stress situations, with emphasis on current problems.

COM 617  Qtr. Hrs. - 4  
Governmental Public Relations: PR: Consent of instructor. Emphasis study of campaign planning, image and public affairs activities of political aspirants and executive governmental offices at the city, county, state and federal levels.

COM 620  Qtr. Hrs. - 4  
Studies in Persuasion: Survey and evaluation of experimental research in persuasion.

COM 621  Qtr. Hrs. - 4  
Persuasion in the Media: Study of persuasive campaign with focus upon ethics, methodology, and strategies toward accomplishing the communication end.

COM 622  Qtr. Hrs. - 4  
Small Group Communication: PR: C.I. A study of communication and its effect on small group behavior.

COM 625  Qtr. Hrs. - 4  

COM 628  Qtr. Hrs. - 4  
Audience Measurement: PR: C.I. Examination and review of audience measurement techniques. Individual assignments for compilation and analysis of measurement data.

COM 630  Qtr. Hrs. - 4  

COM 635  Qtr. Hrs. - 4  
Legal Aspects of Mass Communication Law: PR: C.I. Further study into the legal rights and restrictions affecting the mass media.

COM 640  Qtr. Hrs. - 4  
Effects of Advertising on Society: An in-depth study of advertising's effects on consumer behavior, societal mores and media economics.
COMPUTER SCIENCE

COMP 101
Qtr. Hrs. - 3
Introduction to Computer Science: History of computers; description of a typical 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
Qtr. Hrs. - 3
Computer Programming: PR: MATH 110 or the equivalent. Problem definitions, algorithms, flow charts, digital computer programming using a higher level language (FORTRAN).

COMP 103
Qtr. Hrs. - 3
Computer Fundamentals for Business Applications: History of computers; processing information; manual information processing systems; introduction to electronic computer systems; storage of information; solving problems; preparation of common business reports.

COMP 205
Qtr. Hrs. - 3
Algorithmic Processes I: PR: COMP 102 or sophomore standing. Algorithms and computers, flow chart language, branching and subscripted variables, looping approximations; selected projects using a suitable procedure-oriented language.

COMP 206
Qtr. Hrs. - 3

COMP 207
Qtr. Hrs. - 3
Algorithmic Processes III: PR: COMP 205. Trees, compiling, text-editing, other non-numerical applications.

COMP 305
Qtr. Hrs. - 4
Assembly Language Programming Laboratory: PR: COMP 205. Computer structure and machine language; addressing techniques; digital representation of data; symbolic coding and assembly systems; selected programming techniques.

COMP 306
Qtr. Hrs. - 3

COMP 331
Qtr. Hrs. - 4
Introduction to Combinatorics and Graph Theory: PR: COMP 205 and a course in statistics. Recursion, permutations, combinations, generating functions, inclusion and exclusion, elements of the theory of directed and undirected graphs. Applications to computer science.

COMP 387
Qtr. Hrs. - 3
Computer Programming With Business Applications: PR: COMP 101 or COMP 102 or COMP 103. A study of computer languages of particular use in business and applications to business activities.

COMP 401, 402
Qtr. Hrs. - 3, 3
System Design: PR: COMP 305, EECS 311. Processor characteristics; peripheral equipment characteristics; information representation; introduction to data communications.

COMP 405
Qtr. Hrs. - 4
Data Structures: PR: COMP 305, 331. Basic concepts of data; linear lists, strings, arrays, and orthogonal lists; ordering or sorting techniques; recursion; string and list processing languages.

COMP 408
Qtr. Hrs. - 3
Programming Languages I: CR: COMP 331. Formal definitions of programming languages; global properties of algorithmic languages.

COMP 409
Qtr. Hrs. - 3
Programming Languages II: PR: COMP 408; CR: COMP 405. List processing, string manipulation, data description, and simulation languages.

COMP 411, 412
Qtr. Hrs. - 3, 3
Operating Systems: PR: COMP 306; CR: COMP 405. Task scheduling; file management; file security; multiprogramming; communication between system components, system logs, and accounting and status reporting.
COMP 421, 422
Quarter Hours - 3, 3
Compiler Structure:  PR: COMP 409; CR: COMP 405. A review of the major problem-oriented languages; syntax analysis bootstrapping techniques and metacompilers; 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
Quarter Hours - 3, 3, 3
Numerical Analysis: PR: COMP 206, MATH 321; CR: MATH 317 or MATH 318. Numerical solution of algebraic and transcendental equations, systems of equations, ordinary and partial differential equations, and integral equations; interpolation; finite differences; eigenvalue problems; relaxation techniques; approximations and error analysis.

COMP 471, 472, 473
Quarter Hours - 3, 3, 3
Mathematical Programming: PR: COMP 206, COMP 331, MATH 317 or MATH 318, and MATH 321; or C.I. Linear, nonlinear, and dynamic programming; applications in business, science and engineering.

COMP 481, 482
Quarter Hours - 3, 3
Computer Processing of Statistical Data: PR: COMP 102 and STAT 402, or C.I. The use of high-speed electronic computers in statistical analysis; approximation methods; error analysis; Monte Carlo calculations; simulation; combination problems, matrix calculations; least squares analysis; multiple regression; stepwise regression; nonlinear estimation; characteristic value problems; principal component analysis, factor analysis; analysis of variance and covariance computations.

COMP 484
Quarter Hours - 3
Health Information Systems: PR: COMP 103. A critical survey of the current status of health information systems, application of automated data processing techniques to the health field, and the manual systems needed to support them.

COMP 487, 488, 489
Quarter Hours - 3, 3, 3
Computer Processing of Business Data: PR: Junior standing and COMP 101 or COMP 102 or COMP 103. 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; on-line systems and controls.

COMP 501
Quarter Hours - 3

COOPERATIVE EDUCATION

COED 100
Cooperative Education, Freshman Year
Quarter Hours - 0*

COED 200
Cooperative Education, Sophomore Year
Quarter Hours - 0*

COED 300
Cooperative Education, Junior Year
Quarter Hours - 0*

COED 400
Cooperative Education, Senior Year
Quarter Hours - 0*

ECONOMICS

ECON 201
Quarter Hours - 3
Economics and Man: An introductory course specifically designed to provide both the business and nonbusiness student with a terminal course in the fundamentals of economics, including economic methodology, microeconomics, and macroeconomics.

ECON 202
Quarter Hours - 3
Principles of Microeconomics: PR: ECON 201. The determination of prices in a market economy; their role in allocating consumer and producer goods and in distributing incomes. Efficiency of markets and evaluation of public policies designed to improve efficiency.

*May be repeated.
ECON 203  
Introduction to Aggregate Economics: PR: ECON 201. A course providing further study in the area of national income accounting, income and employment theory, business fluctuations, and U.S. economic policy.

ECON 301  
Intermediate Price Theory: PR: ECON 202, 203. Theoretical analysis of the determination of product and factor prices under different market structures.

ECON 307  
Economic History of the United States: PR: Junior standing or C.I. An analysis of the historical growth and development of the American economy.

ECON 311  
Intermediate Money, Income and Employment Theory: PR: ECON 202, 203. Theoretical analysis of the determination of national income and employment, including an examination of the monetary system.

ECON 321  

ECON 328  

ECON 331  

ECON 332  
Manpower and Human Resources: PR: ECON 202, 203. Examines labor as a human resource or human capital. Special emphasis placed upon the changing role of manpower and manpower policies.

ECON 341  

ECON 361  
Agriculture in the American Economy: PR: ECON 202, 203. Agriculture in a developed economy. The nature of agricultural markets, their structure and national farm policy issues.

ECON 371  
Mathematical Economics: PR: ECON 203 and MATH 223. An introduction to the mathematical tools of modern economic analysis.

ECON 381  
Economics of Public Utilities: PR: ACCY 111, 112 or ACCY 307 and ECON 202, 203 or C.I. The nature of public utilities, the economics of rate determination, and regulatory policy.

ECON 401  
Managerial Economics: PR: ECON 202, 203. The uses of economic analysis in economic decision-making and business policy formulation.

ECON 411  
Comparative Economic Systems: PR: ECON 202, 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  

ECON 431  
Public Finance in the American Economy: PR: ECON 202, 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  Qtr. Hrs. - 3  
Fiscal Economics: 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 435  Qtr. Hrs. - 3  
Monetary Theory and Policy: PR: FIN 331. A study of the factors that influence the supply of and demand for money and credit, and the effect of changes in these factors on the allocation of resources, levels of national income, employment, and prices.

ECON 441  Qtr. Hrs. - 3  

ECON 451  Qtr. Hrs. - 3  

ECON 461  Qtr. Hrs. - 3  

ECON 471  Qtr. Hrs. - 3  
History of Economic Thought: PR: ECON 202, 203. A study of the leading ideas of the major contributors to the development of economic thought.

ECON 481  Qtr. Hrs. - 3  
Economics of Urban Areas: PR: ECON 202, 203. An analysis of the economic problems arising from and associated with the growth of cities and suburban areas within metropolitan districts.

ECON 611  Qtr. Hrs. - 3  
Aggregate Economics — Income, Employment, and Growth: 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.

ECON 621  Qtr. Hrs. - 3  
Statistics for Business and Economic Analysis: PR: Graduate standing. The use of advanced statistical methods in business decision-making. Emphasis will be on such topics as regression and correlation analysis, sampling procedures, and forecasting techniques.

ECON 643  Qtr. Hrs. - 3  
The Soviet Economy: Decision Making and Rationality: PR: Graduate standing. The course is designed to examine and analyze the functionality, structure, and operation of the economic system of the Soviet Union and of the East European command economies. Special emphasis will be given to rationality, decision-making, and the logic of planning.

BUSINESS EDUCATION — DEVELOPMENTAL

EDBE 101  Qtr. Hrs. - 3  
Introductory Typewriting: 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  Qtr. Hrs. - 3  
Communications Production - I: 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  Qtr. Hrs. - 3  
Communications Production - II: PR: EDBE 102 or equivalent. Expansion of communications production development, speed and accuracy.
EDBE 201  Qtr. Hrs. - 3  
Principles of Shorthand - I: 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  Qtr. Hrs. - 3  
Principles of Shorthand - II: PR: EDBE 102, and EDBE 201 or equivalents. A continuation in the study of shorthand theory, vocabulary development, and speed building.

EDBE 203  Qtr. Hrs. - 3  
Principles of Shorthand - III: PR: EDBE 102, and EDBE 202 or equivalents. Development and refinement of sustained shorthand dictation, speed and vocabulary development.

EDBE 301  Qtr. Hrs. - 3  
Shorthand Dictation: PR: EDBE 102, and EDBE 203 or equivalents. Continued development of shorthand dictation and introductory communications production.

EDBE 302  Qtr. Hrs. - 3  
Shorthand Transcription: PR: EDBE 102, and EDBE 301. Gregg Shorthand dictation and refinement of communications production.

EDBE 305  Qtr. Hrs. - 3  
Office Technology: PR: EDBE 102 or C.I. Basic operation and function of technological media in modern business offices.

EDBE 405  Qtr. Hrs. - 3  
Principles of Business - Vocational Education: 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  Qtr. Hrs. - 3  

EDBE 601  Qtr. Hrs. - 3  

EDBE 602  Qtr. Hrs. - 3  

EDBE 603  Qtr. Hrs. - 3  
Analysis, Trends and Research in Typewriting Instruction: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media; psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 604  Qtr. Hrs. - 3  
Evaluation in Business Education: Rank III Certificate or C.I. A study of standardized and prognostic business education tests; functions, construction, administration, and evaluation of measurement instruments.

EDBE 610  Qtr. Hrs. - 3  
Administration and Supervision of Business Education: PR: Rank III Certificate or C.I. Organization, administration, and supervision of Business Education.

EDBE 611  Qtr. Hrs. - 3  
Analysis of Instruction in Shorthand and Transcription: PR: Rank III Certificate or C.I. Techniques, materials, and instructional media, psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

EDBE 612  Qtr. Hrs. - 3  
Analysis of Instruction in Office Technology: PR: Rank III Certificate or C.I. Techniques, materials and instructional media, psychological principles, evaluation, and special attention to a study of research and new trends of instruction.
### EDBE

**EDBE 613**  
Qtr. Hrs. - 3  
**Analysis of Instruction in Basic Business and Accounting:** PR: Rank III Certificate or C.I. Techniques, materials, and instructional media, psychological principles, evaluation, and special attention to a study of research and new trends of instruction.

**EDBE 614**  
Qtr. Hrs. - 3  
**Coordination of Cooperative Office Business Education:** PR: Rank III Certificate or C.I. A study of cooperative programs; organization and coordination of cooperative business education programs.

**EDBE 615**  
Qtr. Hrs. - 3  
**Improvement of Related Instruction in Cooperative Business Education:** PR: Rank III Certificate or C.I. Techniques, materials, and instructional media, psychological principles, evaluation, and special attention to the study of research and new trends of instruction in related cooperative education study.

### ELEMENTARY EDUCATION — DEVELOPMENTAL

**EDEL 301**  
Qtr. Hrs. - 3  
**Teaching Mathematics in the Elementary School:** PR: Admission to Phase II or C.I. Consideration of selected concepts; organizing for instruction, techniques and activities; class and individual diagnosis; remedial procedures.

**EDEL 302**  
Qtr. Hrs. - 3  
**Mathematics Programs in the Elementary School:** PR: EDEL 301. Analysis of teaching arithmetic, geometry and measurement; philosophy and objectives; instructional materials; current research and new curricula.

**EDEL 306**  
Qtr. Hrs. - 3  
**Music in the Elementary School:** Fundamental procedures for teaching elementary school music, stressing appropriate music materials and activities for different age groups; selected experiences in music.

**EDEL 307**  
Qtr. Hrs. - 3  
**Literature for Children:** PR: Admission to Phase II or C.I. 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**  
Qtr. Hrs. - 3  
**Basic Foundations of Reading:** PR: Admission to Phase II or C.I. Introduction to reading; principles, procedures and organization, current practices; analysis of reading materials; correlation with child development; investigation of research.

**EDEL 312**  
Qtr. Hrs. - 3  
**Reading in the Elementary School:** 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**  
Qtr. Hrs. - 3  
**Teaching Science in the Elementary School:** PR: Admission to Phase II or C.I. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

**EDEL 316**  
Qtr. Hrs. - 3  
**Elementary School Curriculum:** 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**  
Qtr. Hrs. - 3  
**Teaching Social Science in the Elementary School:** PR: Admission to Phase II or C.I. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

**EDEL 318**  
Qtr. Hrs. - 3  
**Teaching Physical Education in the Elementary School:** PR: EDTA 206 and 307. Organization, practice, and conduct of elementary school physical education with emphasis on teaching methods.
EDEL 401  Qtr. Hrs. - 3
Programs in Early Childhood Education: PR: Admission to Phase II or C.I. 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  Qtr. Hrs. 3
Language Arts in Early Childhood Education: PR: Admission to Phase II or C.I. Analysis of content of values and developmental role of language arts programs; application of instructional techniques; curriculum problems relating to reading readiness, perception and cognition.

EDEL 403  Qtr. Hrs. - 3
Language and Cognition of Young Children: PR: Admission to Phase II or C.I. 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  Qtr. Hrs. - 3
Organization of Instruction in Nursery-Kindergarten Education: PR: EDEL 401 or 402. Organization of instruction and methods in areas relating to social science, science, mathematics, health, creative arts, and physical education; development of creative manipulative devices. Concurrent laboratory experiences.

EDEL 405  Qtr. Hrs. - 5
Language Arts in the Elementary School: PR: Admission to Phase II or C.I. Content, principles, materials and techniques involved in teaching speaking, listening, writing, and spelling in the elementary school; organizing for instruction.

EDEL 406  Qtr. Hrs. - 3
Art in the Elementary School: Basic principles, purposes, scope and sequence; organization for instruction; evaluation of activities; selected art experiences.

EDEL 407  Qtr. Hrs. - 3
Classroom Diagnosis and Treatment of Reading Difficulties: PR: EDEL 311 or 312 or equivalent. 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  Qtr. Hrs. - 3
Science Programs in the Elementary School: PR: Admission to Phase II or C.I. Overview of the instructional program in natural sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 409  Qtr. Hrs. - 3
Social Science Programs in the Elementary School: PR: Admission to Phase II or C.I. Overview of the instructional program in the social sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 415  Qtr. Hrs. - 3
Teaching Elementary School Health and Physical Education: PR: Admission to Phase II or C.I. Observation, organization, practice, and conduct of health and physical education activities in the elementary school.

EDEL 455  Qtr. Hrs. - 4
Elementary School Curriculum: PR: Bachelor's degree or C.I. 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  Qtr. Hrs. - 2-5, 2-5
Directed Study in Elementary Education: Workshop for the improvement of the elementary school curriculum. Open to in-service teachers.

EDEL 530  Qtr. Hrs. - 4
Developmental Reading: PR: Rank III Certificate or C.I. Principles, procedures, organization, and current practices in the elementary reading program.

EDEL 535  Qtr. Hrs. - 3
Classroom Diagnosis and Treatment of Reading Difficulties: PR: EDEL 530 or equivalent. Principles and techniques of classroom diagnosis and corrective teaching in reading. Consideration of instructional materials.

EDEL 604  Qtr. Hrs. - 3
Leadership in Elementary Education: PR: Rank III Certificate or C.I. Current issues with emphasis on the improvement of instruction, analysis of curriculum, and staff development procedures.
EDEL 605  Qtr. Hrs. - 3
Problems in Classroom Teaching in the Elementary School: PR: Rank III Certificate or C.I. Identification and analysis of relevant major instructional problems in the elementary school.

EDEL 606  Qtr. Hrs. - 3
Curriculum Design in Elementary Education: PR: Rank III Certificate or C.I. Design and construction of programs to meet needs of varying levels of student populations. (May be repeated.)

EDEL 607  Qtr. Hrs. - 3
Practicum in Elementary Education: PR: Rank III Certificate or C.I. Supervised laboratory experiences including individual and small group instructional procedures. (May be repeated.)

EDEL 610  Qtr. Hrs. - 3
Trends in Elementary School Science Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in mathematics education research.

EDEL 620  Qtr. Hrs. - 3
Trends in Elementary School Mathematics Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in mathematics education research.

EDEL 621  Qtr. Hrs. - 3
Diagnosis of Difficulties in Elementary School Mathematics: PR: EDEL 620. Study and uses of tests regarding the symptoms and causes of specific learning skills in mathematics.

EDEL 622  Qtr. Hrs. - 3
Remediation of Difficulties in Elementary School Mathematics: PR: EDEL 621. Selection of materials and techniques for a remedial program based on individual diagnosis.

EDEL 630  Qtr. Hrs. - 3
Trends in Elementary School Reading Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in reading research.

EDEL 632  Qtr. Hrs. - 3
Corrective Reading for Classroom Teachers I: PR: EDEL 535 or equivalent. A practicum for classroom teachers with emphasis on group diagnostic reading tests and classroom corrective techniques.

EDEL 633  Qtr. Hrs. - 3
Corrective Reading for Classroom Teachers II: PR: EDEL 632 or equivalent. A continuation of EDEL 632.

EDEL 635  Qtr. Hrs. - 3
Diagnosis of Difficulties in Reading: PR: EDEL 535 or equivalent. Administration and interpretation of individual tests. Consideration of physical, psychological and environmental factors contributing to reading difficulties.

EDEL 636  Qtr. Hrs. - 4
Diagnostic Reading Practicum: PR: EDEL 635 or equivalent. Evaluation of reading abilities and difficulties of children in the reading laboratory of the University. Preparation of individual case reports.

EDEL 637  Qtr. Hrs. - 4
Remedial Reading Practicum: PR or CR: EDEL 636. Supervised remedial instruction with individual children. Selection of instructional materials and techniques; preparation of case progress reports; parent interviews.

EDEL 640  Qtr. Hrs. - 3
Trends in Elementary School Language Arts Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in language arts research.

EDEL 641  Qtr. Hrs. - 3
Investigation in Children's Literature: PR: Rank III Certificate or C.I. Analysis of the various approaches available for learning through the utilization of children's literature.

EDEL 650  Qtr. Hrs. - 3
Trends in Elementary School Social Science Education: PR: Rank III Certificate or C.I. Analysis of historical development and current trends in social science education research.
EDEL 681  Qtr. Hrs. - 3
Seminar in Early Childhood Education: PR: Rank III
Certificate or C.I. Study and evaluation of research applicable to the design and construction of a curriculum for 3, 4 and 5 year old children.

LIBRARY SCIENCE

EDLS 301  Qtr. Hrs. - 3
Library Materials: A general introduction to the selection, acquisition, processing, and use of all types of library materials.

EDLS 321  Qtr. Hrs. - 3
Library Organization and Administration I: 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.

EDLS 322  Qtr. Hrs. - 3
Library Organization and Administration II: PR: EDLS 321 or equivalent. Continuation of EDLS 321.

EDLS 334  Qtr. Hrs. - 4

EDLS 384  Qtr. Hrs. - 3
History of Books and Libraries: A history of books and libraries from ancient times to the present, in relation to the society of which they were a part.

EDLS 424  Qtr. Hrs. - 3
School Library Administration: PR: C.I. Principles and practices of library administration applied to elementary and secondary school libraries.

MUSIC EDUCATION

EDME 401  Qtr. Hrs. - 3
Elementary School Music Instructional Analysis: PR: EDTA 206 and EDTA 307. Instructional planning; sources of information; instructional techniques; and special evaluation procedures in elementary school music.

EDME 402  Qtr. Hrs. - 3
EDPE 323  
Instructional Analysis in Team Sports: PR: Sophomore standing. Analysis of neuromuscular performances and optimal approach to specific learning patterns in team sports.

EDPE 324  
Instructional Analysis in Tennis: Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 325  
Instructional Analysis in Aquatics: Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 326  
Instructional Analysis in Gymnastics and Tumbling: Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 327  
Instructional Analysis in Golf: Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 328  
Instructional Analysis in Wrestling (M): Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 329  
Choreography of Contemporary Dance (W): Dance production as an art form.

EDPE 330  
Instructional Analysis of Rhythms: PR: Sophomore standing. Analysis of rhythm and rhythmic activities as they relate to teaching physical education.

EDPE 350  

EDPE 360  
School and Community Recreation: PR: Admission to Phase II or C.I. Knowledge and skills of after school activity and summer recreational programs.

EDPE 407  
Family Living Concepts: The ideas and principles of healthy family living.

EDPE 408  
Contemporary Health Hazards: The effects of drugs and other mood modifiers.

EDPE 410  

EDPE 421  
Exercise Physiology - Cardiovascular: PR: ZOOL 224. A circulatory study of man's homeostatic regulation during environmental stress. (Includes lecture and laboratory.)

EDPE 422  

EDPE 430  
Human Performance Learning: PR: Admission to Phase II or C.I. Theories of movement and factors influencing the learning of gross and fine motor skills. (Includes lecture and laboratory.)

EDPE 440  
Rehabilitation Training Techniques: PR: Admission to Phase II or C.I. Recognition and rehabilitation of sports injuries, including first aid.

EDPE 450  
Organization and Administration of Physical Education: PR: EDSE 380. Administering and organizing for instruction of the physical education class and the total school physical education program.
EDPE 601  
Philosophical Foundations of Physical Education: PR: Rank III Certificate or C.I. Analysis of the forces and events leading to the development of current concepts in physical education.

EDPE 602  

EDPE 603  
Organization and Design of Physical Education Programs: PR: Rank III Certificate or C.I. Study of physical education and its existing organization. Emphasis on ethics, values, principles and issues.

EDPE 612  
Primate Gross Anatomy Dissection: PR: Rank III Certificate or C.I. Dissection, identification, and analysis of select vertebrate morphology.

EDPE 621  
Physiology of Exercise - Environmental: PR: Rank III Certificate or C.I. A study of physiological adaptation resulting from prescribed physical activity programs.

EDPE 624  
Rhythms: PR: Rank III Certificate or C.I. Instructional analysis in classical and modern rhythms.

EDPE 631  

EDPE 632  
Perceptual Motor Development: PR: EDTA 614 or C.I. Study of the relationship between perceptual motor development and learning. Evaluation of physical activities designed to improve perceptual motor skills.

EDPE 660  
School Recreation: PR: Rank III Certificate or C.I. A study of recreational programs related to the public schools.

EDPE 680  
Kinesiologic Analysis of Individual Activities: PR: Rank III Certificate or C.I. Analytical techniques of kinesiology and their methods of application to individual motor activities.

EDPE 681  
Kinesiologic Analysis of Team Activities: PR: Rank III Certificate or C.I. Analytical techniques of kinesiology and their methods of application to team motor activities.

PROFESSIONAL LABORATORY APPLICATION

EDPL 320  
Elementary School Student Teaching - Block A: PR: EDTA 206 and EDTA 307. Junior year student teaching in an elementary school under the supervision of a certified classroom teacher.

EDPL 321  
Elementary School Student Teaching - Block B: PR: EDPL 320. Junior year student teaching in an elementary school under the supervision of a certified classroom teacher.

EDPL 330  

EDPL 408  
Teaching Strategies: 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: PR: Bachelor's degree or C.I. 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 421 Qtr. Hrs. - 9
Elementary School Student Teaching - Block C: PR:
EDPL 321. Senior year student teaching in an elementary
school under the supervision of a certified classroom
teacher.

EDPL 430 Qtr. Hrs. - 9
Secondary School Student Teaching - Block C: PR:
EDPL 330. Senior year student teaching in a secondary
school under the direction of a certified classroom
teacher.

EDPL 465, 466 Qtr. Hrs. - 5, 5
Teaching Practicum: 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.

EDPL 558 Qtr. Hrs. - 4
Supervision of Professional Laboratory Experiences: PR: C.I. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the Teacher Education Associate or Supervising Teacher.

SECONDARY EDUCATION — DEVELOPMENTAL

EDSE 303 Qtr. Hrs. - 3

EDSE 305 Qtr. Hrs. - 3
Secondary School Curriculum: PR: EDTA 206 and EDTA 307. Study of total school patterns with emphasis on new trends, including subject areas, administration, supervision, school services and school related activities.

EDSE 310 Qtr. Hrs. - 4
Speech Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of instructional programs in speech; objectives, materials, techniques, organization for instruction, evaluation procedures, current research.

EDSE 320 Qtr. Hrs. - 3
Foreign Language as Human Behavior: PR or CR: ENG 371 or C.I. Nature of language, objectives of foreign language learning and introduction to teaching basic skills. One hour laboratory required each week.

EDSE 321 Qtr. Hrs. - 4
Foreign Language Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching foreign language.

EDSE 330 Qtr. Hrs. - 4

EDSE 340 Qtr. Hrs. - 4
English Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching English.

EDSE 350 Qtr. Hrs. - 4
Mathematics Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching mathematics.

EDSE 360 Qtr. Hrs. - 4
Science Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching science.

EDSE 370 Qtr. Hrs. - 4
Social Science Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of instructional programs in Social Sciences; objectives; materials; techniques; organization of instruction; evaluation procedures; current research.
EDSE 380  Qtr. Hrs. - 4
Physical Education Instructional Analysis: PR: EDTA 206 and EDTA 307. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching physical education.

EDSE 404  Qtr. Hrs. - 3
Instructional Techniques: PR: EDPL 330, CR: EDPL 408 and EDPL 430. Procedures, applications and evaluation of technical skills a teacher may employ in the classroom.

EDSE 421  Qtr. Hrs. - 3
Oral Teaching of Foreign Languages: PR: EDPL 330 or C.I. Audio-lingually-based demonstration class. Practice in linguistic methods. One hour laboratory required each week.

EDSE 431  Qtr. Hrs. - 3

EDSE 432  Qtr. Hrs. - 3

EDSE 440  Qtr. Hrs. - 3
Teaching Language and Composition: PR: EDTA 206 and EDTA 307. Techniques and methods in teaching of dialects, semantics, the various grammars. A survey of composition rhetorical methods of selected authors.

EDSE 441  Qtr. Hrs. - 3
Literature for Adolescents: PR: Senior standing or C.I. Selecting and evaluating books for adolescents with emphasis on the uses of literature in the development of young people.

EDSE 442  Qtr. Hrs. - 4
Reading in the Secondary School: PR: Senior standing or C.I. Developmental reading for the junior and senior high school pupil.

EDSE 451  Qtr. Hrs. - 3

EDSE 461  Qtr. Hrs. - 3
Biology Laboratory Teaching: PR: Senior standing. Participation in introductory level chemistry laboratory. Includes laboratory set-ups, laboratory staff meetings and a weekly seminar.

EDSE 462, 463  Qtr. Hrs. - 2, 2
Chemistry Laboratory Teaching: PR: Senior standing. Participation in introductory level chemistry laboratory. Includes laboratory set-ups, laboratory staff meetings and weekly seminar.

EDSE 464, 465  Qtr. Hrs. - 2, 2
Physics Laboratory Teaching: PR: Senior standing. Participation in introductory level physics laboratory. Includes laboratory set-ups, laboratory staff meetings and a weekly seminar.

EDSE 471  Qtr. Hrs. - 3
Trends in Secondary School Social Science: PR: Senior standing. Identification, development and evaluation of major social science concepts as they relate to contemporary school programs.

EDSE 521  Qtr. Hrs. - 3

EDSE 541  Qtr. Hrs. - 3

EDSE 551  Qtr. Hrs. - 3
Topics in Junior High School Mathematics: PR: Rank III Certificate or C.I. Instructional techniques and major problems in junior high mathematics programs.
<table>
<thead>
<tr>
<th>Course</th>
<th>Type</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDSE 561</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>General Science Programs in the Secondary School: Rank III Certificate or C.I. Basic concepts, philosophies, and formats of experimental secondary school general science programs (may be repeated.)</td>
</tr>
<tr>
<td>EDSE 562</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>High School Biology Concepts: Rank III Certificate or C.I. Major concepts in BSCS biology and other modern biology programs.</td>
</tr>
<tr>
<td>EDSE 571</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Contemporary Social Science Education: Rank III Certificate or C.I. A survey of recent developments and contemporary programs in all areas of the social sciences.</td>
</tr>
<tr>
<td>EDSE 601</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Curriculum Planning: Rank III Certificate or C.I. Developing of a theory and formulating a basic instructional plan for the classroom teacher.</td>
</tr>
<tr>
<td>EDSE 602</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Principles of Educational Supervision: Rank III Certificate or C.I. Basic theory and application of supervising principles for instructional improvement.</td>
</tr>
<tr>
<td>EDSE 621</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Media and Research in Foreign Language Teaching: Rank III Certificate or C.I. Rationale and use of technological aides in foreign language teaching, classroom research and evaluation.</td>
</tr>
<tr>
<td>EDSE 641</td>
<td>Qtr. Hrs.</td>
<td>4</td>
<td>Media and Methods in English Education: Rank III Certificate or C.I. Practicum in the use of various media in the English classroom with emphasis on student film making and production of media.</td>
</tr>
<tr>
<td>EDSE 642</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Reading Guidance for Adolescents: Rank III Certificate or C.I. Review of literary works appropriate for young people to provide insight into psychological problems common to teenagers.</td>
</tr>
<tr>
<td>EDSE 651</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Laboratory Programs in Mathematics: Rank III Certificate or C.I. Design, organization and development of special materials and projects for mathematics independent study.</td>
</tr>
<tr>
<td>EDSE 652</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Seminar in Mathematics Teaching: Rank III Certificate or C.I. A review of prominent research and the writings of selected authors in mathematics education.</td>
</tr>
<tr>
<td>EDSE 661</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Inquiry in the Sciences: Rank III Certificate or C.I. The techniques in teaching science by inquiry in the secondary school with the opportunity to participate in and develop inquiry lessons.</td>
</tr>
<tr>
<td>EDSE 662</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Laboratory Programs in Science Education: Rank III Certificate or C.I. Rank III or C.I. Design, organization and development of special materials and projects for science independent study centers.</td>
</tr>
<tr>
<td>EDSE 671</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Laboratory Programs in the Social Sciences: EDSE 571 or C.I. Design, organization and development of special materials related to selected conceptual specializations.</td>
</tr>
<tr>
<td>EDSE 672</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Inquiry in the Social Studies: Rank III or C.I. An in-depth development of the role of inquiry in the new social studies with opportunity to both participate in and to develop inquiry episodes.</td>
</tr>
</tbody>
</table>

**TEACHING ANALYSIS**

<table>
<thead>
<tr>
<th>Course</th>
<th>Type</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA 206</td>
<td>Qtr. Hrs.</td>
<td>3</td>
<td>Human Development: Analysis of basic principles and applications in growth and learning from conception through adolescence. EDTA 307 recommended concurrently.</td>
</tr>
</tbody>
</table>
EDTA 305  
**Principles of Evaluation:** PR: Successful completion of Teaching Analysis, (EDTA 307) and Human Development, (EDTA 206). Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306  
**Learning Theory:** PR: Successful completion of Teaching Analysis, (EDTA 307) and Human Development, (EDTA 206). Study of applications of learning theory to classroom teaching.

EDTA 307  
**Teaching Analysis:** 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 490  
**Senior Seminar: Education in Human Affairs:** 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 601  
**Fundamental Research Procedures in Education:** PR: Rank III Certificate or C.I. Design rationale and construction, sampling methods, control and limits.

EDTA 611  
**Social Factors in American Education:** PR: Rank III Certificate or C.I. Analysis of general and specific aspects of American education as they relate to Social and Behavioral Sciences.

EDTA 612  
**Measurement and Evaluation in Education:** PR: Rank III Certificate or C.I. Rationale and construction of evaluative instruments, parametric and non-parametric statistics, interpretation of data.

EDTA 613  
**Behavior Problems in the Public School:** PR: Rank III Certificate or C.I. Role of the teacher in identification, strategies for remediation and referral procedures for working with behavioral problem children. Mental hygiene principles stressed.

EDTA 614  
**Studies in Human Development and Childhood:** PR: Rank III Certificate or C.I. Recent research in Human Development and childhood relevant to contemporary American education. Emphasis prenatal through age 11.

EDTA 615  
**Studies in Teaching Analysis:** PR: Rank III Certificate or C.I. Usage and analysis of micro-teaching, verbal and non-verbal approaches, social and behavioral variables influencing classroom learning.

EDTA 616  
**Techniques of Game Use in Education:** PR: Rank III Certificate or C.I. Analysis, development, and use of educational games as an approach to classroom teaching.

EDTA 617  
**Adolescent Development and the Schools:** PR: Rank III Certificate or C.I. Recent research in human development in adolescence with special emphasis upon research of interest to secondary school teachers.

EDTA 618  
**Instructional Models and Learning Theories in Education:** PR: Rank III Certificate or C.I. Recent research and theoretical analysis of instruction-learning interfaces as they relate to learning in the schools.

**EDUCATION – VISUAL ARTS**

EDVA 401  
**Elementary School Art Instructional Analysis:** PR: EDTA 206 and EDTA 307 or C.I. Methods and curriculum materials appropriate for teaching Visual Arts in the elementary schools.
EDVA 402  Qtr. Hrs. - 3
Secondary School Art Instructional Analysis: PR:
EDTA 206 and EDTA 307 or C.I. Methods and curric-
ulum materials for teaching Visual Arts in the secondary
schools.

EDVA 431  Qtr. Hrs. - 3
Two-Dimensional Instructional Materials: PR: EDVA
401 or 402 or C.I. Application of two-dimensional
materials to appropriate levels of instruction: chalk, ink,
water color, crayon, tempera, acrylics, paper, fiber, and
oils.

EDVA 432  Qtr. Hrs. - 3
Three-Dimensional Instructional Materials: PR: EDVA
401 or 402 or C.I. Application of three-dimensional
materials to appropriate levels of instruction: wood,
paper, plaster, stone, clay, wax, fiber, metal, and syn-
thetics.

EDVA 433  Qtr. Hrs. - 3
Graphic Instructional Materials: PR: EDVA 401 or 402
or C.I. Application of graphic materials to appropriate
level of instruction: direct and indirect basic processes of
reproduction of mono and multi-printing.

EDVA 501  Qtr. Hrs. - 3
Contemporary Visual Arts Education: PR: EDVA 401
and EDVA 402 or C.I. A study of current programs and
innovations in public school Visual Arts Programs.

EDVA 502  Qtr. Hrs. - 3
Found Arts: PR: EDVA 431 and EDVA 432 or C.I.
Materials available for instruction in the public schools
will be explored in depth in relation to their appropriateness
and productive qualities.

EDVA 601  Qtr. Hrs. - 3
Two-Dimensional Instructional Materials: PR: EDVA
401, 402, and 431, or C.I. Application of two-dimensional
materials to appropriate levels of instruction: chalk, ink,
water color, crayon, tempera, acrylics, paper, fiber, and
oils.

EDVA 602  Qtr. Hrs. - 3
Three-Dimensional Instructional Materials: PR: EDVA
401, 402, 432, or C.I. Application of three-dimensional
materials to appropriate levels of instruction: wood,
paper, plaster, stone, clay, wax, fiber, metal, and syn-
thetics.

EDVA 603  Qtr. Hrs. - 3
Graphic Instructional Materials: PR: EDVA 401, 402,
and 433, or C.I. Application of graphic materials to
appropriate level of instruction: direct and indirect basic
processes of reproduction of mono and multi-printing.

ELECTRICAL ENGINEERING AND
COMMUNICATIONS SCIENCES

EECS 311  Qtr. Hrs. - 4
Introduction to Digital Circuits: PR: COMP 205. Intro-
duction to electrical components used in digital switching
circuits and to the properties of magnetic materials;
construction of basic logic gates and flip-flops; consider-
ation of various practical problems including reliability,
noise and packaging techniques. Intended primarily for
computer science majors. Three lectures, three hours
laboratory.

EECS 321  Qtr. Hrs. - 4
Electrical Networks: PR: ENGR 321. Analysis of linear
circuits. Laplace and Fourier transform techniques. State
variable representation. Computer aided analysis tech-
niques. Three lectures, three hours laboratory.

EECS 322  Qtr. Hrs. - 4
Electronic Engineering: PR: ENGR 322. Electronic
devices and circuits including small signal amplifiers,
power amplifiers, and switching circuits. Three lectures,
three hours laboratory.

EECS 331  Qtr. Hrs. - 3
Electromechanics: PR: ENGR 323. Energy conversion
by electromechanical methods.

EECS 341  Qtr. Hrs. - 4
Electromagnetic Fields: PR: ENGR 322 and MATH
331. Introduction to electrical fields and waves.

EECS 412  Qtr. Hrs. - 4  Logical Systems Design: PR: EECS 411. Systems investigation, design, and operation of digital computers; study of a basic hardware set and a basic software set.

EECS 413  Qtr. Hrs. - 4  Digital Systems and Circuits: PR: EECS 411. Investigation of integrated circuit digital subsystems and their incorporation into circuits for digital applications. Three lectures, three hours laboratory.


EECS 421  Qtr. Hrs. - 3  Electrical Networks: PR: EECS 321 and 341. Traveling electromagnetic waves with application to distributed parameters. Two lectures, three hours laboratory.

EECS 431  Qtr. Hrs. - 3  Electrical Machinery: PR: EECS 331. Methods and techniques of systems analysis applied to the dynamics of electrical machinery. Two lectures, three hours laboratory.

EECS 442  Qtr. Hrs. - 4  Microwaves: PR: EECS 341. Microwave devices and systems and measurement techniques. Three lectures, three hours laboratory.


EECS 513  Qtr. Hrs. - 4  Pulse Circuits: PR: Basic electronics course. Wave generating, shaping, and logic circuits. Three lectures, three hours laboratory.

EECS 531  Qtr. Hrs. - 3  Environmental Control Systems: PR: ENGR 421 or equivalent. Modeling, control methods, stability, and optimization applied to environmental systems.

EECS 535  Qtr. Hrs. - 3  Electric Power Generation and Distribution: PR: ENGR 323 or equivalent. Introduction to electric energy sources. Concept of complex power in single and three phase systems. Synchronous machines, power transformer, and transmission lines.

EECS 543  Qtr. Hrs. - 3  Coherent Optics Applications: PR: PHYS 354. Theory and design of coherent optical systems lasers, information, processing, communication, holography.


EECS 611  Qtr. Hrs. - 3  Modern Circuit Design: Application of computer aided methods for the analysis and synthesis of passive and active networks.
EECS 613  Qtr. Hrs. - 3
Digital Circuits: Analysis of logic circuits, design of
digital systems using contemporary integrated circuits,
laboratory project.

EECS 621  Qtr. Hrs. - 3
Digital Computer Systems: PR: EECS 613. Investigation
of general purpose computer systems and their com­
ponents.

EECS 625  Qtr. Hrs. - 3
Computer Simulation of Environmental Systems: PR:
EECS 531 or equivalent. Modeling environmental systems
using digital, analog, and hybrid computer techniques.

EECS 631  Qtr. Hrs. - 3
Modern Control Theory: State space method of analysis
for discrete and continuous control, phase plane,
Lyapunov stability.

EECS 632  Qtr. Hrs. - 3
tion, control restraints, initial and target states.
Pontryagin's theorem, time, fuel, and energy optimiza­
tion.

EECS 633  Qtr. Hrs. - 3
Nonlinear Control Systems: PR: EECS 631. Analysis
and synthesis techniques for nonlinear systems, stability
classifications, limit cycles, Popov's theorem. State vari­
able description.

EECS 645  Qtr. Hrs. - 3
Remote Sensing Optical Systems: PR: EECS 341 or
equivalent. Study of electromagnetic phenomena and
systems at optical and near optical wavelengths and the
use of such systems in environmental monitoring.

EECS 651  Qtr. Hrs. - 3
Signal and System Analysis: Representation of signals
and linear systems in the frequency and time domains,
transforms, sampling, random signals.

EECS 653  Qtr. Hrs. - 3
Communication Theory: Theory of communicating in
the presence of noise, modulation, optimum filtering,
phase-lock loop.

ENGINEERING CORE

ENGR 100  Qtr. Hrs. - 4
Oceanography and Space: Fundamentals of ocean­
ography and space with emphasis on the engineering
aspects and uses. May be used to satisfy Scientific
Environment requirement of Environmental Studies Pro­
gram.

ENGR 101  Qtr. Hrs. - 3
Engineering Graphics: Spatial visualization, sketching,
and graphical presentation as a form of engineering
communication. Engineering drawing, descriptive geo­
metry, manipulation of vectors and graphical solution
techniques. Two lectures, one two-hour laboratory.

ENGR 103  Qtr. Hrs. - 3
Creative Design: PR: Approval of instructor. Role of the
engineer as a creative design professional. Emphasis on
understanding the creative process and factors that in­
fluence 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  Qtr. Hrs. - 4
Engineering Concepts: CR: MATH 221. Introduction
to the basic physical phenomena essential to the un­
derstanding of engineering structures, machines, processes,
and systems. Primary emphasis on mechanics, materials
behavior, and thermofluid mechanics phenomena.
Lecture, demonstration, and recitation.

ENGR 151, 152  Qtr. Hrs. 3, 3
Chemical Foundations of Engineering: PR: Satisfactory
performance in one year of high school chemistry or
physics. CR: MATH 211. Engineering applications of
basic chemical concepts. Atomic and molecular structure,
states of matter and their energies, chemical equilibria and
reaction rates, organic compounds, and industrial pro­
cesses. Lecture, demonstration, recitation.

ENGR 201  Qtr. Hrs. - 1
Engineering Design Case Studies: PR: Sophomore stand­
ing and ENGR 103. Discussion of the role of various
engineering disciplines in the creative design process.
Invited guest speakers will review pertinent case studies
covering a broad spectrum of engineering problems.
ENGR 211  Qtr. Hrs. - 4
Engineering Analysis - Statics: PR: ENGR 111 and MATH 222. Fundamental concepts of mechanics including resultants of force systems, free-body diagrams, equilibrium of rigid bodies, and analyses of structures.

ENGR 221  Qtr. Hrs. - 4
Electrical Science: PR: MATH 223 and ENGR 111. General concepts of electricity and magnetism; the development of fundamental laws of electrical engineering; the introduction of the basic circuit elements. Lecture and discussion.

ENGR 311  Qtr. Hrs. - 4
Engineering Analysis - Dynamics: PR: ENGR 211 and MATH 223. Kinematics and kinetics of particles and rigid bodies; mass and acceleration, work and energy, and impulse and momentum.

ENGR 312  Qtr. Hrs. - 5

ENGR 321  Qtr. Hrs. - 4
Principles of Electrical Engineering: PR: ENGR 221; CR: MATH 331. Introduction to fundamental laws of electrical circuits, including transient, steady-state AC, and general network analysis. Lecture, demonstration, and laboratory.

ENGR 322  Qtr. Hrs. - 4

ENGR 323  Qtr. Hrs. - 4
Electrical Devices and Systems: PR: ENGR 322. Electromagnetic energy conversion devices, feedback amplifiers, and instrumentation. Lecture, demonstration, and laboratory.

ENGR 331  Qtr. Hrs. - 3

ENGR 332  Qtr. Hrs. - 4

ENGR 341  Qtr. Hrs. - 3

ENGR 342  Qtr. Hrs. - 3

ENGR 351  Qtr. Hrs. - 3

ENGR 352  Qtr. Hrs. - 3
Materials of Engineering: PR: ENGR 351. Chemical, mechanical and electrical properties of materials; structure and properties of engineering alloys; lecture, demonstration, and laboratory.

ENGR 361  Qtr. Hrs. - 3
Man and His Environment: 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  Qtr. Hrs. - 3
Probability and Statistics for Engineers: PR: MATH 223. 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 403  Qtr. Hrs. - 3
Senior Creative Design: PR: Senior standing. Application of the fundamental engineering design algorithm to design synthesis and inventiveness methods culminating in an individual or group engineering design project.

ENGR 421  Qtr. Hrs. - 3
Linear Control Systems: PR: MATH 331, ENGR 332. Theoretical and experimental study of the dynamics of linear, lumped parameter models of mechanical, electrical, fluid, thermal and mixed systems as applied to control systems.

ENGR 431  Qtr. Hrs. - 3

ENGR 441  Qtr. Hrs. - 3
Technical Communications: PR: Junior standing. Composition for technical papers, reports and scientific articles suitable for publication. Oral and written presentation.

ENGR 442  Qtr. Hrs. - 3

ENGR 443  Qtr. Hrs. - 3
Engineering Administration: PR: ENGR 341 and senior standing. Engineering organization and administration; delegation of authority and responsibility; effective utilization of resources; compensation structure, labor-management relations; selected case studies.

ENGINEERING - INTERDISCIPLINARY COURSES

ENGR 481  Qtr. Hrs. - 3
Man and Machine: The influence and interrelationship of invention and technical progress on the evolution of social forms and institutions.

ENGR 482  Qtr. Hrs. - 3
Engineering & Technology in History: Important developments in engineering and technology and their effect on society and our socio-economic processes and institutions.

ENGR 483  Qtr. Hrs. - 3
Technology and Social Change: 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  Qtr. Hrs. - 3
Science in History: Examination of the reciprocal relations of science and society from ancient to recent times.

ENGR 485  Qtr. Hrs. - 3
Topics in Urban Development: Production, distribution, and consumption of various commodities and engineering relationships to distribution, internal structure, and function of urban developments. Interrelationship of engineering, social, economic, and cultural phenomena.

ENGR 486  Qtr. Hrs. - 3
Science, Engineering, and Ethical Systems: 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  Qtr. Hrs. - 3
Historical Architecture: 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 488  Qtr. Hrs. - 3
Man and Environment: PR: Permission of instructor. A discussion of environmental factors of importance to man, man's interaction with the environment, engineering and non-engineering measures to insure improvement and maintenance of environmental quality. Not intended for engineering students.
ENGR 489  Qtr. Hrs. - 3  
Computers, Cybernetics and Society:  The effects of computers and the cybernetic revolution on the individual and society. Effects of positive and negative feedback on biological, technological, and social systems. Computers and their interactions with human system.

ENGR 490  Qtr. Hrs. - 2  
Engineering in Human Affairs:  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.

ENGINEERING MATHEMATICS 
AND COMPUTER SYSTEMS

EMCS 423  Qtr. Hrs. - 3  
Mathematics Review for Engineers:  Comprehensive review of college algebra, trigonometry, analytical geometry, vector calculus, and an introduction to differential equations for non-current engineering students wishing to pursue advanced work.

EMCS 430  Qtr. Hrs. - 3  

EMCS 431, 432, 433  Qtr. Hrs. - 3, 4, 4  

EMCS 434  Qtr. Hrs. - 3  
Computing Methods in Automatic Control:  PR: ENGR 421. Design, analysis, and implementation of computer based control systems, including analog, digital, and on-line schemes for process identification and control.

EMCS 471, 572  Qtr. Hrs. - 3, 3  
Engineering Mathematical Analysis:  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.

EMCS 530  Qtr. Hrs. - 3  
Engineering Data Reduction:  PR: ENGR 371. Methods for processing and analysis of scientific test and process data, including computer filtering schemes and data compression and recovery techniques.

EMCS 532  Qtr. Hrs. - 3  

EMCS 573  Qtr. Hrs. - 3  
Analytical Methods in Engineering:  PR: EMCS 471 or C.I. 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 electrical potential.

EMCS 574  Qtr. Hrs. - 3  

EMCS 575  Qtr. Hrs. - 3  
EMMS ENGINEERING MECHANICS AND MATERIALS SCIENCES

EMMS 351 Qtr. Hrs. - 4

EMMS 355 Qtr. Hrs. - 3
Structural Steel Design: PR: ENGR 312. Design of steel structural members. Selected topics in beam design, column design, plastic design, connections and built-up members. Identical to CEES 355.

EMMS 357 Qtr. Hrs. - 3

EMMS 411 Qtr. Hrs. - 3

EMMS 412 Qtr. Hrs. - 3

EMMS 413 Qtr. Hrs. - 3
Thermodynamic Properties of Materials: PR: ENGR 351. Fundamental concepts of thermodynamics and kinetics are applied to the study of solid state phase transformations, equilibrium in multicomponent systems and diffusion in solids.

EMMS 414 Qtr. Hrs. - 3

EMMS 421 Qtr. Hrs. - 3
Theory of Crystalline Solids: PR: ENGR 351. Modern theory of crystalline materials. Topics treated include crystal structure, mechanical, thermal and transport properties.

EMMS 430 Qtr. Hrs. - 3

EMMS 433 Qtr. Hrs. - 3

EMMS 434 Qtr. Hrs. - 3
Experimental Techniques for Materials: PR: ENGR 351. Theoretical and experimental study of the application of optical microscopy, X-ray diffraction and electron microscopy for materials analysis. Two lectures and two hours laboratory.

EMMS 435 Qtr. Hrs. - 3
Structure and Properties of Ceramics and Polymers: PR: ENGR 351. Structure of vitreous and crystalline non-metals; mechanical, thermal, and electrical properties of ceramics; structure and properties of organic polymers and composite materials.

EMMS 441 Qtr. Hrs. - 4
Matrix Methods of Structural Analysis I: PR: EMMS 351 or C.I. Structural analysis of beams frames, and plates by matrix methods. Same as CEES 451.
EMMS 442 Qtr. Hrs. - 4
Matrix Methods of Structural Analysis II: PR: EMMS 441. Extension of EMMS 441 to include selected topics in stability, vibration, and limit analysis of beams, frames and plates. Same as CEES 452.

EMMS 501 Qtr. Hrs. - 3
Electron Microscopy of Crystalline Materials: PR: ENGR 351, or C.I. Introduction to the optics of the electron microscope, electron and electron diffraction contrast mechanisms in foils containing lattice defects and second phases, evaluation of methods of specimen preparation including thin foils and replicas; emphasis on the interpretation of images and diffraction effects.

EMMS 511 Qtr. Hrs. - 3
Phase Transformation in Solids: PR: ENGR 351 or C.I. Principles of phase transformations, including precipitation, recrystallization, eutectoids, and martensite; emphasis on the understanding of the thermodynamic and kinetic processes underlying these phenomena.

EMMS 541 Qtr. Hrs. - 4
Intermediate Mechanics of Materials: PR: ENGR 312 and MATH 331. Stress and strain at a point; failure theories; elements of plane elasticity; curved beams; bending and torsion of thin-walled structures; theory of thin plates.

EMMS 600 Qtr. Hrs. - 3
Physical Metallurgy: PR: EMMS 433 or C.I. Theoretical examination of the basic metallurgical processes; diffusion, nucleation and growth, recovery and recrystallization; phase transformation; survey of recent advances in the field.

EMMS 610 Qtr. Hrs - 3
Mechanical Metallurgy: PR: EMMS 414. Theoretical treatment of solid solution hardening, strain hardening, and precipitation hardening; survey of recent advances in the field.

EMMS 621 Qtr. Hrs. - 3
Advanced Dynamics: PR: EMCS 471 or equivalent. The study of the dynamics of particles and rigid bodies from an advanced viewpoint. Virtual work principle, Lagrange's and Euler's equations of motion and Hamilton's principle applied to engineering problems.

EMMS 643 Qtr. Hrs. - 3

ENGLISH

ENG 101 Qtr. Hrs. - 3
Composition I: 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 Qtr. Hrs. - 3
Composition II: 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 Qtr. Hrs. - 3
Current Literature: PR: ENG 101 or equivalent. Writing practice based on readings in contemporary prose and poetry selected to invite the interest of students in literature.

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 208 Qtr. Hrs. - 3
Principles of Creative Writing: For freshman and sophomore students. An exploratory course in the several types of creative writing; group analysis of original writing; critical reading of established authors. May be repeated for credit.
ENG 210  Qtr. Hrs. - 3
Principles of Literature: Literary terms, forms, and types, illustrated in a wide variety of readings.

ENG 211  Qtr. Hrs. - 3
Survey of English Literature to 1625

ENG 212  Qtr. Hrs. - 3
Survey of English Literature, 1626-1798

ENG 213  Qtr. Hrs. - 3
Survey of English Literature, 1798-1914

ENG 300  Qtr. Hrs. - 3
Expository Writing: 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  Qtr. Hrs. - 3
Professional Report Writing I: Emphasis on clear expository writing of memoranda, reports and articles in the student's particular field.

ENG 302  Qtr. Hrs. - 3
Creative Writing Workshop I: PR: C.I. Practice in established forms: essay, short story, and poetry.

ENG 303  Qtr. Hrs. - 3
Creative Writing Workshop II: PR: ENG 302 or C.I. Individualized practice in writing in one of the established forms; analytic study of the work of pertinent authors.

ENG 304  Qtr. Hrs. - 3
Creative Writing Workshop III: PR: ENG 302 or C.I. Individualized practice in writing in one of the established forms; students who have completed ENG 303 will be expected to do intensive work in a different form from that practiced in the course; analytic study of the work of pertinent authors.

ENG 305  Qtr. Hrs. - 3
English Versification: Intensive study of the structural characteristics of English poetry, metrical systems, rhyme, scansion, and poetic rhetorical devices.

ENG 310  Qtr. Hrs. - 3
Professional Report Writing II: Instruction and practice in scientific writing including preparation of scientific reports in the student's particular field.

ENG 311  Qtr. Hrs. - 3
Survey of American Literature, 1588-1865

ENG 312  Qtr. Hrs. - 3
Survey of American Literature, 1865-1914

ENG 313  Qtr. Hrs. - 3
Survey of American Literature Since 1914

ENG 314  Qtr. Hrs. - 3
Survey of British Literature Since 1914

ENG 316  Qtr. Hrs. - 3
Continental European Fiction Since 1900: A selection of significant works of fiction written in various languages during the present century, read in translation.

ENG 321  Qtr. Hrs. - 3
Exploring Poetry: A broad, cultural approach to poetry, with emphasis upon the major themes and preoccupations of poets of all ages.

ENG 361  Qtr. Hrs. - 3
Practical Criticism: Student evaluation of selected fiction, poetry, and drama through practical exercises in literary criticism.

ENG 371  Qtr. Hrs. - 3

ENG 401, 402, 403  Qtr. Hrs. - 3, 3, 3
Senior Writing Workshop I (Non-fiction): 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 404, 405, 406</td>
<td>Senior Writing Workshop II (Fiction)</td>
<td>3, 3, 3</td>
<td>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.</td>
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<tr>
<td>ENG 407, 408, 409</td>
<td>Senior Writing Workshop III (Verse)</td>
<td>3, 3, 3</td>
<td>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.</td>
</tr>
<tr>
<td>ENG 410</td>
<td>Contributions of Minority Groups to American Literature</td>
<td>3</td>
<td>Contributions of linguistic and ethnic groups of non-English origin to the literature of the United States.</td>
</tr>
<tr>
<td>ENG 421</td>
<td>English Renaissance Literature I</td>
<td>3</td>
<td>Elizabethan poetry and prose, 1558-1603.</td>
</tr>
<tr>
<td>ENG 422</td>
<td>English Renaissance Literature II</td>
<td>3</td>
<td>Jacobean and Caroline Poetry and prose, 1603-1642.</td>
</tr>
<tr>
<td>ENG 423</td>
<td>English Renaissance Literature III</td>
<td>3</td>
<td>Commonwealth poetry and prose, 1642-1660, including Milton.</td>
</tr>
<tr>
<td>ENG 424</td>
<td>Studies in Restoration English Literature</td>
<td>3</td>
<td>Literature of the Restoration.</td>
</tr>
<tr>
<td>ENG 425</td>
<td>English Literature, 1700-1745</td>
<td>3</td>
<td>Prose and poetry of the first half of the 18th Century.</td>
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<tr>
<td>ENG 426</td>
<td>English Literature, 1745-1798</td>
<td>3</td>
<td>Prose and poetry of the last half of the 18th Century.</td>
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<tr>
<td>ENG 428</td>
<td>Studies in 19th Century English Literature II</td>
<td>3</td>
<td>English literature from 1832 to 1870: the early Victorians.</td>
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<tr>
<td>ENG 429</td>
<td>Studies in 19th Century English Literature III</td>
<td>3</td>
<td>English literature from 1870 to 1914: later Victorians and transitional writers.</td>
</tr>
<tr>
<td>ENG 430</td>
<td>Chaucer</td>
<td>3</td>
<td>The Canterbury Tales, Troilus and Criseyde, and other works.</td>
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<tr>
<td>ENG 431</td>
<td>Shakespeare's Comedies</td>
<td>3</td>
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<td>ENG 432</td>
<td>Shakespeare's Histories</td>
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<tr>
<td>ENG 433</td>
<td>Shakespeare's Tragedies</td>
<td>3</td>
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<tr>
<td>ENG 434</td>
<td>Milton</td>
<td>3</td>
<td>Paradise Lost, Paradise Regained, Samson Agonistes, shorter poems, and selected prose.</td>
</tr>
<tr>
<td>ENG 441</td>
<td>English Drama to 1642 (exclusive of Shakespeare)</td>
<td>3</td>
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<tr>
<td>ENG 442</td>
<td>Restoration and 18th Century English Drama</td>
<td>3</td>
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<tr>
<td>ENG 444</td>
<td>The British Novel in the 18th Century</td>
<td>3</td>
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<tr>
<td>ENG 445</td>
<td>The British Novel in the 19th Century</td>
<td>3</td>
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<tr>
<td>ENG 446</td>
<td>The American Novel in the 19th Century</td>
<td>3</td>
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<tr>
<td>ENG 451</td>
<td>British and American Fiction Since 1900</td>
<td>3</td>
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<tr>
<td>ENG 452</td>
<td>British and American Poetry Since 1900</td>
<td>3</td>
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</tbody>
</table>
ENG 453  Qtr. Hrs. - 3
British and American Drama Since 1900

ENG 460  Qtr. Hrs. - 3
Historical Survey of Literary Criticism: Study of the major critics from classical antiquity through the modern era.

ENG 461  Qtr. Hrs. - 3
British Literary Criticism to 1900: PR: ENG 460. Study of the major critics in England from the Renaissance through the Victorian period.

ENG 462  Qtr. Hrs. - 3
British Literary Criticism Since 1900: PR: ENG 460. Study of the important critical theories and principles developed in England from the Edwardian era to the present.

ENG 463  Qtr. Hrs. - 3

ENG 471  Qtr. Hrs. - 3

ENG 472  Qtr. Hrs. - 3
History of the English Language: PR: ENG 371. Study of the English language and its development from Anglo-Saxon to Modern English. Attention given to Old, Middle, and Early Modern English grammar and syntax.

ENG 473  Qtr. Hrs. - 3
Transformational Grammar: PR: ENG 371, 471. Introduction to philosophical basis of Transformational Grammar. Students will develop grammar for modern English.

ENG 520  Qtr. Hrs. - 4
Studies in Contemporary Fiction: Fiction of the last 20 years in the United States and Britain.

ENVIRONMENTAL STUDIES

PHYSICAL EDUCATION

The Environmental Studies Physical Education Program is designed to enhance the physical and mental development of the student. A student may receive three quarter hours credit toward graduation by enrolling and satisfactorily completing any one of the following courses:

ESPE 301  Qtr. Hrs. - 3
Aquatics: 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  Qtr. Hrs. - 3
Body Development (M)

ESPE 303  Qtr. Hrs. - 3
Body Development (W): A study and application of the metabolic, neuromuscular, and cardiovascular changes resulting from select physical activities. (2 hours lecture, 2 hours activity.)

ESPE 304  Qtr. Hrs. - 3
Golf: 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  Qtr. Hrs. - 3
Tennis: 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  Qtr. Hrs. - 3
Life Saving: Instruction, training and certification in basic life saving swimming skills. (2 hours lecture; 2 hours activity.)

ESPE 307  Qtr. Hrs. - 3
Scuba Diving: 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  Qtr. Hrs. - 3
Interpretive Dance: Instruction and analysis of creative dance performance as an art form. (2 hours lecture; 2 hours activity.)

FINANCE

FIN 301  Qtr. Hrs. - 5
Finance: PR: ACCY 112 or ACCY 307, ECON 202, 203. Fundamentals of obtaining and administering funds to meet short-term and long-term capital requirements.

FIN 311  Qtr. Hrs. - 4
Risk and Insurance: PR: Junior Standing or C.I. Principles and methods of risk reduction and specialization, with particular emphasis on insurance.

FIN 321  Qtr. Hrs. - 4
Investments: PR: FIN 301 or C.I. Principles and methods of risk reduction and specialization, with particular emphasis on insurance.

FIN 331  Qtr. Hrs. - 4
Money and Banking: PR: ECON 203 or C.I. 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  Qtr. Hrs. - 4
Real Estate: PR: Junior standing. Basic principles of real estate ownership, its use and transfer, brokerage, management, legislation, and importance to the economy.

FIN 411  Qtr. Hrs. - 4
Financial Institutions: PR: FIN 301. The operation of financial institutions and an analysis of their role in the economy.

FIN 421  Qtr. Hrs. - 4
Security Analysis: PR: FIN 301 and FIN 321. The problems of selecting securities for various investment purposes.

FIN 431  Qtr. Hrs. - 4

FIN 601  Qtr. Hrs. - 3

FIN 611  Qtr. Hrs. - 3
Working Capital and Financial Problems: PR: Graduate standing. Managing cash, receivables and inventories; sources of short-term funds; and special problems such as expansion, contraction, merger and failure.

FIN 621  Qtr. Hrs. - 3

FIN 631  Qtr. Hrs. - 3
Analysis of Investment Opportunities: PR: Graduate standing. Gives the student a basis for critically evaluating practices of professional investors and introduces him to analytical methods for selecting and timing securities purchases and sales.

FOREIGN LANGUAGES

FL 323  Qtr. Hrs. - 4
Comparative World Literature I: Masterworks of world literature in translation from the Book of Job to Cervantes. Authors represented include Homer, Sophocles, Cicero, Virgil, St. Augustine, Dante, Chaucer, Montaigne, and Shakespeare.

FL 324  Qtr. Hrs. - 4
Comparative World Literature II: Continuation of FL 323, from the Renaissance to the 20th Century, including works by Pascal, Milton, Rousseau, Goethe, Wordsworth, Poe, Balzac, Chekou, Baudelaire, Yeats, Mann, and Camus. Need not be taken in sequence with FL 323.
### FRENCH

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Quarter Hours</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRE 101</td>
<td>3</td>
<td>Elementary French Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to French culture.</td>
</tr>
<tr>
<td>FRE 201</td>
<td>3</td>
<td>Intermediate French Language and Civilization: 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.</td>
</tr>
<tr>
<td>FRE 203</td>
<td>3</td>
<td>Intermediate French Language and Civilization: PR: FRE 202 or equivalent. Continuation of FRE 202 with greater emphasis on French civilization from the Middle Ages to the present.</td>
</tr>
<tr>
<td>FRE 301</td>
<td>4</td>
<td>French Composition: 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.</td>
</tr>
<tr>
<td>FRE 303</td>
<td>4</td>
<td>French Conversation: PR: FRE 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.</td>
</tr>
<tr>
<td>FRE 311</td>
<td>3</td>
<td>Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance.</td>
</tr>
<tr>
<td>FRE 312</td>
<td>3</td>
<td>Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works of the seventeenth and eighteenth centuries.</td>
</tr>
<tr>
<td>FRE 313</td>
<td>3</td>
<td>Survey of French Literature: PR: FRE 203 or equivalent. Main literary currents and works of the nineteenth and twentieth centuries.</td>
</tr>
<tr>
<td>FRE 401</td>
<td>2</td>
<td>French Phonetics and Diction: PR: FRE 303 or equivalent. French phonology with emphasis on phonic groupings.</td>
</tr>
<tr>
<td>FRE 422</td>
<td>3</td>
<td>Seventeenth Century French Theater: PR: FRE 312. Corneille, Racine, and Moliere. A study of the life and principal works of the authors.</td>
</tr>
<tr>
<td>FRE 442</td>
<td>3</td>
<td>Nineteenth Century French Literature: PR: FRE 313. Realism and naturalism.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Title</td>
<td>Credits</td>
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<tr>
<td>FRE 451</td>
<td>Twentieth Century French Literature: Contemporary French drama and poetry.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>FRE 481</td>
<td>Stylistics: PR: FRE 301 or equivalent. An intense study of textual criticism. An examination of the relationship between language and literature; explications and linguistic analysis of literary texts.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GEOL 100</td>
<td>Introductory to Geology: CR: GEOL 110. A survey of physical and historical geology with an introduction to basic scientific principles and methods. Designed for non-science majors; appropriate for the Environmental Studies Program.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Physical Geology: PR: Any one of the following: GEOL 100, ENGR 151, CHEM 161, or PHYS 208. CR: GEOL 111. The earth's inorganic materials and the processes by which they interact: crystals, minerals, rocks, volcanism, earthquake activity, erosion, sedimentation, glaciation, mountain-building, drifting of continents, movements of the sea-floor, origin of landforms. Lunar geology is also considered.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GEOL 102</td>
<td>Historical Geology: PR: GEOL 100 or GEOL 101, CR: GEOL 112. Evolution of the earth and of life on the earth as reconstructed from geologic evidence and fossil remains. Emphasis on North America, but other continents considered.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GEOL 110</td>
<td>Introductory Geology Laboratory: CR: GEOL 100 or GEOL 101. Provides first-hand experience with mineral crystals, rocks, fossils, with the processes of rock formation, and with geologic maps.</td>
<td>Qtr. Hrs. - 1</td>
</tr>
<tr>
<td>GEOL 111</td>
<td>Physical Geology Laboratory: CR: GEOL 101. Provides additional experience with physical materials and processes of geology and with the use of maps and stereo photographs for earth crust studies.</td>
<td>Qtr. Hrs. - 1</td>
</tr>
<tr>
<td>GEOL 112</td>
<td>Historical Geology Laboratory: CR: GEOL 102. Provides further experience with fossils and geologic evidence and exercises in reconstructing earth history.</td>
<td>Qtr. Hrs. - 1</td>
</tr>
<tr>
<td>GER 101</td>
<td>Elementary German Language and Civilization: Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to German culture.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GER 102</td>
<td>Elementary German Language and Civilization: PR: GER 101 or equivalent. Continuation of GER 101.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GER 103</td>
<td>Elementary German Language and Civilization: PR: GER 102 or equivalent. Continuation of GER 102.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GER 201</td>
<td>Intermediate German Language and Civilization: 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.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GER 202</td>
<td>Intermediate German Language and Civilization: PR: GER 201 or equivalent. Continuation of GER 201.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
<tr>
<td>GER 203</td>
<td>Intermediate German Language and Civilization: PR: GER 202 or equivalent. Continuation of GER 202 with greater emphasis on German civilization from the Middle Ages to the present.</td>
<td>Qtr. Hrs. - 3</td>
</tr>
</tbody>
</table>
GER

GER 301  Qtr. Hrs. - 4  
German Composition: 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  Qtr. Hrs. - 4  
German Conversation: PR: GER 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

GER 321  Qtr. Hrs. - 3  
Short Story: PR: GER 203 or equivalent. German short prose works of the XIXth and XXth centuries.

HISTORY

HIST 201  Qtr. Hrs. - 4  
Western Culture and Civilization I: Rise of culture and civilization in the West from earliest times to the eve of the Renaissance.

HIST 202  Qtr. Hrs. - 4  
Western Culture and Civilization II: Continuation of HIST 201. Europe from its feudal-manorial state through the Napoleonic era.

HIST 203  Qtr. Hrs. - 4  
Western Culture and Civilization III: Continuation of HIST 202. The Romantic era, the influence of liberalism, nationalism, and modern industrialism upon political, social, economic, and intellectual life.

HIST 311  Qtr. Hrs. - 4  
American History I: An introduction to the culturally interrelated problems of American values and institutions; past and present. Historical basis of evolving institutions of the United States is demonstrated in economic life, government education, family life, and religion.

HIST 312  Qtr. Hrs. - 4  
American History II: Continuation of HIST 311. A topical study of America's evolving political institutions in response to population growth, national wealth, and changing needs in an age of science and technology; the urban-suburban revolution, social stratification, the family, and educational and religious institutions and values.

HIST 313  Qtr. Hrs. - 4  
American History III: 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 320  Qtr. Hrs - 4  
The Changing Frontier in American History: A survey of the types and geographic settings of the frontiers. Attention given to the impact of the frontier on American History.

HIST 324  Qtr. Hrs. - 4  
Black American History: The history of the Negro in Africa and in the United States. Emphasis is placed on the effects of an African heritage, slavery, and post-Civil War conditions on Black Americans. In addition, contemporary issues relating to Black Americans are analyzed.

HIST 330  Qtr. Hrs. - 4  

HIST 331  Qtr. Hrs. - 4  
Latin American History: The 19th Century: Continuation of HIST 330.

HIST 332  Qtr. Hrs. - 4  
Latin American History: The 20th Century: Continuation of HIST 331.

HIST 412  Qtr. Hrs. - 4  

HIST 413  Qtr. Hrs. - 4  
United States History: 1789-1824: The writing of the Constitution, the Federalist decade, Jeffersonian Democracy, the War of 1812, and emergence of New Nationalism.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST 414</td>
<td>United States History: 1820-1860: Administration of Andrew Jackson to the Civil War.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 415</td>
<td>United States History: 1860-1876: Civil War, Reconstruction, and impact of industrialism.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 416</td>
<td>United States History: 1876-1918: The Agrarian Revolt, the Spanish-American War, and the Progressive Era.</td>
<td>Qtr. Hrs. - 4</td>
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<tr>
<td>HIST 417</td>
<td>United States History: 1914-1940: The Progressive Reforms of Woodrow Wilson, World War I, post-war prosperity, the Depression, and the New Deal.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 418</td>
<td>United States History: 1941-Present: Contemporary America from World War II.</td>
<td>Qtr. Hrs. - 4</td>
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<tr>
<td>HIST 420</td>
<td>United States Diplomatic History: 1776-1917: The evolution of American foreign policy with stress upon the international background and the constitutional and political problems in planning policy.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 421</td>
<td>United States Diplomatic History: 1917-Present: Continuation of HIST 420.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 430</td>
<td>Latin American History: The ABC Countries: A survey of the histories of Argentina, Brazil, and Chile from the colonial period to the present.</td>
<td>Qtr. Hrs. - 5</td>
</tr>
<tr>
<td>HIST 452</td>
<td>The Middle Ages and The Renaissance: 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.</td>
<td>Qtr. Hrs. - 5</td>
</tr>
<tr>
<td>HIST 461</td>
<td>English History to 1485</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 462</td>
<td>English History: 1485-1815</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 463</td>
<td>British History: 1815-Present</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 464</td>
<td>British Empire and Commonwealth: Development of the British Empire and Commonwealth since the American Revolution.</td>
<td>Qtr. Hrs. - 4</td>
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<tr>
<td>HIST 466</td>
<td>British History: Tudor-Stuart Period: A study of the Tudor-Stuart period, with particular emphasis on the civil/religious conflicts of the time.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 470</td>
<td>History of Russia to 1856</td>
<td>Qtr. Hrs. - 4</td>
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<tr>
<td>HIST 471</td>
<td>History of Russia: 1856-1917</td>
<td>Qtr. Hrs. - 4</td>
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<tr>
<td>HIST 472</td>
<td>History of the Soviet Union: 1917-Present</td>
<td>Qtr. Hrs. - 4</td>
</tr>
<tr>
<td>HIST 480</td>
<td>History and Historians: PR: Permission of instructor. A general study of historiography, tracing the thoughts and works of the great historians. Attention is also given to the trends and interpretations of history in the areas of student specialization.</td>
<td>Qtr. Hrs. - 4</td>
</tr>
</tbody>
</table>
HUMANITIES

HUM 201  Qtr. Hrs. - 4
Western Humanities Survey: A series of lectures on each of the major cultural epochs, designed to give the student a historical perspective and to equip him to select periods for intensive study from the Mind-and-Art Series.

HUM 300  Qtr. Hrs. - 4
The Hebrew and Christian Heritage: The religious, literary, and artistic influences of early Judaism and Christianity on Western Culture; their basis in the social and political context of the Fertile Crescent. (Same as REL 300.)

HUM 301  Qtr. Hrs. - 4
The Mind and Art of Greece: The principal monuments in philosophy, architecture, drama, poetry, and sculpture from the Minoan-Mycenaean to the Hellenistic Age.

HUM 304  Qtr. Hrs. - 4
The Mind and Art of Rome: Contributions to law, literature, architecture, and the ordering of culture, from the Etruscan period to the Age of Constantine.

HUM 305  Qtr. Hrs. - 4
Mind and Art of the Middle Ages: The merging of Classical, Christian, and Germanic influences during the age of faith, from St. Augustine to Dante; their expression in stone, in music, in poetry, in painting, and in philosophy.

HUM 306  Qtr. Hrs. - 4
Mind and Art of the Renaissance: The rebirth of humanistic art and free inquiry, particularly in Italy, from Giotto to Titian, with emphasis on the Neo-Platonic Academy, polyphonic music, and visual realism.

HUM 307  Qtr. Hrs. - 4
Reformation and Early Baroque Era: The growth of humanism and Protestantism in the North, Mannerism and Counter Reformation in the South; the age of Shakespeare, Cervantes, El Greco, and Bernini in the arts.

HUM 308  Qtr. Hrs. - 4
Enlightenment and Late Baroque: Literary and philosophical landmarks in the age of rational confidence and Newtonian astronomy; the music of Bach and Handel; the rise of a bourgeois and Rococo style in art.

HUM 309  Qtr. Hrs. - 4
Revolution and Romanticism: The intellectual and artistic tension between freedom and order, between pastoral and urban, between humanitarian reform and the appeal of the past, from Rousseau to Darwin; the great era of music from Haydn to Wagner.

HUM 310  Qtr. Hrs. - 4
Mind and Art of the Recent Past: The influence of evolution, science, and utilitarian thought on various literary, artistic, and musical styles from the mid-19th Century to World War I.

HUM 311  Qtr. Hrs. - 4
Egypt and the Near East: The life and thought of ancient civilizations as revealed through art and archaeology.

HUM 315  Qtr. Hrs. - 4
China and Japan: A study of the highest achievements in art, literature, and thought; an examination of the philosophical, spiritualistic, and rationalistic foundations of Confucianism, Taoism, Zen, and Shintoism. (Same as REL 315.)

HUM 317  Qtr. Hrs. - 4
India: The cultural traditions and the principal monuments in art and literature; a study of Hindu and Buddhist religious thought as it developed in India and Southeast Asia. (Same as REL 317.)

HUM 318  Qtr. Hrs. - 4
Islamic Cultures: An inquiry into the foundations and development of Islamic thought and culture in various geographical locations. (Same as REL 318.)

HUM 321  Qtr. Hrs. - 4
Art and Thought of Eastern Europe: Literature, philosophy, music, and art from the 19th and 20th centuries, including works by Dostoevsky, Babel, Kazantzakis, Moussorgski, Bartok, Brancusi, Kandinsky, and Chagall.
HUM 335 Qtr. Hrs. - 4
Afro-American Culture: The artistic influence of the Negro in America.

HUM 351 Qtr. Hrs. - 4
Latin-American Cultures: The art and archaeological remains of Inca, Mayan, and Aztec civilizations; their influences on Latin-American music, art and literature.

HUM 355 Qtr. Hrs. - 4
American Ideas I: 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 Qtr. Hrs. - 4
American Ideas II: Continuation of HUM 355 with emphasis on the effect of industrialism, pragmatism, individualism, and the cycles of reform and reaction.

HUM 371 Qtr. Hrs. - 4
Contemporary Culture I: An integrated view of the fine arts and literature of our time; revealing the impact of depersonalization, alienation, revolt, and the search for self-awareness.

HUM 372 Qtr. Hrs. - 4
Contemporary Culture II: The popular arts of our time — jazz, photography, science fiction, television, and film — as they reflect the influences of technology, relativism, protest, and innovation.

HUM 413 Qtr. Hrs. - 4
The Romantic Mood: A comparative study of selected romantic art works in various periods and places, including modern America.

HUM 415 Qtr. Hrs. - 4
Cultural Influences, East and West: A comparative study of Eastern and Western cultures, emphasizing their approaches to human problems. Primary works in art, philosophy, and literature may be considered.

HUM 421 Qtr. Hrs. - 4
Purpose of Art: An introduction to the history and appreciation of the visual arts through an understanding of the various purposes art has fulfilled in man's effort to master and enjoy his environment. For visual arts education majors as well as for humanities majors.

HUM 425 Qtr. Hrs. - 3
Religious Symbolism in the Visual Arts: A study of the origin, migration, and transmutation of religious signs, symbols and images in the history of art. (Same as Art 425.)

HUM 441 Qtr. Hrs. - 4
Purpose of Music: Religious and social functions of music and its relationships with other arts.

HUM 451 Qtr. Hrs. - 4
The Epic: The epic hero as a model of human ideals in various cultural settings.

HUM 455 Qtr. Hrs. - 4
The Tragic View: 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 Qtr. Hrs. - 4
The Comic View: A definition of the comic and satiric views of life and a study of examples in literature from Aristophanes to Ionesco.

HUM 461 Qtr. Hrs. - 4
The Secular View: An examination of the philosophical foundations of secularism and of literary and political humanism, based on the work of Erasmus, Montaigne, Voltaire, Hobbes, Locke and Rousseau.

HUM 471 Qtr. Hrs. - 4

HUM 473 Qtr. Hrs. - 4
Confession Literature: A comparative study of works offering insight into the minds and personal lives of influential thinkers from St. Augustine to the present.
### Humanities and Fine Arts

**HUM 475**

**Wisdom Literature:** An examination of several texts of aphorisms, parables, and tales, ranging from the Book of Proverbs to Kafka, from the later Chan Masters to the French Moralistes, in an attempt to ravel the common thread of human speculation on human affairs.

### Humanities and Fine Arts

**HFA 490**

**Senior Seminar: Humanities and Arts in Human Affairs:** A forum on the art and thought of the contemporary world as they provide insight into the recurring problems of human existence and as they relate to the search for fulfillment, self-awareness, and wholeness. Primarily intended for senior students. Offered as one of the Advanced Environmental Studies seminars. Not open in the College of Humanities and Fine Arts.

### Industrial Engineering and Management Systems

**IEMS 301**

**Management Standards:** PR: ENGR 341, CR: ENGR 371. Management standards for evaluation and control of the performance of men and man-machine systems. Flow sequences, work design principles, measurement and evaluation of work with respect to time and wages. Laboratory assignments.

**IEMS 311**

**Engineering Law:** PR: Junior standing. Influence of contract, property and tort law upon engineering activities; contracts, agency, partnerships, corporations, liens and expert testimony. Inception and development of inventions. Patents and licensing.

**IEMS 324**

**Production Management:** PR: Sophomore Standing. Principles and methods of production viewed from a managerial decision-making level. (Same as MGMT 324).

**IEMS 332**

**Statistical Quality Control:** Statistical concepts and methods applied to the control of quality of manufactured products. (Same as STAT 332.)

**IEMS 411**

**Industrial Administration:** PR: ENGR 443. Role of the engineer in manufacturing management. Basic functions, departmentation, authority relationships, and methods of control.

**IEMS 412**

**Safety Engineering:** PR: Junior standing. Basic principles of accident prevention in relation to the factors involved in the accident prevention. Hazards within the workplace environment - plant layout and materials handling, machinery, electrical hazards, flammable materials and pressure vessels.

**IEMS 414**

**Industrial Facilities Planning Design:** PR: IEMS 301. Comprehensive design of an industrial production system. Problems involved in and the inter-relationships of plant location, product analysis, process design, equipment selection, materials handling, plant arrangement and supplementary services. Laboratory assignments.

**IEMS 415**

**Job Evaluation and Wage Incentives:** PR: IEMS 301 or IEMS 324. Work measurement as a basis for industrial wage systems; consideration of work factor and task analysis in job classification and wage determination.

**IEMS 418**

**Project Engineering:** 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 422**

**Network Analysis:** PR: ENGR 442. Development, application and computerized analysis of networks for systems analysis and control. Applications of CPM, PERT, GERT and maximal flow concepts. Laboratory Assignments.
IEMS 423 Qtr. Hrs. - 3
Analysis of Industrial Operations: PR: Minimum of 12 credits of IEMS course work. An extensive and intensive analysis of industrial operations for optimum utilization of resources. Laboratory Assignments.

IEMS 424 Qtr. Hrs. - 3
Management Control Systems: PR: ENGR 371 or equivalent. Management decision rules, and mathematical and economic models of production, forecasting, scheduling, order control and inventory control. Application of the computer as a management tool to automate control of the production and inventory process.

IEMS 431 Qtr. Hrs. - 3
Engineering Applications of Computer Methods: 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. Two hours lecture, two hours laboratory.

IEMS 432 Qtr. Hrs. - 3
System Simulation with Digital Computers: PR: COMP 102 or equivalent. Methods and procedures for simulating large scale systems with digital computers, FORTRAN, CSMP and GPSS programming languages are used. Laboratory assignments.

IEMS 433 Qtr. Hrs. - 3
Information Acquisition: PR: ENGR 371. The design of systems to collect data for use in managerial decision models, job evaluation, wage payment, production standards, queuing studies, engineering evaluation, and reliability predictions.

IEMS 441 Qtr. Hrs. - 4

IEMS 443 Qtr. Hrs. - 3

IEMS 447 Qtr. Hrs. - 3

IEMS 450 Qtr. Hrs. - 3
Biomedical Engineering: PR: ENGR 342 or C.L. An introduction to the engineering description and analysis of living systems. Application of modern technology to medicine and biology. Systems analysis and its application to biomedical and ecological systems.

IEMS 461 Qtr. Hrs. - 3
Human Engineering: PR: Senior standing. Man-machine systems; design and conduct of human engineering studies. Laboratory assignments.

IEMS 462 Qtr. Hrs. - 3
Human Factors in Space Travel: PR: IEMS 461. Artificial environments and environmental control of upper atmosphere and space.

IEMS 464 Qtr. Hrs. - 3
Design of Industrial Operations: PR: IEMS 331. Planning, analyzing, controlling and evaluating production systems. Laboratory assignments.

IEMS 470 Qtr. Hrs. - 3
Introduction to Public Systems Analysis: PR: ENGR 371 or equivalent. Application of probability and statistics to the analysis of public systems data. Operations research models and applications; economic decision-models; cost/benefit analysis.

IEMS 502 Qtr. Hrs. - 3
Probability for Engineers: PR: ENGR 371. Engineering application of probability, combinatorial analysis, sample space, events, probability, discrete and continuous random variables, and probability distributions. (Same as STAT 535).

IEMS 503 Qtr. Hrs. - 3
Statistics for Engineers: PR: ENGR 371. Engineering application of statistics, significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation. (Same as STAT 536).
IEMS 510  Qtr. Hrs. - 4
Hospital Systems Analysis:  PR: IEMS 301 or equivalent.
The application of industrial engineering and systems analysis concepts and techniques to hospital management and operational systems. Hospital systems organization, effectiveness measures and improvement methods.

IEMS 524  Qtr. Hrs. - 3
Operations Research I:  PR: ENGR 442 or equivalent.
The methods of operations research including formulation of models and derivation of solutions by various optimization techniques; introduction to deterministic models and techniques, sequencing and replacement, linear programming, geometric and dynamic programming.

IEMS 525  Qtr. Hrs. - 4
Operations Research II:  PR: IEMS 524. Introduction to stochastic models and techniques including queueing theory. Simulation, non-linear programming, calculus of variations, and forecasting.

IEMS 532  Qtr. Hrs. - 4
Management Information Systems I:  PR: COMP 102 or equivalent. Computer-based management information systems. Analysis of the management and control functions from the context of information processing requirements. Presentation of alternative system designs, including real-time, on-line computing systems.

IEMS 540  Qtr. Hrs. - 4
Systems Dynamics:  PR: COMP 102 or equivalent. Industrial dynamics and the information feedback characteristics of industrial systems. Construction, verification, and use of computer-based simulation models for the design, analysis, and improvement of organizational structures and management control policies. Introduction to the use of DYNAMO II computer simulation language.

IEMS 541  Qtr. Hrs. - 4
Mathematical Systems Theory II:  PR: IEMS 441 or equivalent. Introduction to non-linear analysis. Approximation methods and numerical solutions. Stability of non-linear systems. Systems examples to be taken from engineering, environmental science, and economics.

IEMS 550  Qtr. Hrs. - 4
Biomedical Instrumentation:  PR: ENGR 342 or consent of instructor. Theory and techniques of biological instrumentation systems including transducers and computers applications. The nature of biological signals, their detection, analysis and display.

IEMS 602  Qtr. Hrs. - 3

IEMS 610  Qtr. Hrs. - 3
Project Engineering:  PR: Graduate 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 620  Qtr. Hrs. - 3

IEMS 626  Qtr. Hrs. - 4
Linear Programming:  PR: ENGR 442 or equivalent. Theoretical and computational aspects of linear programming and related topics including simplex algorithms, duality theory, integer programming and stochastic linear programming. Applications to operational problems and computer solutions are emphasized.

IEMS 627  Qtr. Hrs. - 4

IEMS 628  Qtr. Hrs. - 4
Dynamic Programming:  PR: IEMS 524. A study of the optimization of multistage decision processes based on the application of the principle of optimality. Stochastic and deterministic models are developed.
IEMS 641  Qtr. Hrs. - 4  

IEMS 671  Qtr. Hrs. - 3  
Public Works Economics: PR: ENGR 341 or equivalent. Economic considerations in public works planning. The nature and objective functions of public works projects; cost estimating, cost allocation and pricing. Cost/benefit analysis on primary and secondary benefits from public works projects.

IEMS 672  Qtr. Hrs. - 4  
Urban Dynamics: PR: IEMS 540. Development of dynamic and community systems models. Use of computer simulation to analyze governmental and private sector policies in selected areas such as housing programs, industrial growth, worker training programs, environmental quality control, urban planning and land use planning.

IEMS 678  Qtr. Hrs. - 3  
Public Operating Systems Analysis: PR: ENGR 371 or equivalent. Establishment of data base for public operating systems, including identification of data requirements. Development of service demand and workload relationships, resource and manpower requirements.

IEMS 679  Qtr. Hrs. - 3  
Public System Planning and Resource Allocation: PR: IEMS 678. Forecasting work load, demand rates, public services by correlation with census factors in geographical grid network. Application of basic operations research techniques, computer simulation models and analytical operating models to optimize resource allocation and work assignment planning.

INHALATION THERAPY

IT 301  Qtr. Hrs. - 1  

IT 302  Qtr. Hrs. - 1  

IT 330  Qtr. Hrs. - 3  

IT 331  Qtr. Hrs. - 1  
Cardiopulmonary Resuscitation Laboratory: Adult intubation and available airways. Defibrillation practice. Taken concurrently with IT 330.

IT 340  Qtr. Hrs. - 3  

IT 350  Qtr. Hrs. - 3  

IT 351  Qtr. Hrs. - 1  
Respiratory Equipment Laboratory: Procedures in cleaning, sterilizing, maintenance, and repair of equipment. Taken concurrently with IT 350.

IT 352  Qtr. Hrs. - 3  

IT 353  Qtr. Hrs. - 1  
Respiratory Equipment Function Laboratory: Care and sterilization of respirators. Calibration of blood gas analyzers. Care and standardization of bedside volumetric equipment. Taken concurrently with IT 352.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Qtr. Hrs.</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT 371</td>
<td>Qtr. Hrs. - 1</td>
<td>Pulmonary Physiology Laboratory</td>
<td></td>
<td>Experiments in ventilation mechanics, diffusion, circulation, and gas transport. Taken concurrently with IT 370.</td>
</tr>
<tr>
<td>IT 380</td>
<td>Qtr. Hrs. - 3</td>
<td>Respiratory Pathology</td>
<td>ZOOL 224</td>
<td>Cellular pathology with emphasis on pathology of respiratory and cardiovascular systems.</td>
</tr>
<tr>
<td>IT 381</td>
<td>Qtr. Hrs. - 1</td>
<td>Respiratory Pathology Laboratory</td>
<td></td>
<td>Macro and microscopic identification of respiratory diseases. Gross pathology. Taken concurrently with IT 380.</td>
</tr>
<tr>
<td>IT 401</td>
<td>Qtr. Hrs. - 1</td>
<td>Clinical Practice III</td>
<td>C.I.</td>
<td>Advanced cardiopulmonary resuscitation. Patient care with advanced cardiopulmonary equipment.</td>
</tr>
<tr>
<td>IT 402</td>
<td>Qtr. Hrs. - 1</td>
<td>Clinical Practice IV</td>
<td>C.I.</td>
<td>Pulmonary functions studies. Care of patients with medically treated diseases. Exposure to the functional role of the department administrator.</td>
</tr>
<tr>
<td>IT 403</td>
<td>Qtr. Hrs. - 1</td>
<td>Clinical Practice V</td>
<td>C.I.</td>
<td>Pediatrics. Pulmonary rehabilitation. Therapeutic applications of cardiopulmonary medications. Advanced pulmonary function testing on control and patient groups. Application of diagnostic techniques in cardiopulmonary diseases and surgical techniques in open heart, thoracic and general surgery.</td>
</tr>
<tr>
<td>IT 421</td>
<td>Qtr. Hrs. - 1</td>
<td>Respiratory Pediatrics Laboratory</td>
<td></td>
<td>Review of pediatric equipment. Treatment of specific diseases. Infant resuscitative procedures and intubation. Taken concurrently with IT 420.</td>
</tr>
<tr>
<td>IT 430</td>
<td>Qtr. Hrs. - 3</td>
<td>Cardiopulmonary Therapy</td>
<td>IT 370</td>
<td>Introduction of diagnostic and surgical techniques in thoracic and general surgery.</td>
</tr>
<tr>
<td>IT 431</td>
<td>Qtr. Hrs. - 1</td>
<td>Cardiopulmonary Therapy Laboratory</td>
<td></td>
<td>Student participation in cardiac catheterizations and cardiopulmonary bypass techniques. Assignment to the operating room area as observers during thoracic and general surgery. Taken concurrently with IT 430.</td>
</tr>
<tr>
<td>IT 460</td>
<td>Qtr. Hrs. - 3</td>
<td>Medicine</td>
<td>IT 370</td>
<td>Disease states treated medically in conjunction with one or more modalities of respiratory therapy.</td>
</tr>
<tr>
<td>IT 461</td>
<td>Qtr. Hrs. - 1</td>
<td>Equipment Selection and Use in Specific Diseases</td>
<td></td>
<td>The selection of proper equipment and use with common medically treated diseases. Taken concurrently with IT 460.</td>
</tr>
<tr>
<td>IT 462</td>
<td>Qtr. Hrs. - 3</td>
<td>Pulmonary Function Studies</td>
<td>C.I.</td>
<td>Detailed procedures and tests to provide objective information for diagnosis of respiratory diseases.</td>
</tr>
</tbody>
</table>
IT 463  Qtr. Hrs. - 1
Pulmonary Function Laboratory: Testing procedures and experiments in normal and abnormal respiratory functions. Taken concurrently with IT 462.

ITALIAN

ITA 101  Qtr. Hrs. - 3
Elementary Italian Language and Civilization: Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to Italian culture.

ITA 102  Qtr. Hrs. - 3
Elementary Italian Language and Civilization: PR: ITA 101 or equivalent. Continuation of ITA 101.

ITA 103  Qtr. Hrs. - 3
Elementary Italian Language and Civilization: PR: ITA 102 or equivalent. Continuation of ITA 102.

JOURNALISM

JRN 320  Qtr. Hrs. - 3
Press Photography: Learning the use of the still camera, darkroom procedures, role of the photographer.

JRN 321  Qtr. Hrs. - 4
Copy Editing: PR: COM 319. Fundamentals of copy editing for printed media, including selection, processing and display of news.

JRN 322  Qtr. Hrs. - 4
Information Processing: PR: JRN 321 or equivalent. Planning content and format of newspaper and other periodicals; layout; dummying, departmental editing, copy desk management.

JRN 330  Qtr. Hrs. - 4
History of American Journalism: Development of newspapers and magazines, the press associations and the growth of the electronic media.

JRN 331  Qtr. Hrs. - 3
Film Criticism: PR: C.I. The practice of writing movie reviews: students will review at least one film a week during the course.

JRN 420  Qtr. Hrs. - 4
Technical and Scientific Writing: PR: C.I. The practice in the gathering of materials for technical and scientific articles; digesting of technical information into more readable forms.

JRN 421  Qtr. Hrs. - 4
Editorial and Column Writing: PR: C.I. Building the editorial page, backgrounding and interpreting the news.

JRN 422  Qtr. Hrs. - 4

JRN 423  Qtr. Hrs. - 4
Writing for the Mass Media: PR: C.I. Students write for a certain segment of the mass media of their own choosing. Will include creative writing, article writing, etc. May be repeated for credit.

JRN 424  Qtr. Hrs. - 4
Critical Writing: PR: C.I. Practice in writing reviews of plays, concerts, and books.

JRN 425  Qtr. Hrs. - 4
Feature Writing: PR: C.I. Writing of feature articles for newspapers and magazines.

JRN 431  Qtr. Hrs. - 4
International Communication and the Foreign Press: A study of the news communicating systems of the world, the role of foreign correspondents, the foreign press.

JRN 433  Qtr. Hrs. - 4
Propaganda and Psychological Warfare: Propaganda and psychological warfare principles with a study of the activities engaged in by nations.
JRN 436  Qtr. Hrs. - 4
Advertising Copy: PR: COM 434. The writing and preparation of advertising copy.

JRN 437  Qtr. Hrs. - 4
Advertising Campaigns: PR: JRN 436 or C.I. The planning and execution of an advertising campaign; use of research and coordination of elements of the campaign.

LAW ENFORCEMENT

LENF 201  Qtr. Hrs. - 5
Law Enforcement: A comprehensive survey of the history and philosophy of law enforcement. The role of the police as a functional component in the broad system of criminal justice will be emphasized.

LENF 202  Qtr. Hrs. - 4
Administration of Justice: A study of the broad system of criminal justice in America, with an emphasis on the federal, state, and local courts, and parole and probation agencies.

LENF 205  Qtr. Hrs. - 4
Police Science and Technology: PR: LENF 201. Study of operational concepts of investigative and scientific professions as affecting discovery, preservation, and examination of physical tracings from negligent or criminal events. The specific advantages and limitations of scientific interpretations.

LENF 207  Qtr. Hrs. - 4
Criminal Investigation: A comprehensive survey of the modern methods and procedures used in the investigation and solution of criminal offenses.

LENF 300  Qtr. Hrs. - 4
Crime in America: Social factors and processes in criminal and delinquent behavior. Perspectives on criminal behavior and its varied patterns. Socialized criminals, the sociopathic offender, organized crime, white-collar crime, drug use and abuse, the sexual offender, and protest, politics and crime.

LENF 301  Qtr. Hrs. - 4
Criminal Law in Action: PR: C.I. Basic concepts of the criminal law, their origin and development in Anglo-American jurisdiction; constitutional and procedural restraints on law enforcement, their purpose and implementation; modern criminal procedures; Federal and State relationships in the administration of justice.

LENF 303  Qtr. Hrs. - 5
Municipal Police Administration: PR: LENF 201. Advanced study of contemporary operational concepts of administration with an emphasis on function, rather than structure. An examination of emerging ideas such as lateral entry, team policing, central staff control, and professionalization.

LENF 304  Qtr. Hrs. - 5
The Police Manager: PR: LENF 201. Elements of first-line supervision and executive development. Administrative leadership; its situational nature; methods and traits; recent theories and research on leadership.

LENF 310  Qtr. Hrs. - 4
The Correctional and Penal Systems: Organization and function of institutions and noninstitutional services in the correctional rehabilitation of criminal and juvenile offenders, contemporary philosophies and methods in the treatment of adult criminals and juvenile delinquents.

LENF 400  Qtr. Hrs. - 4
Police and the Community: Police relationships with the citizenry. Ethnic tension and conflict in relation to law enforcement. The police role in dealing with groups, crowds, gangs and nonconformist cultures.

LENF 401  Qtr. Hrs. - 5
Selected Problems in Law Enforcement: PR: Upper division standing and C.I. Classroom analysis of contemporary and emerging problems in law enforcement.

LENF 407  Qtr. Hrs. - 4
Comparative Police Systems: A survey of the history and philosophy of foreign systems of law enforcement with special emphasis on the English, French, and German police.
LENF 410  Qtr. Hrs. - 4
Financial Administration and Budgeting:  PR: LENF 303 or 304. Police budgets as instruments of policy making and management. Financial, fiscal, administrative and legal aspects of budgeting.

MANAGEMENT

MGMT 301  Qtr. Hrs. - 5
Management:  Fundamentals of management underlying the solution of problems relating to the organization and operation of business enterprises.

MGMT 324  Qtr. Hrs. - 3
Production Management:  PR: MGMT 301. Principles and methods of production viewed from a managerial decision-making level. Same as IEMS 324.

MGMT 364  Qtr. Hrs. - 5
Personnel Management:  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 401  Qtr. Hrs. - 4
Organization Theory:  PR: MGMT 301. Elements in organizations and the processes by which they develop and influence behavior are considered.

MGMT 424  Qtr. Hrs. - 4
Production Management Problems:  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 465  Qtr. Hrs. - 4
Industrial Relations:  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 466  Qtr. Hrs. - 4
Human Relations in Management:  PR: MGMT 301. The individual, interpersonal and group relations and intergroup and organizational problems in business.

MGMT 601  Qtr. Hrs. - 3
Management Process:  PR: Graduate standing. The organization as a "natural system," its functional components and the processes whereby these components interact to accomplish organizational goals.

MGMT 611  Qtr. Hrs. - 3
Organizational Behavior:  PR: Graduate standing. The relationship of human behavior to organization performance, including motivation, leadership, organizational environment, social environment and communication.

MGMT 621  Qtr. Hrs. - 3
Group Decisions and Analysis:  PR: Graduate standing. Experience in company-wide management decision-making by groups using the management game technique. Analysis of the group decision-making process using video tapes.

MARKETING

MKTG 301  Qtr. Hrs. - 5
Marketing:  Study of functions, institutions and basic problems in marketing of goods and services in our economy.

MKTG 326  Qtr. Hrs. - 4
Consumer Market Behavior:  PR: MKTG 301. An analysis of consumer motivation, buying behavior, market adjustment and product innovation. Behavioral aspects of the marketing process from producer to ultimate user or consumer are considered.
MKTG 334  Qtr. Hrs. - 4
Marketing Models and Logistics: PR: MKTG 301, ECON 321. Qualitative and quantitative model building concepts applied to marketing problems with special emphasis on product planning, distribution, promotion strategy, and pricing problems.

MKTG 364  Qtr. Hrs. - 4
Advertising Management: PR: MKTG 301. Analysis of field of advertising; purposes, techniques, media, organization, and role of research; economic and social aspects of advertising.

MKTG 367  Qtr. Hrs. - 4
Sales Management: PR: MKTG 301. Problems confronting sales manager; training in sales techniques; sales objectives and policies; organization; and administration of sales force.

MKTG 384  Qtr. Hrs. - 5
Marketing Research: 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  Qtr. Hrs. - 4
Channels of Distribution Management: PR: MKTG 301. Study of marketing activities and relationship within channels of distribution. Major attention given to decision making and formulation of policies appropriate for wholesalers, retailers, and vertically integrated marketing institutions.

MKTG 485  Qtr. Hrs. - 4
Marketing Policies and Strategies: PR: MKTG 384 and C.I. Marketing problems and policies are explored with emphasis placed on the decision-making process.

MKTG 489  Qtr. Hrs. - 4
Current Marketing Problems: PR: Senior standing, marketing major, and C.I. A course emphasizing the recognition and analysis of marketing problems arising from broad cultural, social, political, legal, economic, and competitive developments.

MKTG 601  Qtr. Hrs. - 3
Marketing Policy: PR: Graduate standing. Marketing policy formulation and decision-making with respect to planning, pricing, promoting, and distributing.

MKTG 602  Qtr. Hrs. - 3
Current Marketing Problems: PR: MKTG 301 or equivalent and graduate standing. Analysis of marketing problems stemming from broad social, economic, and political developments. Topics treated cover broad classes of marketing institutions.

MKTG 604  Qtr. Hrs. - 3
Sales Management and Control: PR: Graduate standing and MKTG 301. A study of the principles and concepts of sales planning and control. Emphasis is placed on the organization of sales departments, the allocation and development of sales territories, and the training, motivation, and supervision of a sales force.

MATHEMATICS

MATH 100  Qtr. Hrs. - 4
Principles of Mathematics: PR: Two years of high school mathematics. Selected topics in mathematics with primary emphasis on developing conceptual understanding and broadening insight into mathematics. Not intended for students in the Colleges of Business Administration, Engineering, or Natural Sciences.

MATH 101  Qtr. Hrs. - 4
Elementary School Mathematics I: PR: Two years of high school mathematics. Logic, sets, the system of whole numbers, numeration systems, the system of integers, the system of rational numbers. Open only to majors in elementary education.

MATH 104  Qtr. Hrs. - 4
Fundamental Algebra: Elementary algebra including factoring, plane coordinates, systems of linear equations, exponents and radicals, quadratic equations and inequalities, ratio, proportion, and logarithms. For those students whose preparation in mathematics is noncurrent or insufficient for MATH 110, 111.
MATH 110  Qtr. Hrs. - 4
Precalculus Mathematics I: PR: MATH 104, or two years of high school algebra and one year of high school plane geometry. This course is intended to cover most of the topics usually found in college algebra emphasizing the notion of function.

MATH 111  Qtr. Hrs - 4
Precalculus Mathematics II: PR: MATH 110 or equivalent (e.g., a course in college algebra which required the mastery of the function concept). Exponential and logarithmic functions; circular and trigonometric functions; inverses of circular functions; complex numbers.

MATH 115  Qtr. Hrs. - 4
Finite Mathematics: 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 201  Qtr. Hrs. - 4
Elementary School Mathematics II: PR: MATH 101. The system of real numbers, polynomials, linear equations and inequalities, systems of equations and inequalities, quadratic equations and inequalities, the complex numbers. Open only to majors in elementary education.

MATH 211  Qtr. Hrs. - 3
Analytic Geometry: CR: MATH 111 or equivalent. Plane and three-dimensional analytic geometry developed with the aid of vectors. Topics include coordinate systems; vectors; lines in the plane; lines and planes in space; conic sections; polar coordinates; transformation of coordinates.

MATH 221, 222, 223  Qtr. Hrs. - 4, 4, 4
Calculus: PR: MATH 110 and MATH 111, or equivalent. CR: MATH 211. The differential and integral calculus of elementary functions of one variable with attention to a variety of geometric and physical applications.

MATH 271  Qtr. Hrs. - 3
Logic and Proof in Mathematics: PR: Four years of high school mathematics or equivalent. The course begins with basic mathematical logic and works up to methods of proof in mathematics using simple mathematical theorems as examples. Primarily for mathematics majors.

MATH 272  Qtr. Hrs. - 3

MATH 301  Qtr. Hrs. - 4
Elementary School Mathematics III: PR: MATH 201 or C.I. Algebraic structures, selected topics from number theory, experimental and formal geometry, points, lines, planes, angles, curves, regions, parallel and intersecting lines and planes, area, congruence, measurement, and space figures. Open only to majors in elementary education.

MATH 314  Qtr. Hrs. - 4
Boolean Algebra: PR: MATH 223 or C.I. Axiomatic development of Boolean algebra; the algebras of sets, logic and circuits as Boolean algebras.

MATH 315, 316  Qtr. Hrs. - 3, 3
Introduction to Number Theory: PR: C.I. Divisibility; primes and composites; divisors; multiples; Euclid's algorithm; Diophantine equations; modulo arithmetic; simple continued fractions. Intended for prospective teachers of mathematics.

MATH 317  Qtr. Hrs. - 3
Matrices: 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  Qtr. Hrs. - 3, 3
Linear Algebra: PR: MATH 223. A detailed analysis of finite dimensional linear spaces including bases, subspaces, dual spaces, quadratic forms, and applications to geometry.
MATH 321 Qtr. Hrs. - 4
Intermediate Calculus: PR: MATH 223. Differential and integral calculus of functions of several variables with applications. Topics include vector differential calculus; partial derivatives; multiple integrals; line and surface integrals.

MATH 331 Qtr. Hrs. - 4
Differential Equations: 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 Qtr. Hrs. - 3
Vector Analysis: 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 Qtr. Hrs. - 4
Foundations of Geometry: PR: C.I. Modern Euclidean geometry; logical defects in Euclid's geometry; simple axiomatic systems; introduction to finite and affine geometries. This course is intended for prospective teachers of mathematics.

MATH 411, 412, 413 Qtr. Hrs. - 3, 3, 3
Algebraic Structures: PR: MATH 223. An introduction to the properties of groups, rings, polynomial rings, integral domains and fields.

MATH 414 Qtr. Hrs. - 3
Semi-Groups and Groups: PR: C.I. An axiomatic development of basic properties of semi-groups and groups.

MATH 420 Qtr. Hrs. - 3

MATH 421, 422, 423 Qtr. Hrs. - 3, 3, 3
Advanced Calculus: 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 Qtr. Hrs. - 3
Lebesgue Theory: PR: MATH 423. Inner and outer measure; measurable sets and functions; the Lebesgue integral.

MATH 425 Qtr. Hrs. - 3
Techniques of Complex Variables: 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 Qtr. Hrs. - 3, 3
Theory of Complex Variables: PR: MATH 321. 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 Qtr. Hrs. - 3
The Number System: PR: C.I. 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 Qtr. Hrs. - 3
Foundations of Calculus: PR: C.I. 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 Qtr. Hrs. - 3
Ordinary Differential Equations: PR: MATH 331. Systems of equations; the Wronskian; Abel's identity; integrating factors and adjoint equations.
MATH 432 Qtr. Hrs. - 3

MATH 434 Qtr. Hrs. - 3
Partial Differential Equations: 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 Qtr. Hrs. - 3
Boundary Value Problems: PR: MATH 434. Adjoint forms and Green's functions; applications in engineering and the physical sciences.

MATH 436 Qtr. Hrs. - 3
Special Functions: 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 Qtr. Hrs. - 3
Laplace Transforms: PR: MATH 331. The Laplace and Z transforms; solutions of ordinary and partial differential equations; application to circuit analysis and difference equations.

MATH 438 Qtr. Hrs. - 3
Transform Calculus: PR: MATH 331. Fourier, Hankel and other transforms with applications to physical problems; the transformations of distributions.

MATH 451, 452 Qtr. Hrs. - 3, 3
Non-Euclidean and Projective Geometry: PR: MATH 351 or C.I. Non-Euclidean geometry; projective plane, perspectivities, projectivities; projective theory of conics; analytic projective geometry; vector theory; and linear theory; and linear transformations in projective geometry.

MATH 461 Qtr. Hrs. - 3
Basic Topology: PR: MATH 421 or MATH 420. Compactness; connectedness; general metric spaces; topological spaces; limit points.

MATH 462 Qtr. Hrs. - 3

MATH 490 Qtr. Hrs. - 3

MECHANICAL ENGINEERING AND AEROSPACE SCIENCES

MEAS 341 Qtr. Hrs. - 3

MEAS 342 Qtr. Hrs. - 3

MEAS 351 Qtr. Hrs. - 3
Measurement Systems: 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 Qtr. Hrs. - 4
Fluid Mechanics: PR: ENGR 332. Continuation of ENGR 332. Topics in gas dynamics, including shock waves, viscous flow analysis and solutions in boundary layer theory. Lecture, demonstration, and laboratory.
MEAS 382  Qtr. Hrs. - 3
Thermodynamics of Mechanical Systems: PR: ENGR 431. Applied thermodynamics, availability analysis, thermodynamics of reactive and non-reactive mixtures, thermodynamic relations of properties. Thermodynamic design analysis of complete mechanical systems.

MEAS 411  Qtr. Hrs. - 3
Aerodynamics: 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. Lecture, demonstration, and laboratory.

MEAS 413  Qtr. Hrs. - 3
Stability and Control: PR: MEAS 411. Application of elementary aerodynamic principles to static and dynamic stability and control surface theory.

MEAS 415  Qtr. Hrs. - 4

MEAS 423  Qtr. Hrs. - 4

MEAS 424  Qtr. Hrs. - 3
Flight Vehicle Structures: PR: ENGR 312. Space structures; thin-walled structures; load factors; non-symmetrical bending and transverse shear; shear center and shear flow; semimonocoque construction, fuselage rings; multicelled structures; sandwich panels, fatigue.

MEAS 432  Qtr. Hrs. - 3

MEAS 436  Qtr. Hrs. - 3
Mechanical Power Systems: PR: MEAS 382. 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 441  Qtr. Hrs. - 3
Engineering Design and Analysis: PR: MEAS 342, Senior standing. Problem formulations and definition, inventiveness enhancement, generalized physical principles, numerical and computer methods and optimization techniques. Three lectures.

MEAS 451  Qtr. Hrs. - 3

MEAS 482  Qtr. Hrs. - 4

MEAS 523  Qtr. Hrs. - 3
Acoustics: PR: Approval of instructor. Elements of vibration theory and wave motion; radiation, reflection, absorption, and transmission of acoustic waves; architectural acoustics; control and abatement of environmental noise pollution.

MEAS 537  Qtr. Hrs. - 3
Energy Conversion: PR: MEAS 382 and PHYS 344. Unconventional methods of energy conversion; particular emphasis on fuel cells, thermoelectrics, thermionics, solar energy, photovoltaics, nuclear, and magnetohydrodynamics.
MEAS 538  Qtr. Hrs. - 3
Environmental Thermodynamics: PR: ENGR 431 or equivalent. Thermodynamics of the environment, computation of energy requirements; physiological reactions to the environment, air and gas distributions, control systems and cleaning of air and the atmosphere.

MEAS 542  Qtr. Hrs. - 3
Principles of Design: PR: MEAS 342. Design procedures; force and motion analysis; failure modes; stress and deflection analysis; stress concentration; fatigue; selected components.

MEAS 581  Qtr. Hrs. - 3

MEAS 611  Qtr. Hrs. - 3
Aerodynamics: PR: MEAS 411 or equivalent. Theoretical methods useful for predicting performance and stability of thin lifting surfaces and slender vehicles at subsonic, supersonic and hypersonic speeds.

MEAS 613  Qtr. Hrs. - 3

MEAS 641  Qtr. Hrs. - 3
System Control: PR: ENGR 421 or equivalent. Theoretical, experimental and computer methods involved in the design of control systems. Emphasis on non-linear systems and advanced methods for control system analysis and optimization.

MEAS 643  Qtr. Hrs. - 3

MEAS 653  Qtr. Hrs. - 3
Experimental Measurements: PR: Approval of instructor. Principles of operation, analysis and design of measurement systems for engineering applications with emphasis upon the measurement of environmental parameters.

MEAS 671  Qtr. Hrs. - 3

MEAS 673  Qtr. Hrs. - 3
Transport Processes: PR: ENGR 431 or equivalent. Principles of the transport of mass, momentum and energy in fluids with applications to atmospheric and other environmental processes as well as equipment design.

MEAS 674  Qtr. Hrs. - 3

MEAS 686  Qtr. Hrs. - 3

MEDICAL RECORD ADMINISTRATION

MRA 300  Qtr. Hrs. - 3
Medical Record Science I: Two hour lecture, two hour laboratory. An introduction to the field of Medical Record Administration with emphasis on evaluation and application of identification, storage and retrieval systems, preservation and retention of records.

MRA 301  Qtr. Hrs. - 5
Medical Record Science II: PR: MRA 300 and MRA 305; or C.I. Three hour lecture, four hour laboratory. A study in depth of the medical record, its components, development and use, including health statistics and legal concepts in Medical Record Administration.
MRA 302  Qtr. Hrs. - 5
Medical Record Science III: PR: MRA 301 or C.I. Three hour lecture, four hour laboratory. Principles of coding and indexing procedures, special registries, research and statistical techniques.

MRA 305  Qtr. Hrs. - 5
Medical Terminology: A study of the language of medicine and allied health specialties, including word construction, definitions and application of terms.

MRA 370, 371  Qtr. Hrs. - 1, 1
Directed Experience: PR: MRA 300. Four hours per week in a selected health care facility. Application of the principles discussed in MRA 300, 301, and 302.

MRA 403  Qtr. Hrs. - 5
Medical Record Science IV: PR: MRA 301 or C.I. Three hour lecture, four hour laboratory. Principles of related health information systems of hospitals, nursing homes, extended health care facilities, psychiatric and other specialized institutions. Methods of establishing a medical reference library.

MRA 404  Qtr. Hrs. - 3
Medical Record Seminar: CR: MRA 421 or C.I. Discussion and problem-solving by use of case-method approach for the purpose of coordinating the students’ knowledge, skills and experience in medical record practice.

MRA 420, 421  Qtr. Hrs. 3, 3
Medical Record Organization and Administration: PR: MRA 403 or C.I. Two hour lecture, two hour laboratory. A study of the principles of control and management of departmental functions.

MRA 472  Qtr. Hrs. - 2
Directed Experience: PR: MRA 371. Eight hours per week in a selected health care facility. A supervised experience enabling the students to handle problems of medical record personnel. Provides the students with administrative experience in the usual activities and responsibilities of the department.

MICR 200  Qtr. Hrs. - 4
General Microbiology: PR: 8 hours of biological science. Fundamentals of microbiology, microbial morphology, metabolism and laboratory techniques.

MICR 210  Qtr. Hrs. - 2
Culture Media and Reagents: PR: MICR 200. Preparation of differential, selective and enrichment media; reagents used in microbiology.

MICR 300  Qtr. Hrs. - 4
Advanced General Microbiology: PR: MICR 200; CR: CHEM 121 or CHEM 113. Advanced fundamental theory and technique.

MICR 320  Qtr. Hrs. - 4
Pathogenic Microbiology: PR: MICR 300 or C.I. Microorganisms producing disease in man and other animals; means of transmission; protection against disease.

MICR 322  Qtr. Hrs. - 4
Microbiology of Water and Waste: PR: MICR 300. Organisms in water and their relationship to production and distribution of potable water; disposal of sewage.

MICR 350  Qtr. Hrs. - 4
Microbial Ecology: PR: BIOL 350 and MICR 300. Study of the roles of microbes in the environment.
**MICR**

**MICR 410**  
Qtr. Hrs. - 5  
Diagnostic Microbiology: PR: MICR 320. Techniques used in identifying bacteria which are pathogenic to man.

**MICR 430**  
Qtr. Hrs. - 4  
Microbial Physiology: PR: MICR 300 and CHEM 442, 444. Relationship between structure and function in microorganisms.

**MICR 440**  
Qtr. Hrs. - 4  

**MICR 470**  
Qtr. Hrs. - 4  
Virology: PR: MICR 300 and CHEM 442. Nature of viruses and Rickettsiae, including their structure, propagation, isolation and identification.

**MICR 520**  
Qtr. Hrs. - 3  
Sanitation and Public Health Microbiology: PR: Graduate standing or C.I. Principles of sanitation and public health. Includes theories of diseases, sanitary procedures on water purification, sewage disposal, refuse collection, food processing, swimming pools and air and water contamination.

**MUSIC**

Courses are clarified as follows:


**MUS 101, 102, 103**  
Qtr. Hrs. - 3, 3, 3  
Music Theory: PR: Music major or C.I. 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**  
Qtr. Hrs. - 2, 2, 2  
Music Literature: PR: Music major or C.I. 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**  
Qtr. Hrs. - 2  
Class Piano: May be repeated for credit.

**MUS 112**  
Qtr. Hrs. - 1  
Voice: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.

**MUS 113**  
Qtr. Hrs. - 1  
String: PR: C.I. by audition. One-half hour private instruction per week. May be repeated for credit.

**MUS 114**  
Qtr. Hrs. - 1  
Woodwind: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.

**MUS 115**  
Qtr. Hrs. - 1  
Brass: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.

**MUS 116**  
Qtr. Hrs. - 1  
Percussion: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.

**MUS 117**  
Qtr. Hrs. - 1  
Organ: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.

**MUS 118**  
Qtr. Hrs. - 1  
Piano: PR: C.I. by audition. One half-hour private instruction per week. May be repeated for credit.
MUS 201, 202, 203  Qtr. Hrs. - 3, 3, 3
Music Theory: PR: MUS 103 or equivalent. Continuation of course content of MUS 101 through 103 integrated with intensive training in aural comprehension.

MUS 204  Qtr. Hrs. - 1
Voice Class: Fundamental principles of the three areas of activity in singing, breathing, phonetic, and resonation.

MUS 205  Qtr. Hrs. - 1
String Class: PR: C.I. by audition. Fundamental principles of string instrument technique. May be repeated for credit.

MUS 206  Qtr. Hrs. - 1
Woodwind Class: PR: C.I. by audition. Fundamental principles of woodwind instrument technique. May be repeated for credit.

MUS 207  Qtr. Hrs. - 1
Brass Class: PR: C.I. by audition. Fundamental principles of brass instrument technique. May be repeated for credit.

MUS 211  Qtr. Hrs. - 2
Piano: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 212  Qtr. Hrs. - 2
Voice: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 213  Qtr. Hrs. - 2
String: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 214  Qtr. Hrs. - 2
Woodwind: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 215  Qtr. Hrs. - 2
Brass: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 216  Qtr. Hrs. - 2
Percussion: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 217  Qtr. Hrs. - 2
Organ: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 218, 219, 220  Qtr. Hrs. - 2, 2, 2
Piano Literature: PR: Proficiency in an applied instrument or voice (200 level or above) or C.I. by audition. Survey of stringed keyboard literature from the sixteenth century to the present with emphasis on technical, formal and performance problems.

MUS 221, 222, 223  Qtr. Hrs. - 2, 2, 2
Song Literature: PR: Proficiency in an applied instrument or voice (200 level or above) or C.I. by audition. Survey of the development of the art song from the Middle Ages to the present with emphasis on technical, formal and performance problems.

MUS 299  Qtr. Hrs. - 4
Introduction to Music: (For non-majors). The study of music through listening, readings and discussions leading to greater enjoyment of music.

MUS 301, 302, 303  Qtr. Hrs. - 3, 3, 3
Counterpoint: 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  Qtr. Hrs. - 1
Madrigal Singers: PR: C.I. 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  Qtr. Hrs. - 1
Concert Choir: PR: C.I. by audition. May be repeated for credit. Study, rehearsal and performance of choral works of all styles and periods. Open to all students.

MUS 308  Qtr. Hrs. - 1
Concert Band: PR: C.I. by audition. Participation in a chamber or large ensemble for purposes of studying and performing band literature. Open to all students. May be repeated for credit.
<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>MUS 309</td>
<td>Qtr. Hrs. - 1</td>
<td>Philharmonic Orchestra:</td>
<td>PR: C.I. by audition. 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.</td>
</tr>
<tr>
<td>MUS 310</td>
<td>Qtr. Hrs. - 1</td>
<td>Chamber Music:</td>
<td>PR: C.I. by audition. Participation in small ensemble for purposes of studying and performing chamber music literature. May be repeated for credit.</td>
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<tr>
<td>MUS 311</td>
<td>Qtr. Hrs. - 2</td>
<td>Piano:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 312</td>
<td>Qtr. Hrs. - 2</td>
<td>Voice:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 313</td>
<td>Qtr. Hrs. - 2</td>
<td>String:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 314</td>
<td>Qtr. Hrs. - 2</td>
<td>Woodwind:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 315</td>
<td>Qtr. Hrs. - 2</td>
<td>Brass:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 316</td>
<td>Qtr. Hrs. - 2</td>
<td>Percussion:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 317</td>
<td>Qtr. Hrs. - 2</td>
<td>Organ:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 320-322</td>
<td>Qtr. Hrs. - 3, 3, 3</td>
<td>Orchestration and Score Reading:</td>
<td>PR: Proficiency in an applied instrument or voice (300 level or above) or Music Theory 203. Preliminary study of band and orchestral instruments through score reading. Scoring for band, orchestra and instrumental combinations.</td>
</tr>
<tr>
<td>MUS 340-342</td>
<td>Qtr. Hrs. - 3, 3, 3</td>
<td>Music History:</td>
<td>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.</td>
</tr>
<tr>
<td>MUS 350</td>
<td>Qtr. Hrs. - 2-5</td>
<td>Composition:</td>
<td>PR: MUS 303 or C.I. by audition. May be repeated for credit. Creative work in large and small forms in the area of choral, instrumental and keyboard media.</td>
</tr>
<tr>
<td>MUS 351</td>
<td>Qtr. Hrs. - 2</td>
<td>Choral Conducting:</td>
<td>PR: Junior standing. CR: MUS 320 or 321 or 322. Fundamental principles of choral conducting and rehearsal techniques.</td>
</tr>
<tr>
<td>MUS 352</td>
<td>Qtr. Hrs. - 2</td>
<td>Instrumental Conducting:</td>
<td>PR: Junior standing. CR: MUS 320 or 321 or 322. Fundamental principles of instrumental conducting and rehearsal techniques.</td>
</tr>
<tr>
<td>MUS 390</td>
<td>Qtr. Hrs. - 3</td>
<td>Fundamental Music Skills:</td>
<td>An introduction to the basic music skills - notation, rhythm, sight-singing, basic piano skills, dictation and fundamentals of conducting.</td>
</tr>
<tr>
<td>MUS 401-403</td>
<td>Qtr. Hrs. - 3, 3, 3</td>
<td>Form and Analysis:</td>
<td>PR: MUS 303. Senior standing or C.I. Formal aspects of the styles of major composers with an emphasis on orchestral literature.</td>
</tr>
<tr>
<td>MUS 411</td>
<td>Qtr. Hrs. - 2</td>
<td>Piano:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 412</td>
<td>Qtr. Hrs. - 2</td>
<td>Voice:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 413</td>
<td>Qtr. Hrs. - 2</td>
<td>String:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
<tr>
<td>MUS 414</td>
<td>Qtr. Hrs. - 2</td>
<td>Woodwind:</td>
<td>PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.</td>
</tr>
</tbody>
</table>
MUS 415 Qtr. Hrs. - 2
Brass: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 416 Qtr. Hrs. - 2
Percussion: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 417 Qtr. Hrs. - 2
Organ: PR: C.I. by audition. One hour private instruction per week. May be repeated for credit.

MUS 421 Qtr. Hrs. - 2-5
Piano: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 422 Qtr. Hrs. - 2-5
Voice: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 423 Qtr. Hrs. - 2-5
String: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 424 Qtr. Hrs. - 2-5
Woodwind: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 425 Qtr. Hrs. - 2-5
Brass: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 426 Qtr. Hrs. - 2-5
Percussion: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 427 Qtr. Hrs. - 2-5
Organ: PR: C.I. by audition. Hours of instruction are variable. May be repeated for credit.

MUS 450, 451, 452 Qtr. Hrs. - 3, 3, 3
Music of the Twentieth Century: PR: Senior standing or C.I. Problems of contemporary style; electronic methods, literary and technical points of view; analysis of selected works from Satie, Debussy, Stravinsky, Ravel, Bartok, Schoenberg, Berg, Webern, Cage, Babbitt, Badings, Carter, Ives, Stockhausen, Messiaen, Xenakis, Verese, Henze and others.

PHILOSOPHY

PHI 105 Qtr. Hrs. - 4
Non-Formal Logic: An examination of fallacies and other logical abuses in conjunction with an analysis of traditional modes in an attempt to encourage meaningful thought and usage.

PHI 205 Qtr. Hrs. - 4
Elementary Formal Logic: Basic analysis of patterns of inference; examination of logical form; development of elementary techniques for assessing validity of inferences.

PHI 221 Qtr. Hrs. - 4
Introduction to Philosophy: 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 Qtr. Hrs. - 4
Intermediate Formal Logic: PR: PHI 205. Systematic study of propositional and first-order predicate logic; logic systems and axiomatic method; problems of metatheory, including consistency, completeness and decidability.

PHI 312 Qtr. Hrs. - 4
Existentialism: 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 314 Qtr. Hrs. - 4
Problems in Contemporary Philosophy: Prominent issues in philosophies of the 20th century, apart from existentialism: logical positivism, linguistic analysis, phenomenology, and pragmatism.

PHI 331 Qtr. Hrs. - 4
Ethics: An examination of the nature of moral problems, judgments and principles with an emphasis on recent formulations in ethical theory.

PHI 341 Qtr. Hrs. - 4
Aesthetics: An investigation into the nature of human artistic experience with special reference to the problems of creativity.
PHI 405
Philosophy of Religion: Examination of basic ideas, beliefs, attitudes and functions of religion. The significance of religion in human experience.

PHI 407
Philosophy of Literature: An examination of fictional and non-fictional prose as it determines and reflects social, political, economic, and religious institutions. Includes works by Sartre, Feuchtwanger, and Zola.

PHI 409
Philosophy of Science: An examination of the conceptual foundations and methodology of modern science.

PHYSICS

PHYS 100, 101
Physical Science: Introduction to the basic principles of physical science. A study of selected topics emphasizing general concepts of the field. Familiarization with the basic laws governing our universe and man's environment. Recommended for satisfying the science requirements of the Environmental Studies Program.

PHYS 103
Astronomy: A descriptive survey of the properties of the solar system, the galaxies and the universe including the physical properties of stars as deduced from their radiation. Night observation sessions are included.

PHYS 107, 108
College Physics: 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: PR: PHYS 107. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 211, 212, 213
General Physics: CR: MATH 211. 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 281
Scientific Instruments Laboratory: PR: PHYS 107 or 103 or C.I. 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: PR: PHYS 211. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 304
Astronomy: PR: PHYS 103 or equivalent. A continuation of PHYS 103 with emphasis on stellar and galactic evolution, and recent discoveries in astronomy. Appropriate for the Environmental Studies Program.

PHYS 321
Intermediate Mechanics: PR: PHYS 211; CR: MATH 223; or C.I. A study of mechanics including vectors, coordinate transformations, fundamental theorems of Newtonian mechanics, rigid body dynamics and special relativity.

PHYS 325
Special Relativity: PR: PHYS 213 or equivalent; CR: MATH 223. Includes elementary special relativity invariants under Lorentz transformations in the four-vector formalism, and relativistic transformation of Coulomb's law to obtain the magnetic field of moving charges.

PHYS 331
Intermediate Electricity and Magnetism: PR: PHYS 212; CR: MATH 321; or C.I. An introduction to scalar and vector fields, electrostatics, electrodynamics, magnetism, Maxwell's equations, radiation, waveguides, and physical optics.
PHYS 341  Qtr. Hrs. 5
Modern Physics: PR: PHYS 213; CR: MATH 331; or C.I. 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  Qtr. Hrs. - 3
Modern Physics for Engineers: 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 345  Qtr. Hrs. - 3
Astrophysics: PR: PHYS 213 or equivalent. Elementary physics of stellar systems, including the theories of evolution of stars and planets, models of stellar interiors, properties of stellar atmospheres and stellar spectra of all wavelengths. Includes night sessions for photography and spectroscopy of celestial objects.

PHYS 354  Qtr. Hrs. - 3
Optics and Wave Motion for Engineers: PR: ENGR 211 and MATH 321. Selected topics in optics, acoustics, and related wave phenomena. A study of reflection, refraction, interference, and diffraction.

PHYS 371  Qtr. Hrs. - 5
Statistical Physics: PR: PHYS 341 or C.I. Quantum statistics in thermodynamics and kinetic theory.

PHYS 381  Qtr. Hrs. - 3
Physics Laboratory - Electronics: PR: PHYS 212; CR: MATH 223; or C.I. Lecture and laboratory work stressing electronic principles through the study of test equipment, power supplies, amplifiers, oscillators, and pulse circuits.

PHYS 382, 383  Qtr. Hrs. - 3, 3
Physics Laboratory - Intermediate: PR: PHYS 213 or C.I. Laboratory work in basic measurements of physical constants; intermediate level experiments in electronics, modern physics, nuclear physics, optics and solid state physics.

PHYS 451  Qtr. Hrs. - 3
Optics: PR: MATH and PHYS 331 or PHYS 354; or C.I. A study of modern approaches to refraction, interference, diffraction, polarization, scattering absorption and stimulated emission, spectroscopy and lasers.

PHYS 461  Qtr. Hrs. - 3
Solid State Physics: PR: PHYS 341 or C.I. Properties of solids, crystal binding, free electron model, band theory of solids, Fermi surface, and solid state applications.

PHYS 471  Qtr. Hrs. - 3
Quantum Mechanics: PR: PHYS 341 or C.I. A study of the postulates of quantum mechanics, the Schrodinger equation, and an introduction to the statistics of many particle systems.

PHYS 477  Qtr. Hrs. - 3
Nuclear Physics: PR: PHYS 341 and MATH 331; or C.I. Nuclear force, structure moments and models. Alpha decay, beta decay, gamma-ray emission, nuclear reactions and applications of nuclear physics.

PHYS 481, 482  Qtr. Hrs. - 3, 3
Physics Laboratory - Advanced: PR: PHYS 382 or C.I. Advanced laboratory experiments in electronics, atomic and molecular physics, nuclear physics, optics, solid state physics and astrophysics. Major emphasis placed on experimental design, data analysis and scientific writing.

POLITICAL SCIENCE

PCL 201  Qtr. Hrs. - 4
American National Government: A study of the dynamics of American national government, including its structure, organization, powers, and procedures.

PCL 203  Qtr. Hrs. - 4
Principles of Political Science: Scope of political science and its development as a field with emphasis on areas of concern; analysis of major approaches to the study of politics; familiarization with recent developments in research and research approaches.
PCL 300  Qtr. Hrs. - 4
State Government: PR: PCL 210, 203 or C.I. A comparative study of American state governments and political processes, with emphasis on Florida. Structures and functions of state governments will be considered as well as federal-state and state-local relations.

PCL 305  Qtr. Hrs. - 4
Political Parties and Processes: PR: PCL 201, 203 or C.I. Study of American politics with major emphasis upon the role, organization, functions, and processes of parties in the American political system.

PCL 308  Qtr. Hrs. - 4
The American Presidency: PR: PCL 201, 203 or C.I. 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  Qtr. Hrs. - 4
Congress and the Legislative Process: PR: PCL 201, 203 or C.I. The nature, role, and functions of the legislative process; the dynamics of executive-legislative relations and resultant problems.

PCL 321  Qtr. Hrs. - 4
International Relations: PR: PCL 201, 203 or C.I. Analysis of the fundamental principles and factors affecting interstate relations; the foreign policy decision-making processes of states; the role and problems of power; conflict and methods of resolution.

PCL 323  Qtr. Hrs. - 4
Contemporary International Politics: PR: PCL 201, 203 or C.I. 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  Qtr. Hrs. - 4
Comparative European Politics: PR: PCL 201, 203 or C.I. An analytical and comparative study of the major governments of Europe and their impact upon the development of types of political systems.

PCL 343  Qtr. Hrs. - 4
Politics of Developing Areas: PR: PCL 201, 203 or C.I. 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  Qtr. Hrs. - 4
American Political Philosophy: PR: PCL 201, 203 or C.I. 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  Qtr. Hrs. - 4
Political Behavior: PR: PCL 201, 203 or C.I. 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  Qtr. Hrs. - 4
Political Theory: PR: PCL 201, 203 or C.I. Examination of various normative and empirical approaches to the study of political science, stressing contemporary developments in the field.

PCL 410  Qtr. Hrs. - 4
Public Administration: PR: PCL 201, 203 or C.I. Analysis of administrative theories and the process of implementing public policies in a democratic society.

PCL 413  Qtr. Hrs. - 4
Metropolitan Politics: PR: PCL 201, 203 or C.I. Analysis of political patterns, processes and issues in American communities.

PCL 414  Qtr. Hrs. - 4
Metropolitan Administration I: PR: PCL 410 or 413 or C.I. Study of the formal and informal socio-political structures that govern urban areas; emerging patterns of government, and management practices in urban and suburban settings.
PCL 415  
Metropolitan Administration II: PR: PCL 410, 413 or C.I. The study of the legislative, administrative, and judicial aspects of government participation in urban development processes, and of the devices and techniques that have been developed to guide and implement these activities.

PCL 416  
Public Administration Internship: PR: C.I. Internship in municipal, county, state or federal government, including generalistic assignments or concentrations in such fields as personnel, planning, budget and fiscal, procurement, public safety, or housing and urban development for one quarter.

PCL 427  
American Foreign Policy: PR: PCL 201, 203 or C.I. 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: PR: PCL 201, 203 or C.I. The nature and growth of international agencies of cooperation. Attention focused on the problems and development of functional, regional, and universal organizations.

PCL 433  
International Law: PR: PCL 201, 203 or C.I. An introduction to the nature of evolution, and sources of international law and its role in interstate relations.

PCL 435  
Coercion in International Politics: PR: PCL 201, 203 or C.I. An inclusive examination of the role and utility of coercive techniques of interaction among states in a nuclear age ranging from low-tension producing techniques of diplomatic intervention through theories of nuclear strategy and deterrence.

PCL 440  
Comparative Public Administration I: PR: PCL 201, 203 or C.I. An analysis of administrative structures and processes of selected countries, including an evaluation of the influence of economic, social and political environment on bureaucratic functions and the role of the executive.

PCL 441  
Comparative Public Administration II: PR: PCL 201, 203 or C.I. A case study approach to the problems of administration in diverse political environments stressing such functional aspects of bureaucratic and administrative behavior and process as patterns of organization, personnel systems, field services, administrative style and the political power position of the bureaucracy.

PCL 450  
American Public Policy: PR: PCL 201, 203 or C.I. The American policy-making process with a focus upon contemporary problems including the political impact of the “New Economics,” government and business relations, wealth and income inequality, the malapportionment of societal power and social conflict.

PCL 461  
Political Philosophy: PR: PCL 201, 203 or C.I. Study of the development of political and social ideas in Western thought from early Greece to the Renaissance.

PCL 462  
Political Philosophy: PR: PCL 201, 203 or C.I. Renaissance to the 19th Century.

PCL 463  
Political Philosophy: PR: PCL 201, 203 or C.I. Study of contemporary Western political and social thought in the 19th and 20th Centuries.

PCL 471  
American Constitutional Law: PR: PCL 201, 203 or C.I. The impact of judicial decision-making upon the growth of American political institutions and processes.

PCL 473  
American Constitutional Law: PR: PCL 201, 203 or C.I. The role of the judiciary in the focusing and refinement of individual rights and civil liberties in American society.

PSYCHOLOGY

PSY 201, 202  
General Psychology: The basic principles, theories, and methods of contemporary psychology.
PSY 300  Qtr. Hrs. - 3
Applied Psychology: Applications of principles of psychology to personal adjustment, industry, and education.

PSY 301  Qtr. Hrs. - 4

PSY 302  Qtr. Hrs. - 4

PSY 303  Qtr. Hrs. - 4

PSY 304  Qtr. Hrs. - 4

PSY 305  Qtr. Hrs. - 4

PSY 306  Qtr. Hrs. - 4
Psychology of Adjustment: Psychological principles of adjustment, application of psychology to problems in living.

PSY 307  Qtr. Hrs. - 4

PSY 308  Qtr. Hrs. - 4

PSY 309  Qtr. Hrs. - 4

PSY 310  Qtr. Hrs. - 4

PSY 311  Qtr. Hrs. - 3

PSY 312  Qtr. Hrs. - 4

PSY 313  Qtr. Hrs. - 4

PSY 314  Qtr. Hrs. - 4
Industrial Psychology: PR: PSY 201, 202, STAT 201. Psychological principles of employee selection, training, and morale.

PSY 321  Qtr. Hrs. - 4
Principles of Behavior Modification: PR: PSY 301. An examination of the control of behavior through applications of principles and theories of learning. Examples are drawn from clinical and social psychology, and from child rearing.

PSY 322  Qtr. Hrs. - 4
Clinical Psychology Research Practicum: PR: PSY 301, 310, 311. Research and practicum experience in mental health related facilities located in the immediately surrounding area.

PSY 323  Qtr. Hrs. - 4
Comparative Psychology: PR: PSY 201, 202. A study of comparative behaviors of lower animals.

PSY 333  Qtr. Hrs. - 4
Development of Language and Conceptual Behavior: PR: PSY 301. Normal ontogeny of language and conceptual behavior from infancy to adulthood; disorders of linguistic and conceptual development and their remediation; key theoretical interpretations.
PSY 340  
Environmental Psychology: PR: PSY 201, 202, STAT 201. An investigation of theory and research relevant to the relationship between the physical environment and the behavior of man.

PSY 343  
Educational Psychology: PR: PSY 201, 202. Application of psychological principles and research methods to classroom behavior and learning.

PSY 390  
Undergraduate Field Work: Placement in a community agency for supervised experience in applications of psychology to community problems.

PSY 401  
Senior Research Proposal: 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 403  

PSY 405  
History and Systems of Psychology: PR: PSY 301, 309. Historical development of psychology with emphasis on classical theoretical positions.

PSY 408  

PSY 415  

PSY 605  

PSY 606  
Psychological Testing II: PR: Graduate admission and C.I. An examination of the most commonly used instruments in psychological testing and a critical evaluation of their potential utility.

PSY 607  
Human Motivation: PR: Graduate admission and C.I. Survey of the area of human motivation with emphasis on empirical findings.

PSY 608  
Advanced Social Psychology and Group Processes: PR: Graduate admission and C.I. Consideration of the results of studies in group processes, including communication networks, leadership, and interpersonal bargaining behavior.

PSY 609  
Experimental Personality: PR: Graduate admission and C.I. Survey of the area of personality theory with emphasis on the experimental foundations of the various theories.

PSY 610  
Psychology of Individual Differences: PR: Graduate admission and C.I. A survey of the problems or measurement and areas of difference between individuals.

PSY 612  
Counseling Psychology: PR: Graduate admission and C.I. Various theories of counseling and their evaluated efficiency, including the problems of research in counseling techniques.

PSY 615  
Counseling Practicum: PR: Graduate admission and C.I. Application of counseling techniques in a supervised setting.
PSY 620 Qtr. Hrs. - 4
Information Processing and Decision Making: PR: Graduate admission and C.I. Application of statistical principles and decision theories to the decision making process. Application of computers to managerial decisions.

PSY 640 Qtr. Hrs. - 4
Consumer Psychology: PR: Graduate admission and C.I. Application of psychology to consumer behavior. Survey of research in product selection, markets, and advertising.

PSY 641 Qtr. Hrs. - 4
Organizational Psychology: PR: Graduate admission and C.I. Survey of present theories in Organizational Psychology. Application of psychological research to organizational functioning.

PSY 650 Qtr. Hrs. - 4

PSY 651 Qtr. Hrs. - 4

PSY 660 Qtr. Hrs. - 3
Industrial Psychology Practicum I: PR: Graduate admission and C.I. Supervised research in industry.

PSY 661 Qtr. Hrs. - 3
Industrial Psychology Practicum II: PR: Graduate admission and C.I. Supervised research in industry.

PSY 662 Qtr. Hrs. - 3
Industrial Psychology Practicum III: PR: Graduate admission and C.I. Supervised research in industry.

PSY 670 Qtr. Hrs. - 3
Teaching and Training Evaluation: PR: Graduate admission and C.I. Evaluation of effective teaching methods and practicum experience.

RADIO/TELEVISION

RTV 140 Qtr. Hrs. - 4
Foundations of Broadcasting: Nature of the media, the mechanics of operation, history, economics, programing, and internal and external control.

RTV 242 Qtr. Hrs. - 4
Broadcast Techniques: Introduction to the radio and television studio. Utilization of studio operating techniques and equipment (consoles, recorders, cameras, etc.) for use in educational and commercial broadcasting.

RTV 340 Qtr. Hrs. - 4
Audio Production: PR: RTV 242 or C.I. The production of music (live and recorded), talk, interview, discussion, sports, and documentary including performance (talent and announcing) and direction.

RTV 341 Qtr. Hrs. - 4
Television Production: PR: RTV 242 or C.I. Emphasis on the coordination of talent, cameras, visuals, audio and lighting with the dramatic values of the presentation.

RTV 342 Qtr. Hrs. - 4
Broadcast Journalism I: PR: COM 319 or C.I. Historical, legal, and quasi-legal influences on broadcast news; introduction to news sources, writing and interviewing techniques for radio-television news.

RTV 344 Qtr. Hrs. - 4
Broadcast Continuity and Programming I: 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 Qtr. Hrs. - 4
Film for Television: Principles and practices of 8mm and 16mm film usage within the television industry.

RTV 441 Qtr. Hrs. - 4
Television Directing: 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.
RTV 444  Qtr. Hrs. - 4
Broadcast Continuity and Programming II: PR: RTV 344 or C.I. Preparation of documentaries and dramatic writing for television and radio.

RTV 445  Qtr. Hrs. - 4
Television Film Production: PR: C.I. Planning and preparation of filmed documentaries, public service and commercial productions. (Laboratory hours to be arranged.)

RTV 446  Qtr. Hrs. - 4
Radio, Television and Society: A study of the impact of electronic media upon the habits, customs and thinking of our times. Considerations of internal media problems.

RTV 448  Qtr. Hrs. - 4
Broadcast Regulations: PR: RTV 140 or RTV 342. Federal, state, local and self-regulator agencies and practices which govern electronic media.

RTV 450  Qtr. Hrs. - 4

RTV 451  Qtr. Hrs. - 3
Radio-Television Advertising: PR: COM 434 or C.I. Radio and television as advertising media; advertisers' demands and budget; appropriate programs for the sponsors' needs; writing of commercial continuity.

RTV 452  Qtr. Hrs. - 4
Broadcast Criticism: Evaluation and criticism of past and present radio and television programs, policies, and critics. Concentration on the problem of criteria development.

RTV 453  Qtr. Hrs. - 4
Educational Broadcasting: 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  Qtr. Hrs. - 4
Instructional Broadcasting: 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.

RTV 455  Qtr. Hrs. - 4
International Broadcasting: Comparative analysis of national broadcast systems. World broadcasting as a social, political and economic force.

RTV 458  Qtr. Hrs. - 4
Broadcast Management: PR: RTV 448. Consideration of broadcast management problems in station operations at the local, regional, and national levels.

REL 300  Qtr. Hrs. - 4
The Hebrew and Christian Heritage: Same as HUM 300.

REL 315  Qtr. Hrs. - 4
The Religious Heritage of China & Japan: Same as HUM 315.

REL 317  Qtr. Hrs. - 4
The Religious Heritage of India: Same as HUM 317.

REL 318  Qtr. Hrs. - 4
The Religious Heritage of Islam: Same as HUM 318.

REL 321  Qtr. Hrs. - 4
Religion in America: 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  Qtr. Hrs. - 4

RUS 101  Qtr. Hrs. - 3
Elementary Russian Language and Civilization: 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  Qtr. Hrs. - 3
Elementary Russian Language and Civilization: PR:
RUS 101 or equivalent. Continuation of RUS 101.

RUS 103  Qtr. Hrs. - 3
Elementary Russian Language and Civilization: PR:
RUS 102 or equivalent. Continuation of RUS 102.

RUS 201  Qtr. Hrs. - 3
Intermediate Russian Language and Civilization: PR:
RUS 103 or equivalent. Designed to continue develop­
ment 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  Qtr. Hrs. - 3
Intermediate Russian Language and Civilization: PR:
RUS 201 or equivalent. Continuation of RUS 201.

RUS 203  Qtr. Hrs. - 3
Intermediate Russian Language and Civilization: PR:
RUS 202 or equivalent. Continuation of RUS 202 with
greater emphasis on Russian civilization from the Middle
Ages to the present.

RUS 301  Qtr. Hrs. - 4
Russian Composition: 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  Qtr. Hrs. - 4
Russian Conversation: PR: RUS 203 or equivalent.
Development of skills in conversation and comprehension
through practice and systematic review of phonology and
grammatical structure.

SOCIAL SCIENCE

SSC 490  Qtr. Hrs. - 2
Senior Seminar: Social Sciences in Human Affairs: An
overview of the development, purposes, and functioning
of the social sciences in modern society. Primarily
intended for senior students. Offered as one of the
Advanced Environmental Studies seminars. Not open to
the students in the College of Social Sciences.

SOCIOLOGY

Introductory Sequence: SOC 201, 202.


Anthropology Concentration: SOC 310, 311, 314, 315, 316,
402.

Social Welfare Concentration: SOC 340, 341, 342, 343, 412,
498.

Social Organization: SOC 325, 326, 333, 335, 407, 411,
416.


SOC 201, 202  Qtr. Hrs. - 3, 3
General Sociology: 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  Qtr. Hrs. - 4
The Development of Social Thought: PR: SOC 201. An
overview of theories concerning the nature of man as a
"social being." The nature of society, from the beginnings
of the scientific study of man's social life to World War II.
SOC 306  Qtr. Hrs. - 4
Modern Sociological Thought: PR: SOC 201, 304. A study of major European and American contributors to, and schools of, modern sociology from World War II to the present.

SOC 307  Qtr. Hrs. - 4
The Sociology of Religion: Patterns in religious behavior in various societies with primary emphasis on myth, rite, taboo and festival as social phenomena.

SOC 310  Qtr. Hrs. - 4
Physical Anthropology and Archeology: An introduction to the principles of anthropology. Inquiry into the natural history of mankind, man’s place among the primates, and evolution. Review of evidence of earlier sociocultural framework, prehistory, and archeological background bearing on man’s past achievements.

SOC 311  Qtr. Hrs. - 4
Social Anthropology: Framework and principles of sociocultural organization as exemplified among various cultures and ethnic groups around the world. Deals with kinship subsistence techniques, political structure language, culture and personality, and other topics which combine to form the “holistic approach” of anthropology.

SOC 312  Qtr. Hrs. - 4
Old World Prehistory: PR: SOC 310, 311. An introduction to the emergence of prehistoric archeology as a discipline, review of fundamental theoretical approaches to prehistory, and survey of the archeological evidence for prehistoric cultural manifestations in the Old World from earliest times to the emergence of certain civilizations.

SOC 313  Qtr. Hrs. - 4
New World Prehistory: PR: SOC 310, 311. An introductory to the development of archaeological methods and theories in the New World, development of certain space-time frameworks and surveys of some findings concerning Pre-Columbian peoples.

SOC 314  Qtr. Hrs. - 4
Cultural Anthropology: PR: SOC 310, 311. Emergence and history of man’s cultures, their evolution and development, and the structure and functioning of human cultures in every time and place.

SOC 315  Qtr. Hrs. - 4
Physical Anthropology: PR: SOC 310, 311. The study of man as a product of the evolutionary process. Study and analysis of diversity among present human populations.

SOC 316  Qtr. Hrs. - 4
Comparative Social Organization: PR: SOC 310, 311. Introduction to anthropological viewpoints on role of marriage, family, kin groups, and descent as focal points for the study of economic, political and ideological aspects of social organization.

SOC 317  Qtr. Hrs. - 4

SOC 318  Qtr. Hrs. - 4
Collective Behavior: PR: SOC 201. An analysis of the way in which new social groupings arise from unstructured situations. Standard topics include behavior of mobs, riots, crowds and spatially dispersed collectives.

SOC 320  Qtr. Hrs. - 4
Urban Sociology: PR: SOC 201. 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  Qtr. Hrs. - 4

SOC 331  Qtr. Hrs. - 4
Social Problems: PR: SOC 201. 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  Qtr. Hrs. - 4
Industrial Sociology: PR: SOC 201. Application or development of principles of sociology relevant to the industrial mode of production and the industrial way of life.

SOC 335  Qtr. Hrs. - 4
Social Institutions: PR: SOC 201. Social institutions, social differentiation, and social control, with emphasis on American and other modern societies.

SOC 336  Qtr. Hrs. - 4
Social Stratification: PR: SOC 201. Study of class, status and power; cultural variations in stratification system; patterns of mobility and change.

SOC 340  Qtr. Hrs. - 4
Social Welfare: A social Institution: PR: SOC 201. 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  Qtr. Hrs. - 4

SOC 342  Qtr. Hrs. - 4

SOC 343  Qtr. Hrs. - 4
The Community and Social Welfare: PR: SOC 340. 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 344  Qtr. Hrs. - 4
Sociology of Deviant Behavior: PR: SOC 201. An examination of the nature, types and societal reactions to deviant behavior; special emphasis on the process of stigmatization and the emergence of deviant subcultures.

SOC 345  Qtr. Hrs. - 4
Juvenile Delinquency: PR: SOC 201. Types of delinquent behavior found among juveniles, possible causes and ways society attempts to treat the various forms of delinquency.

SOC 346  Qtr. Hrs. - 4

SOC 347  Qtr. Hrs. - 4
Sociology of Mental Illness: A sociological examination of mental illness as a social problem; legal aspects of mental illness, and the mental health professions.

SOC 348  Qtr. Hrs. - 4
Sociology of Alcoholism: PR: SOC 201. Introduction to the nature of alcoholism and review of its impact on society.

SOC 352  Qtr. Hrs. - 4
Race and Ethnic Minorities in the United States: PR: SOC 201. 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  Qtr. Hrs. - 4
Culture and Personality: PR: SOC 201. Theories of the variations in personality in relation to culture and group life in tribal and modern societies.

SOC 354  Qtr. Hrs. - 4
Sociology of Adolescence: PR: SOC 201. 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 360  Qtr. Hrs. - 4
SOC 362 Qtr. Hrs. - 4
Contemporary Woman and Society: PR: SOC 201. An introduction to the changing system of the American Woman in contemporary society with emphasis on the political, historical, economic, and cultural forces influencing her role.

SOC 380 Qtr. Hrs. - 4

SOC 402 Qtr. Hrs. - 4
Method and Theory in Anthropology: PR: SOC 310, 311. Central methodological and theoretical concerns of anthropology in its emergence as a separate discipline and field of study. Cultural evolutionism, diffusionism, historical particularism, functionalism and their role in the development of anthropology.

SOC 403 Qtr. Hrs. - 4
Anthropological Linguistics: PR: SOC 310, 311, ENG 371. Survey of anthropological linguistic field techniques in non-native cultures and application of linguistic theories to study of socio-cultural systems.

SOC 406 Qtr. Hrs. - 4
Social Gerontology: PR: SOC 201. An examination of the sociological aspects of aging in the contemporary United States. Special needs of the aged in housing, leisure, employment income maintenance, recreation and health, will be considered as well as programs and services designed to meet their needs.

SOC 407 Qtr. Hrs. - 4
The Family: PR: SOC 201. The study of the family as a social institution. The family through history, and the family cross-culturally. The modern American family as a distant social and cultural complex. Changes in the family system. Courtship and marriage.

SOC 408 Qtr. Hrs. - 4
Social Change in Developing Areas: PR: SOC 201 and one course in statistics. A study of growth problems in the emerging nations of Africa and Latin America.

SOC 411 Qtr. Hrs. - 4
Demography: PR: SOC 201. Concerned with the study of human population, its distribution, composition and change.

SOC 412 Qtr. Hrs. - 5
Field Experience and Seminar: 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 Qtr. Hrs. - 4
Human Ecology: PR: SOC 201. Principles governing the spatial distribution of human populations and activities within an area.

SOC 451 Qtr. Hrs. - 4
Contemporary Social Movements: PR: SOC 201. Causes and effects of various social movements in American society compared to large-scale upheavals throughout the West. Considers various theories of explanation.

SPANISH

SPA 101 Qtr. Hrs. - 3
Elementary Spanish Language and Civilization: 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 Qtr. Hrs. - 3
Elementary Spanish Language and Civilization: PR: SPA 101 or equivalent. Continuation of SPA 101.

SPA 103 Qtr. Hrs. - 3
Elementary Spanish Language and Civilization: PR: SPA 102 or equivalent. Continuation of SPA 102.

SPA 201 Qtr. Hrs. - 3
Intermediate Spanish Language and Civilization: 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Qtr. Hrs.</th>
<th>Description</th>
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<tbody>
<tr>
<td>SPA 202</td>
<td>Intermediate Spanish Language and Civilization: PR: SPA 201 or equivalent. Continuation of SPA 201.</td>
<td>3</td>
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<tr>
<td>SPA 203</td>
<td>Intermediate Spanish Language and Civilization: PR: SPA 202 or equivalent. Continuation of SPA 202 with greater emphasis on Spanish civilization from the Middle Ages to the present.</td>
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<tr>
<td>SPA 301</td>
<td>Spanish Composition: 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.</td>
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<tr>
<td>SPA 303</td>
<td>Spanish Conversation: PR: SPA 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.</td>
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<tr>
<td>SPA 311</td>
<td>Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance and Baroque.</td>
<td>3</td>
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<tr>
<td>SPA 312</td>
<td>Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works of the eighteenth and nineteenth centuries.</td>
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<tr>
<td>SPA 313</td>
<td>Survey of Spanish Literature: PR: SPA 203 or equivalent. Main literary currents and works from the Generation of 1898 to the present.</td>
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<tr>
<td>SPA 316</td>
<td>Survey of Latin-American Literature I: PR: SPA 203 or equivalent. Main literary currents and works from the colonial period to the nineteenth century.</td>
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<tr>
<td>SPA 317</td>
<td>Survey of Latin-American Literature II: PR: SPA 203 or equivalent. Main literary currents and works of the nineteenth century.</td>
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<tr>
<td>SPA 318</td>
<td>Survey of Latin-American Literature III: PR: SPA 203 or equivalent. Main literary currents and works of the twentieth century.</td>
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<tr>
<td>SPA 401</td>
<td>Spanish Phonetics and Diction: PR: SPA 303 or equivalent. Spanish phonology with emphasis on phonetic groupings.</td>
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<td>SPA 424</td>
<td>Cervantes II: PR: SPA 311. <em>Don Quixote.</em> (Part II).</td>
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<tr>
<td>SPA 441</td>
<td>Nineteenth Century Spanish Literature: PR: SPA 312. Romanticism in Spanish literature.</td>
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<tr>
<td>SPA 442</td>
<td>Nineteenth Century Spanish Literature: PR: SPA 312. The realistic and naturalistic novel in Spain.</td>
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<tr>
<td>SPA 443</td>
<td>The Generation of 1898: PR: SPA 313. A study of the Generation's main authors and their works.</td>
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<tr>
<td>SPA 451</td>
<td>Twentieth Century Spanish Literature: PR: SPA 313. The contemporary Spanish novel.</td>
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<tr>
<td>SPA 452</td>
<td>Twentieth Century Spanish Literature: PR: SPA 313. Contemporary Spanish drama and poetry.</td>
<td>3</td>
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</tbody>
</table>
SPE 101 Qtr. Hrs. - 3
Fundamentals of Oral Communication: Use of the body and voice; participation in various speaking situations; planning, organizing, and delivering public speeches.

SPE 261 Qtr. Hrs. - 5
English Phonetics and American Dialects: Physiological description and visual notation of speech sounds; regional dialects of American English.

SPE 262 Qtr. Hrs. - 3
Psychology of Oral Communication: Psychological principles involved in the communicative process with application to individuals and groups.

SPE 360 Qtr. Hrs. - 4
Argumentation and Debate: PR: SPE 101 or C.I. Study and practice in the preparation and delivery of argumentative speeches emphasizing argument, evidence and organization.

SPE 361 Qtr. Hrs. - 4
Persuasion: Motivation: PR: SPE 101 or C.I. A study of motivational factors involved in persuasive speaking to secure belief and action.

SPE 362 Qtr. Hrs. - 4
Platform Speaking: PR: SPE 101 or C.I. 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 364 Qtr. Hrs. - 5
Physical Bases of Speech and Hearing: An introduction to the anatomical, physiological, and physical elements underlying the communication process.

SPE 365 Qtr. Hrs. - 2
Parliamentary Procedure: Principles and rules governing participation and leadership in the conduct of informal business meetings.

SPE 366 Qtr. Hrs. - 4
Speech Composition: PR: SPE 101 or C.I. Study and practice in the preparation and delivery of speeches from manuscripts with emphasis on the development of oral style.

SPE 371 Qtr. Hrs. - 3
Speech and Human Relations: Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 440 Qtr. Hrs. - 4
Problems of Articulation, Delayed Speech and Language: PR: SPE 261, 364 and PSY 333. Aspects of diagnosis; emphasis on planning and executing correctional programs.

SPE 445 Qtr. Hrs. - 4

SPE 450 Qtr. Hrs. - 5
Hearing Habilitation and Voice Therapy: PR: SPE 261, 345, 364 and PSY 333. Lip reading, auditory training, speech conservation and speech improvement for the hearing handicapped; training for voice problems of varying origin.

SPE 452 Qtr. Hrs. - 5
Speech and Language Problems in Stuttering and Organic Disorders: PR: SPE 261, 364, 440, and PSY 333. A survey of team diagnostic and planning approaches; the Speech Pathologist's role in management of communication aspects of disorders.

SPE 453 Qtr. Hrs. - 4
Observation and Clinical Practice I: PR: SPE 440, 450, 452 or C.I. Directed participation in planning and carrying out therapeutic programs with varied speech and hearing problems.

SPE 454 Qtr. Hrs. - 4
Observation and Clinical Practice II: PR: SPE 440, 450, 452 or C.I. Directed participation in planning and carrying out therapeutic programs with varied speech and hearing problems.
SPE 468  Qtr. Hrs. - 5
Survey of Rhetoric:  General Survey:  Major rhetorical
trends from the classical era to the present.  Comparison of
Aristotelian rhetorics.  Contributions of principal figures
will be discussed.

SPE 469  Qtr. Hrs. - 4
Survey:  Language and Speech Problems:  A survey of
speech, language and hearing problems.  For classroom
teachers, administrators and anyone interested in an
introduction to the field of Speech Pathology.

SPE 470  Qtr. Hrs. - 4
History and Criticism of American Public Address:  Rhetor­
cical criticism of speaking and writing of American
statesmen who have had an influence on political, social,
and economic milieu of their times.

SPE 471  Qtr. Hrs. - 4
History and Criticism of British Public Address:  Rhetor­
cical criticism of speaking and writing of British
statesmen who have had an influence on political, social,
and economic milieu of their times.

SPE 472  Qtr. Hrs. - 4
Rhetoric of Social and Political Action:  PR:  Junior
standing.  A critical investigation of social and political
speaking within contemporary American society including
agitator rhetoric of social and political dissent.

SPE 473  Qtr. Hrs. - 3
Directing Extracurricular Speech Activities:  Debate, ex­
temporaneous speech and other speech events; selection
and training of contestants; interschool and intramural
speech activities.

STATISTICS

STAT 201  Qtr. Hrs. - 4
Principles of Statistics:  A lecture-laboratory course de­
signed to introduce the student to statistical concepts in
modern society.  An introduction to basic principles,
frequency distributions, measures of location and dis­
perion, probability, probability distributions, statistical in­
fERENCE.

STAT 301  Qtr. Hrs. - 4
Fundamentals of Probability and Statistics:  PR:  Four
years of high school mathematics or MATH 110 or
equivalent.  A lecture-laboratory course designed to intro­duce
students to the ideas of statistical inference and prepare them for other courses in statistics.

STAT 321  Qtr. Hrs. - 4
Business and Economic Statistics:  PR:  ECON 203,
MATH 115, and STAT 301.  The use of statistical methods
as scientific tools in the analysis of economic and business
problems.  Emphasis is placed upon the collection,
analysis, and interpretation of quantitative economic and
business data.  (Same as ECON 321.)

STAT 332  Qtr. Hrs. - 3
Statistical Quality Control:  Statistical concepts and
methods applied to the control of quality of manufactured products.  (Same as IEMS 332.)

STAT 335  Qtr. Hrs. - 3
Probability and Statistics for Engineers:  PR:  MATH
223.  Axioms of probability; combinatorial and geo­
metrical 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  Qtr. Hrs. - 3, 3, 3
Mathematical Statistics:  PR:  MATH 223 and a course in
statistics.  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  Qtr. Hrs. - 4, 4
Statistical Methods:  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 analysing data from experiments and surveys;
statistical concepts and models; estimation; tests of
hypotheses; regression and correlation; analysis of variance
and covariation; an introduction to the principles of the statistical design of experiments and surveys.
STAT 411  Qtr. Hrs. - 3
Experimental Design: 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  Qtr. Hrs. - 3
Survey Design: 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 447, 448  Qtr. Hrs. - 3, 3

STAT 535  Qtr. Hrs. - 3
Probability for Engineers: PR: STAT 335. Engineering application of probability, combinatorial analysis, sample space, events, probability, discrete and continuous random variables, and probability distributions. Same as IEMS 502.

STAT 536  Qtr. Hrs. - 3
Statistics for Engineers: PR: STAT 335. Engineering application of statistics, significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation. (Same as IEMS 503.)

THEATRE

THA 180  Qtr. Hrs. - 3
Study of Drama and Theatre: Nature of drama and the theatre, and basic principles of play analysis.

THA 230  Qtr. Hrs. - 3
Interpretation I: 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 240  Qtr. Hrs. - 4

THA 280  Qtr. Hrs. - 4
Introduction to Acting: Prepares the beginning actor for University Theatre productions. Emphasis on movement, motivation, voice, characterizational techniques, makeup, and other basic requirements for acting.

THA 290  Qtr. Hrs. - 2
Theatre Practicum: PR: Permission of Instructor. Open to all students interested in participating in the productions of the University Theatre. Primarily an activity course; student will have the opportunity for supervised work in all phases of theatrical production. May be repeated for credit.

THA 310  Qtr. Hrs. - 4
History of the Motion Picture: Development of the film industry; its social and economic impact. (Same as COM 310.)

THA 320, 321, 322  Qtr. Hrs. - 1, 1, 1
Theatre Practice II: PR: THA 240. Practical experience in designing and operating technical aspects of dramatic productions. (Service on crews is required.)

THA 330  Qtr. Hrs. - 3
Interpretation II: 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  Qtr. Hrs. - 3
History of the Theatre: Classic and Renaissance: Development of theatre art from the earliest times through the sixteenth century.

THA 332  Qtr. Hrs. - 3
History of the Theatre XVII and XVIII Centuries: Development of theatre art from the Renaissance through the neo-classic period to the beginning of the Romantic Movement.
THA 333  Qtr. Hrs. - 3
History of the Theatre: XIX and XX Centuries: Development of theatre art from the Romantic Period to the modern theatre.

THA 341  Qtr. Hrs. - 4
Drama Development I: A study of dramatic works in translation of the Greeks, Romans, and the Medieval Theatre. Extensive readings in the plays of these periods should be expected.

THA 342  Qtr. Hrs. - 4
Drama Development II: A study of dramatic works in translation of the French, German, Spanish, and Italian theatres in the 16th and 17th centuries. Extensive readings in the plays of these periods should be expected. Continuation of THA 341.

THA 343  Qtr. Hrs. - 4
Drama Development III: Continuation of THA 341-342 tracing the development of dramatic works in translation of the 18th and 19th centuries. Extensive readings of plays from the French, German, English, Spanish, Italian, and Russian theatres.

THA 380  Qtr. Hrs. - 3
Directing I: 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  Qtr. Hrs. - 4
Scene Design I: Study and practice of scene design; perspective drawing, fundamentals of design, and techniques of scene painting. (Service on crew as required.)

THA 382  Qtr. Hrs. - 4
Stage Lighting: PR: Junior standing. Study of stage lighting techniques, practices, and equipment. (Service on light crew is required.)

THA 421  Qtr. Hrs. - 3
Dramatic Theory: PR: C.I. 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  Qtr. Hrs. - 4
High School Play Directing: 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  Qtr. Hrs. - 3
Contemporary Theatre and Drama: Trends in theatrical production and dramatic literature in Italy, France, Germany, Russia, and the Scandinavian countries.

THA 424  Qtr. Hrs. - 3
Principles of Motion Picture Art: PR: THA 310 or C.I. Aesthetic consideration of the motion picture as art; critical criteria and stylistic comparisons are established through the viewing of films, reading assignments, and discussion.

THA 425  Qtr. Hrs. - 3
Dramatic Criticism: PR: C.I. Analysis of the nature of past and present day criticism of the drama; practical work in such criticism.

THA 434  Qtr. Hrs. - 3
Modern Motion Picture Technique: PR: THA 310 or C.I. An examination of the techniques of motion picture as art; directing, acting, editing, writing, cinematography.

THA 480  Qtr. Hrs. - 3
Directing II: 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  Qtr. Hrs. - 3
Acting II: PR: THA 280. 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  Qtr. Hrs. - 4
Advanced Scene Design: 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  Qtr. Hrs. - 3
American Theatre and Drama: XVIII & XIX Centuries: 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  Qtr. Hrs. - 3
American Theatre: XX Century: 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  Qtr. Hrs. - 3
Creative Dramatics and Children’s Theatre: An introduction to the aesthetic 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  Qtr. Hrs. - 3

ZOBOLOGY

ZOOL 100  Qtr. Hrs. - 4
General Zoology: PR: BIOL 100 or 103. Introduction to zoology; structure, function and representative groups; current concepts in zoological sciences.

ZOOL 220, 221  Qtr. Hrs. - 4, 4
Comparative Vertebrate Anatomy: PR: ZOOL 100. The vertebrate animals; relationship of organs and systems; and their phylogentic significance.

ZOOL 224  Qtr. Hrs. - 5
Human Anatomy: PR: BIOL 100 or equivalent. Structure of the human body. Not open to students with credit in ZOOL 220, 221 or equivalent.

ZOOL 240  Qtr. Hrs. - 5
Invertebrate Zoology: PR: ZOOL 100. Taxonomy, anatomy and ecology of the invertebrate animals.

ZOOL 310  Qtr. Hrs. - 4
Histological Technique: PR: ZOOL 100 or C.I. Preparation of tissues for microscopic study; paraffin and cryostat methods; use of microtome; staining procedures; whole mounts.

ZOOL 320  Qtr. Hrs. - 5
Comparative Vertebrate Embryology: PR: ZOOL 220-221. Embryology of the vertebrates; fertilization of egg; stages of cleavage; development of organs and systems.

ZOOL 322  Qtr. Hrs. - 4
Vertebrate Histology: PR: ZOOL 100. Anatomy, structure and function of major cell types and tissues.

ZOOL 330  Qtr. Hrs. - 5
Animal Physiology: PR: BIOL 332 or C.I. Function and interrelationships of nervous, endocrine, muscle, reticuloendothelial, reproductive, excretory, respiratory and digestive systems.

ZOOL 334  Qtr. Hrs. - 3
Human Physiology: PR: BIOL 100 or equivalent. The physiology and interrelationships of organ systems of the body.

ZOOL 335  Qtr. Hrs. - 2
Human Physiology Laboratory: PR: BIOL 100 or equivalent. Laboratory exercises illustrating the physiological principles included in ZOOL 334. Must be taken concurrently with ZOOL 334 when required by curriculum.

ZOOL 340  Qtr. Hrs. - 4
Vertebrate Zoology: PR: 8 hours of zoology or C.I. Emphasis on evolution and classification followed by an introduction to vertebrate ecology, natural history and behavior.
ZOOL 345  Qtr. Hrs. - 4
General Entomology: PR: ZOOL 100. Introduction to insects; their identification, biology and ecology.

ZOOL 355  Qtr. Hrs. - 3
Game Conservation and Management: PR: ZOOL 100. Principles of conservation and management; habitat improvement; wildlife techniques; public relations.

ZOOL 370  Qtr. Hrs. - 5
Animal Parasitology: 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 375  Qtr. Hrs. - 3
Vertebrate Ethology: PR: ZOOL 100. Classical ethology, modern experimental ethology and behavioral ecology are considered.

ZOOL 440  Qtr. Hrs. - 3
Principles of Zoological Systematics: PR: BIOL 460 and 15 hours of zoology courses of 300 level or above. Theory and practice of taxonomy and classification of animals; introduction to the International Code of Zoological Nomenclature.

ZOOL 445  Qtr. Hrs. - 4
Ichthyology: PR: 8 hours of zoology or C.I. Introduction to the biology of the fishes, their classification, evolution and life histories.

ZOOL 446  Qtr. Hrs. - 4
Herpetology: PR: 8 hours of zoology or C.I. Introduction to the biology of the amphibians and reptiles, their classification, evolution and life histories.

ZOOL 447  Qtr. Hrs. - 4
Ornithology: PR: 8 hours of zoology or C.I. Introduction to the biology of birds, their classification, evolution and life histories.

ZOOL 448  Qtr. Hrs. - 4
Mammalogy: PR: 8 hours of zoology or C.I. Introduction to the biology of mammals, their classification, evolution and life histories.

ZOOL 450  Qtr. Hrs. - 4

ZOOL 452  Qtr. Hrs. - 4
Lake and Stream Management: PR: ZOOL 450. The ecology of freshwater fishes; techniques of aquatic research.

ZOOL 453  Qtr. Hrs. - 3
Zoogeography: PR: BIOL 350. Principles and concepts concerning regional patterns of distribution of the animals of the world, both past and present.

ZOOL 473  Qtr. Hrs. - 4
Medical Entomology: PR: ZOOL 345. A consideration of the recognition characteristics, biology and control of insects and other arthropods of importance to the health of man, livestock and wildlife.

ZOOL 547  Qtr. Hrs. - 4
Field Zoology: PR: 12 hours in biological sciences; science teaching experience; or C.I. Classification and identification among major animal groups with emphasis on field experience. Major reference sources reviewed.
FACULTY

ABBOTT, DAVID W.
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HANRATTY, MARGARET A.
(1971), B.A., M.A., Ph.D. (Tulane University)
  Assistant Professor of Psychology
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree/Institution</th>
<th>Position/Notes</th>
</tr>
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<tbody>
<tr>
<td>Harden, Richard C.</td>
<td>(1968), B.M.E., B.E.E., M.S.E., Ph.D. (University of Florida)</td>
<td>FTU Professor of Engineering Courtesy Appointment; University of Florida Residen Director and Professor of Electrical Engineering, GENESYS - Orlando</td>
</tr>
<tr>
<td>Harrow, Thomas L.</td>
<td>(1970), B.S., M.Ed., Ph.D. (Florida State University)</td>
<td>Assistant Professor of Education</td>
</tr>
<tr>
<td>Hartman, J. Paul</td>
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</tr>
<tr>
<td>Haughee, Harold J.</td>
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</tr>
<tr>
<td>Hynam, George E.</td>
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</tr>
<tr>
<td>Heinzler, Martin N.</td>
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<tr>
<td>Henderson, Billy J.</td>
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</tr>
<tr>
<td>Hernandez, David E.</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
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<tr>
<td>Hotaling, Edward R., Jr.</td>
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<tr>
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<tr>
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# INDEX
