1968-69 COURSES/CLASSES/PROGRAMS

ORLANDO, FLORIDA/MARCH, 1968

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ACCENT ON THE INDIVIDUAL

Bulletin Supplement

Florida Technological University

1967-68 / 1968-69

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Volume 1, Number 2 **(Second Printing) October, 1968**

Orlando, Florida

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Administration Building
(Main Entrance)

UNIVERSITY CALENDAR

FALL QUARTER 1968

Aug. 30	Last day for receipt of application for admission to Fall Quarter.
Sept.13	Last day for receipt of required admissions materials (materials received after this date will require the applicant to register at one of the late registrations when accepted).
Sept.30-Oct.2	Orientation and advisement for new freshmen and transfer students not pre-advised.
Oct. 3 & 4	Registration
Oct. 7	Classes begin at 8:00 a.m.
Oct. 8	Late registration 6:30-8:00 p.m. (for late applicants and temporary students). A $10.00 late fee will be assessed.
Oct. 11	Last day to change class schedule.
Oct. 11	Last late registration–4:00-5:30 p.m. A $10.00 late fee will be assessed.
Nov. 1	Deadline for withdrawal without penalty. Last day to remove temporary student status.
*	Educational counseling and schedule advisement for Winter Quarter.
Nov. 28 & 29	Thanksgiving Holidays
Dec. 2	Classes resume at 8:00 a.m.
Dec. 3	Last day student may withdraw from a course or the University.
Dec. 17	Classes end at 9:30 p.m.
Dec. 18	Christmas Holidays begin.

WINTER QUARTER 1969

Dec. 5	Last day for receipt of application for admission to Winter Quarter.
Dec. 19	Last day for receipt of required admissions materials (materials received after this date will require the applicant to register at one of the late registrations when accepted).
Jan. 1	New Years Holiday
Jan. 2	Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.
Jan. 2 & 3	Registration
Jan. 6	Classes begin at 8:00 a.m.
Jan. 7	Late registration–6:30-8:00 p.m. (for late applicants and temporary students). A $10.00 late fee will be assessed.
Jan. 10	Last day to change class schedule.

*Date to be announced

Jan. 10	Last late registration–4:00-5:30 p.m. A $10.00 late fee will be assessed.
Jan. 31	Deadline for withdrawal without penalty. Last day to remove temporary student status.
*	Educational counseling and schedule advisement for Spring Quarter.
Feb. 28	Last day student may withdraw from a course or the University.
Mar. 14	Classes end 9:30 p.m.

SPRING QUARTER 1969

Feb. 14	Last day for receipt of application for admission to Spring Quarter.
Feb. 28	Last day for the receipt of required admissions materials (materials received after this date will require the applicant to register at one of the late registrations when accepted).
Mar. 17 & 18	Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.
Mar. 19 & 20	Registration
Mar. 21	Classes begin at 8:00 a.m.
Mar. 24	Late registration–6:30-8:00 p.m. (For late applicants and temporary students.) A $10.00 late fee will be assessed.
Mar. 27	Last day to change class schedule.
Mar. 27	Last late registration–4:00-5:30 p.m. A $10.00 late fee will be assessed.
Apr. 4	Easter Holiday
Apr. 7	Classes resume at 8:00 a.m.
Apr. 18	Deadline for withdrawal without penalty–last day to remove temporary student status.
*	Educational counseling and student advisement for the Summer and Fall Quarter.
May 16	Last day student may withdraw from a course or from the University.
May 29	Classes end at 9:30 p.m.
May 30	Holiday

SUMMER QUARTER 1969

May 2	Last day for receipt of application for admission to Summer Quarter.
May 16	Last day for receipt of required admissions materials. (Materials received after this date will require the applicant to register at one of the late registrations when accepted.)

*Date to be announced

Jun. 2 & 3	Orientation and advisement for new freshmen, transfers, and advisement for returning students not pre-advised.
Jun. 4 & 5	Registration
Jun. 6	Classes begin at 8:00 a.m.
Jun. 9	Late registration–6:30-8:00 p.m. (For late applicants and temporary students). A $10.00 late fee will be assessed.
Jun. 12	Last date to change class schedule
Jun. 12	Last late registration–4:00-5:30 p.m. A $10.00 late fee will be assessed.
Jul. 3	Deadline for withdrawal without penalty. Last day to remove temporary student status.
Jul. 4	Holiday
Jul. 7	Classes resume at 8:00 a.m.
*	Educational counseling and student advisement for the Fall Quarter.
Aug. 1	Last day student may withdraw from a course or the University.
Aug. 15	Classes end at 9:30 p.m.

*Date to be announced

SPECIAL NOTES TO PROSPECTIVE STUDENTS

Florida Technological University is the newest state-supported institution of higher education in Florida.

The University opens in September, 1968, with freshman, sophomore and junior course offerings.

The University is coeducational.

Students will be able to major in any one of the five colleges of the University. These colleges are the:

A. College of Business Administration
B. College of Education
C. College of Engineering and Technology*
D. College of Humanities and Social Sciences
E. College of Natural Sciences

*Freshmen only in 1968.

Florida Technological University welcomes requests for information from prospective students. General information may be obtained from the Office of the Registrar.

Application forms and admission information may be obtained from the Director of Admissions. On page 182 of this Bulletin is a form which may be used to request an application for admission.

Inquiries may be addressed to:

Florida Technological University
Post Office Box 25000
Orlando, Florida 32816

University Telephone: (305) 425-2694 or
275-9101 (after July 15, 1968).

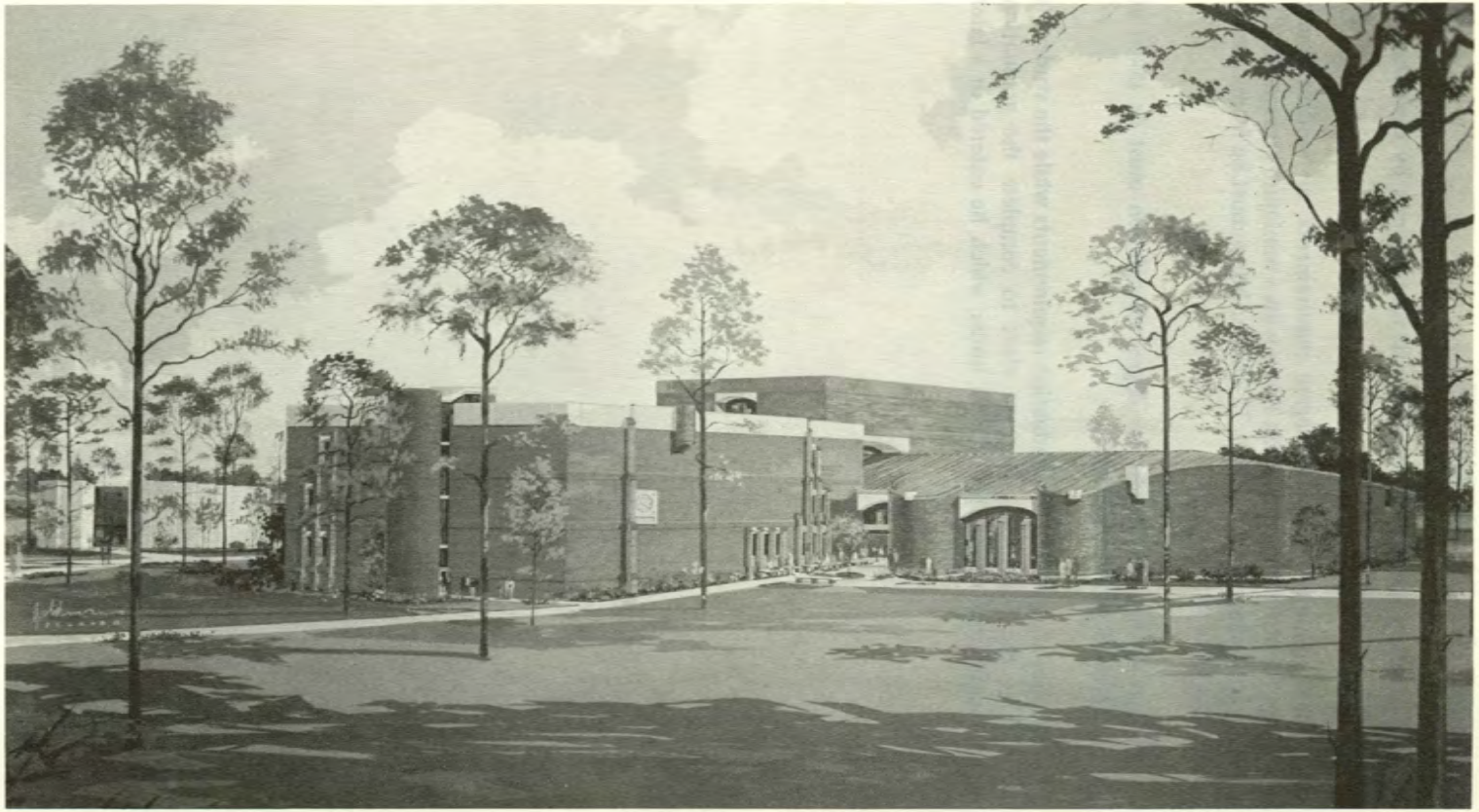
DEGREE REQUIREMENTS

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

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

The last 45 hours of credit for degree completion must be taken at Florida Technological University.

If changes are made in the graduation requirements while the student is enrolled at the University, he may elect to complete the graduation requirements from either the bulletin under which he entered or a later one.



Science and Technology Building
and Data Processing Center

STUDENT AFFAIRS

Introduction

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

Orientation

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

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 seven or more hours.

II. Unless otherwise announced, students will be permitted to live in off-campus accommodations if they are 21 years of age by 1 September of the first quarter; 1 January of the second quarter; 1

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 Student Affairs.

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

Housing and Food Services

The University recognizes the important contributions group living makes to the student's personal and educational experience. Through a carefully coordinated program, each residential unit provides an opportunity for the student to enlarge his circle of friends and become involved in effective house government where he may gain experience in self-development, respect for others, and assume responsibility for himself, his associates and the University community.

Each residential unit is air conditioned and is arranged on a suite plan to include a living room, bedroom and bath facilities, study areas, and ample closet space. Additionally, telephones, laundry facilities, and mail services are provided. Dining facilities in the nearby Village Center are available to all students.

Residential units are under the supervision of the Director of Housing, assisted by Resident Instructors and a staff of Counselors and Assistants. The Director is responsible for coordinating the residence program and management of the physical facilities. In each unit a Resident Instructor is available to assist students with programs and other activities and to counsel them individually. Qualified Resident Counselors and Resident Assistants are available to assist residents with individual and group activities, self-government programs and to encourage individuals to achieve personal goals and contribute to the welfare of their fellow students.

Each student receives, as a part of the admissions procedure, housing information and a contract application. Contracts for residence accommodations are sent after the applicant has been cleared for admission. The priority of assignment is based upon the date of receipt of the contract with the required payment. All contracts are for room and board.

Health Center Services

The University is concerned with the physical and emotional health of the student as well as the promotion of individual and general health in the University community. A health service will be maintained on an out-patient basis for routine and emergency health needs, to promote health education, and to protect the student body from communicable diseases. A physician, as well as specialists, will be available on an on-call basis and a staff of nurses will be on duty at all hours. Medical care in the student's living quarters is not provided, but plans are being made for a student health insurance program.

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

Financial Aids and Scholarships

It is the objective of the Student Financial Aids Program to enable students who are academically qualified but who lack funds to enroll in the University. While different loan fund programs are available, the National Defense Student Loan Program is usually the type of loan provided to entering freshmen. Scholarships, loans and grants are awarded students on the basis of academic potential, financial need, and the availability of funds. The Director of Financial Aids will assist eligible students in resolving their financial problems relative to educational efforts.

Financial aid programs available to qualified students include National Defense Student Loans, federally insured loans through private banks, funds provided through the Florida Student Scholarship and Loan Commission, Educational Opportunity Grants, and part-time employment through the College Work-Study Program. Factors considered in determining eligibility for the latter program are academic achievement or creative potential, financial need, work skills, and work experience.

Scholarships will be awarded to students on the basis of outstanding

academic ability and achievement. Financial need may also be considered. The primary purpose of these scholarships will be to attract outstanding students to the University and to recognize those students who have done exemplary work at the University.

Entering or transfer students should request financial assistance at the time they apply for admission to the University. For further information, students should write the Director of Financial Aid and request appropriate application forms.

Developmental Center Services

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

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

Student Government

The purpose of Student Government is to encourage effective and meaningful communication among students, faculty, and administration. It provides the participant an opportunity to serve his fellow students and to join them in activities designed to acquaint them with local, national and international affairs. Through Student Government, the student himself speaks for his associates which affords him a valuable education in the management of freedom and responsibility within the limitations of University policies. Thus Student Government is a means for an expression of the student's needs and a laboratory for his problem-solving and assumption of democratic responsibilities.

Student Activities

Student leadership may, in part, be enhanced and developed through informed, experienced, dedicated University and community participation.

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

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 will contain food service facilities, conference rooms, and lounge areas where the student may relax during his leisure moments. Offices will be available for student organizations and student governing groups. Under the administration of the Director of the Village Center, many student activity programs will be developed for the recreational and social 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. The breach or violation of any of these laws or regulations may result in judicial or disciplinary action.

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

College Expenses

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

The following estimates represent typical costs for a Florida resident attending the University full time during the 1968-69 academic year. The estimates are for one quarter of academic work and do not include personal and incidental expenses.

	Commuting Student	Student Living in University Residence Hall
Registration Fee	$125.00	$125.00
Room and Board	None	295.00
Books and Supplies	50.00	50.00
	$175.00	$470.00

Non-Florida residents will be charged an additional $200.00 per quarter for out-of-state tuition.

STUDENT COSTS

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

The following schedule applies to all Florida Technological University students:

General Fees and Costs

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

B. Registration fee (required of both Florida residents and non-Florida residents):

1. For 7 or more quarter hours (credit or non-credit), the fee per quarter will be $125.00

2. For less than 7 quarter hours (credit or non-credit), the fee per quarter hour will be ..... $ 10.00

3. Continuing Education Courses, the fee per quarter hour will be ..... $ 12.00

C. Tuition (required of non-Florida residents *in addition to the registration fee):*

1. For 7 or more quarter hours, the tuition per quarter will be $200.00

2. For less than 7 quarter hours, the tuition per quarter hour will be ..... $ 14.00

3. Continuing Education Courses, the tuition per quarter hour will be ..... $ 14.00

D. Room and Board (required of students living in University residence halls) per quarter, (estimated) $295.00

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

F. Late Registration (for students who apply for admission after the deadline) ..... $ 10.00

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

H. Vehicle Registration (required of all students, faculty and staff operating a motor-powered vehicle on-campus) per calendar year ..... $ 5.00

Special Fees

A. Add Fee (required for each student-initiated change in class schedule) per course ..... $ 1.00

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

C. Credit by Examination Fee (required of students taking special examination for credit of coursework, ... $ 5.00

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

Student Deposit Fee

At the student's first registration, every full-time student is required to pay a refundable deposit of $15.00 to avoid inconvenience to the student for small miscellaneous charges. The student will be required to maintain his deposit at a minimum of $2.00 and will not be billed during the enrollment period except when the deposit falls below this amount. If the deposit falls below the minimum before the end of attendance at the University, the student will be notified by the University Cashier to bring his deposit up to $15.00. Failure to comply will deny the student the privilege to register.

If a student changes from full- to part-time, or officially withdraws or graduates from the University, he may apply to the Cashier's Office for a refund of the deposit. All deposits will be refunded by check within 30 days after application has been made. If the student has registered on a full-time basis, the deposit will be extended for that period.

Checks

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

Refund of Fees

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

A full refund of tuition, registration and instructional fees will be made if the student's registration is cancelled before the first day of classes.

No fees will be refunded after the late registration period has ended except in the following cases:

a. A student involuntarily called back to duty with the armed forces will be entitled to a refund in the amount of the registration fee less

$30.00 for a full-time student and $3.00 per hour for a part-time student.

b. The death of a student or an incapacitating illness of such duration and severity as to preclude successful completion of the academic program for the term for which enrolled would also permit a refund in the amount of the registration fee less $30.00 for a full-time student and $3.00 per hour for a part-time student.

A full refund of music fees and out-of-state fees will be made if withdrawal is effected on or before the last day of late registration period.

No part of the student activity fee will be refunded if the student fails to surrender the certificate of registration at the time the certificate of withdrawal is presented at the Cashier's Office.

Deductions from authorized refunds will be made for unpaid accounts due the University.

WHERE TO GET HELP!

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

Admissions, registration, records and transcripts	Registrar
Academic status	Registrar
Academic adviser	Appropriate college Dean
Add, drop or change courses	Registrar, student's adviser, or Dean of college
Questions on academic standing	Adviser, or Dean of college
Special permission to seek credit by examination	Dean of the appropriate college
Check out records, books or prints	Library
Borrowing books from another University	Library
Information about attending day classes	Registrar

Withdraw from the University	Registrar
Orientation for new students	Dean of Student Affairs
Help with personal problems	Dean of Student Affairs
Pay University bills, obtain refund	Business Office
Help with reading or speech and hearing	Director of Developmental Center
Help in finding out about vocational opportunities	Director of Developmental Center
Loans, scholarships, grants	Director of Financial Aids
Cash a check	Business Office or bookstore
Part-time jobs in the University	Director of Personnel
Locate a suitable room	Director of Housing
Lost and Found	Director of Village Center
Secure a new Identification Card	Business Office
Secure a redress of a grievance	Dean of Student Affairs
Registration of vehicles	Security Office
How to organize a club	Dean of Student Affairs
Arrange a social function or activity	Dean of Student Affairs
Secure tickets for music and cultural events	Director of Village Center
Problems no one else able to answer	Dean of Student Affairs
Scores on admissions or orientation tests	Adviser
Books & School supplies	University bookstore

UNIVERSITY POLICIES

ADMISSIONS REQUIREMENTS–*First-time College & Transfer*

Freshman Applicants–First College Attended

The following classes of applicants will be eligible for consideration as candidates for admission to credit courses, subject to satisfactory receipt and review of all items requested in the admissions process:

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

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

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

Graduates Who Meet Requirements in the First Two Categories Above, but Have Graduated from an Unaccredited *High School* may enter on provisional admission. By obtaining 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.

Graduates Who Score Below 300 on the Florida State-wide Twelfth Grade Test and have a satisfactory high school performance will be considered, assuming other outlined requirements have been met.

Transfer Applicants

Students transferring to degree programs must have a minimum 2.0 GPA on all college work previously attempted and must be eligible to return to their *last* previously-attended institution. Should the applicant have less than 90 quarter hours of transferable college credit, and not possess a University parallel degree from a Florida approved junior college, he must also meet the University's freshman entrance requirements.

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

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

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

Service school courses completed will be evaluated with reference to the recommendation of the American Council on Education when official credentials have been properly presented. Credit may be extended when courses are equivalent to those offered by the University. Recommendation by the A.C.E. is not binding upon the University, and application for such credit should be made at the time of admission.

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

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

1. *State Junior College and University Transfers* may satisfy the Basic Environmental Studies Program requirements by completing, prior to transfer, the general education program prescribed by the junior college. This also applies to transfers from state-operated universities. Graduation with an overall 2.0 GPA in a university parallel program from such a state junior college greatly enhances admission and is therefore recommended. Such graduates are not required to take additional Physical Education.

2. *Private Colleges and Out-of-State Institutions.* The general education programs of transfer applicants from private junior and senior colleges and out-of-state institutions will be evaluated on an individual basis.

3. *Unaccredited Colleges or Universities.* Transfer applicants who otherwise meet all requirements, but who are entering from unaccredited colleges, may enter on provisional admission. By earning a 2.0 GPA or better at the end of the quarter during which

12 or more quarter hours are attempted, the provisional status shall be removed and any credit to be transferred may be validated.

ADMISSIONS–*Provisional*

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

APPLICATION DEADLINE

Applications for Degree Credit should be received thirty (30) days prior to the first day of classes for the quarter in which the student wishes to enroll. Applicants whose application has not cleared because of failure to receive supporting documents may, under certain conditions, 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 $10.00.[1]

RECORDS DEADLINE–*All Support Documents*

All records requested must be received not later than fifteen days preceding the first day of classes, or otherwise the applicant shall be required to register on a temporary basis at a late registration period and pay a Late Registration Fee of $10.00. Records of temporary students must be officially received within four weeks (twenty class days) from the first day of classes, or the student will be changed to an audit (non-credit) status and no fees will be refunded.

RECORDS–*Validity of Support Documents*

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

READMISSION–*After Voluntary Withdrawal*

Former students who were not in attendance during the previous academic quarter (exclusive of the summer term) or who withdrew from the University before the end of the previous 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

[1]See Records Deadline–All Support Documents, above.
Also, see Fees (Late and Course Change), page 30.

later than 30 days before the beginning of the quarter of expected attendance.

Any former student who withdrew with a Cumulative or Overall Grade Point Average of less than 2.0 (C) and is considered readmissible will be admitted on academic probation.

TEMPORARY STUDENT—*Change to Non-Credit Policy*

Any student permitted to register and to attend classes whose admissions file is incomplete is granted a maximum of four weeks of classes (twenty class days) to complete satisfactory admissions records, or be changed to Audit (non-credit) status. No fees will be refunded in such cases, and it is the student's responsibility to see that records are received by the Director of Admissions!

TRANSIENTS

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

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

AUDITORS

University Students. Any Degree Credit Student may be admitted to a class as an Auditor with the approval of the chairman of the department in which the course is offered; however, no credit by examination may be earned on work audited. For Degree Credit Students a course may be changed from Audit to Credit only during the Add-Drop Period and then only with his faculty adviser's consent.[2] Auditors will not receive University credit, nor is the instructor obligated to administer any tests.

[2]See Application Deadline, page 25.
Also, see Records Deadline, page 25.

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

Non-University Students. Any person not enrolled in the University may be admitted to classes as an Auditor if the desired class is not already filled with properly-admitted students, with the approval of the chairman of the department in which the desired course is offered. 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 Audit Students. Those admitted shall pay the same fees per quarter hour as the Degree Credit Students, 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 with the instructor who will teach the course. A short application form will be completed at the time of registration and payment of fees. The instructor will turn in all enrollment records to the appropriate office on the next day of business. Receipts will be mailed to the registrants, and no registration will be accepted after the second class meeting. 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 not be closed until the end of the second class meeting, after which the instructor will not be allowed to accept any registration or fees.

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

Add & Drop will extend through the end of the second class meeting.

CONCURRENT ENROLLMENT

Concurrent enrollment in another institution is permitted only when approval to be a transient student has been obtained.[3]

[3]See Transients (FTU Students), page 26.

NON-DEGREE STUDENTS–*On-Campus*

Non-degree students (twenty-one 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 twenty-one years of age wishing to enter as non-degree students must meet the same admissions requirements as degree-seeking students.

Only students furnishing complete portfolios may register for as many as twelve (12) quarter hours.

Non-degree-seeking students wishing to change their status and work toward a degree must meet the admissions requirements of such students or earn a minimum of twenty-four (24) quarter hours with a minimum 2.0 GPA on all college work attempted.

The non-degree mature student is not required to take Physical Education.

HEALTH AND CITIZENSHIP

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

FLORIDA RESIDENCE

For the purpose of assessing tuition, applicants are classified as Florida or non-Florida students. In applying this regulation, "applicant" shall mean a student applying for admission to Florida Technological University if he is 21 years of age or over. When he is a minor, it shall mean his parents, parent or guardian of his or her person. Such applicant will pay the non-Florida tuition and other charges required of non-Florida students unless he shall be a citizen of the United States and shall have resided and had his habitation, domicile, home and permanent abode in the State of Florida for at least 12 months immediately preceding his registration; provided, however, that the applicant cannot claim continuous residence in Florida by virtue of enrollment in any college or university in the State of Florida for the required period.

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

A minor applicant whose father is a member of the military establishment and claims residency should outline the period of time that

his father has resided in Florida, whether his father entered service from Florida, whether or not his home of record on his military records is Florida and other information that would assist in determining residency.

ORIENTATION AND ADVISEMENT

After the applicant has been advised of his admission, he will be notified of his priority and time for registration. However, prior to the registration, he will be required to attend a University orientation program to be followed by a conference with the adviser to whom the new student is assigned. Adviser assignments are based upon the major area indicated by the student in his application, and he will be notified to help the new student plan his program of study for future quarters.

CREDIT BY EXAMINATION

Students of superior ability and preparation, and students who have already gained a fundamental knowledge of subjects offered at the University may be permitted to take credit by examination in courses specified by the Dean of their College, provided, of course, such credit has not been previously used to satisfy high school graduation, and if passed with satisfactory grades, will enable a student to receive degree credit.

Permission to utilize such examinations is granted by the Dean of the college in which the course is offered, and he will establish the condition for the examination. Permission may be given, subject to the following conditions:

1. Credit by examination is limited to forty-five (45) quarter hours. This credit may not be used to reduce the University's minimum residence requirements. It may not be in addition to correspondence, extension, and/or service school credit, if any.

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

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

4. If a grade of "D" or higher is earned on the examination, the appropriate grade received in the course will be entered with its corresponding grade points. If a grade lower than "D" is earned,

only the fact that the examination has been attempted will be recorded. The student may attempt to earn credit by examination in the same course only once.

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

ADVANCED PLACEMENT PROGRAM

Florida Technological University will participate in the advanced placement program conducted by the College Entrance Examination Board, which provides 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 freshmen 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.

GENERAL REGULATIONS FOR ALL UNDERGRADUATE DEGREE STUDENTS

The last 90 quarter hours of work taken for a Bachelor's Degree must be earned in a senior institution.

A minimum of 72 quarter hours of work taken for a Bachelor's Degree must be taken in 300-level courses or above.

A minimum of 45 quarter hours must be earned in residence at FTU, and the degree candidate must be enrolled during the quarter at the completion of which degree requirements are met.

No more than 45 quarter hours of extension, correspondence, Armed Forces credit, and credit by examination are applicable toward a degree.

QUARTER HOURS EXPLAINED

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

FEES–*Late and Course Change*

Applicants who file credentials after the deadline are required to register late and pay a Late Registration Fee of $10.00. Students who

initiate class schedule changes during the five-day Add-Drop Period shall pay $1.00 for each course added. Should the changes be initiated by the administration, no fee shall be charged.[4]

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
S – Credit	0 grade point
W – Withdrawal (no penalty)	0 grade point
X – Audit	0 grade point
I – Incomplete	0 grade point

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

SCHEDULE CHANGES–*Add-Drop Policy*

Add: Students may add a course during the official Add-Drop Period (the first five class days of each quarter). After the first five class days, no course may be added. Approval of the student's faculty adviser is necessary before any course change. (For Continuing Education courses "Add's" will be accepted up to and including the second class meeting.) A $1.00 fee will be charged for each course added when the change is initiated by the student. When the change is initiated by the University, no fee shall be charged.[5]

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

[4]See Application Deadline, page 25, Records Deadline, page 25, Schedule Changes (Add-Drop Policy), above.

[5]See Fees (Late and Course Change), page 30 .

STUDENT LOAD–*Maximum*

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

ACADEMIC STANDING

It is of major concern to the University that each student should make reasonable progress toward his educational goal. A guidance and counseling service is provided to aid the student at all times, but special consideration is given when student advancement is impeded. Every effort will be made to aid him in the resumption of satisfactory progress. On occasions, students may be required to leave the University until sufficient maturity and motivation are manifested.

Acceptable academic standing at the University is reserved for those students who achieve and retain a GPA of 2.0 or higher.[6] A student remains in Good Standing academically as long as he makes normal academic progress required for graduation as described above. Failure to do so would suggest that he must alter his study habits.

STUDENT CLASSIFICATION

Students will be classified on the basis of quarter hours satisfactorily earned, as follows:

FRESHMAN:	through 44 quarter hours.
SOPHOMORE:	45 – 89 quarter hours.
JUNIOR:	90 – 134 quarter hours.
SENIOR:	135 or more quarter hours prior to completion of Baccalaureate requirements.
GRADUATE:	Any student enrolled in Graduate-level courses who has a Baccalaureate Degree.
FULL-TIME:	For fee purposes, a student who is registered for 7 or more quarter hours; for Selective Service purposes, a student who is enrolled for 12 or more quarter hours; for Veteran's Benefits, a student who is enrolled for 14 or more quarter hours.
PART-TIME:	For fee purposes, a student who is registered for six or less quarter hours; for Selective Service purposes, a student who is enrolled for 11 or less

[6]See Grading System, page 31 .

quarter hours; for Veteran's Benefits, a student who is enrolled for 13 or less quarter hours.

UNCLASSIFIED: Students earning credit, but not working on a degree program.

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

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

TRANSIENT: A student registered at Florida Technological University who is attending on approval of another college or university. FTU transient students in attendance at other institutions are not reported.

ACADEMIC STANDARDS FOR LEADERSHIP

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

INCOMPLETE GRADE

A grade of "I" (Incomplete) is assigned by the instructor when a student is unable to complete a course because of extenuating circumstances. The responsibility for making the necessary arrangements with the instructor for the removal of an "I" grade within the next successive quarter in which the student is enrolled lies with the student concerned. If the instructor from whom the course was taken is not available, arrangements must be made with the chairman of the department responsible for the course. Should a student register for a course which already appears on his permanent record with a grade of "I," the "I" shall immediately become an "F".

ACADEMIC PROBATION, DISQUALIFICATION, AND EXCLUSION POLICY

Academic probation is intended to inform the student who is making unsatisfactory progress of his need to alter study habits and seek additional counseling. Early recognition should inform the student and his parents of the possible jeopardy to his ultimate goals and allow him every opportunity to demonstrate acceptable performance.

A First-Time Entering Freshman student who fails to produce a 2.0 (C)

grade point average (GPA)[7] at the end of his first quarter of attendance will be placed on academic probation. Should such a student have been admitted on academic probation, academic disqualification for a minimum period of one quarter would result.

A Transfer Student admitted on academic probation will not have the probation removed until such time as his Overall* GPA is 2.0. Should such a transfer student fail to earn a 2.0 GPA on work attempted during his first quarter or maintain a 2.0 Cumulative* GPA thereafter while on probation, academic disqualification for a minimum period of one quarter would result. Transfer students who remove their probation will have said probation reinstated should their Cumulative* or Overall* GPA fall below 2.0.

A Currently Enrolled Non-Transfer Student, of More Than One Quarter, who fails to maintain a 2.0 Cumulative* GPA will be placed on academic probation. Should such a student earn a 2.0 GPA on all work attempted after being placed on academic probation, he will remain on academic probation until such time as his Cumulative* GPA is 2.0, and at such time will be removed from probation. Failure to earn a 2.0 GPA for the next quarter would result in academic disqualification for a minimum period of one quarter.

A Readmitted Student. Any student readmitted by the University Admissions and Standards Committee following academic disqualification must either earn a 2.0 quarter* GPA or a 2.0 Cumulative* GPA in order to avoid academic exclusion.

Each quarter the work of every student will be reviewed and appropriate action taken as his academic record warrants.

Academic disqualification and exclusion involves involuntary separation of the student from the University, and the latter establishes or implies no time limit.

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

[7]See Grading System, page 31.

WITHDRAWAL POLICY–*From a Course (After Add-Drop Period) or From the University*

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

A "W" grade will be entered for any student who withdraws prior to the end of the fourth week of classes. A "W" will be entered for any 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.

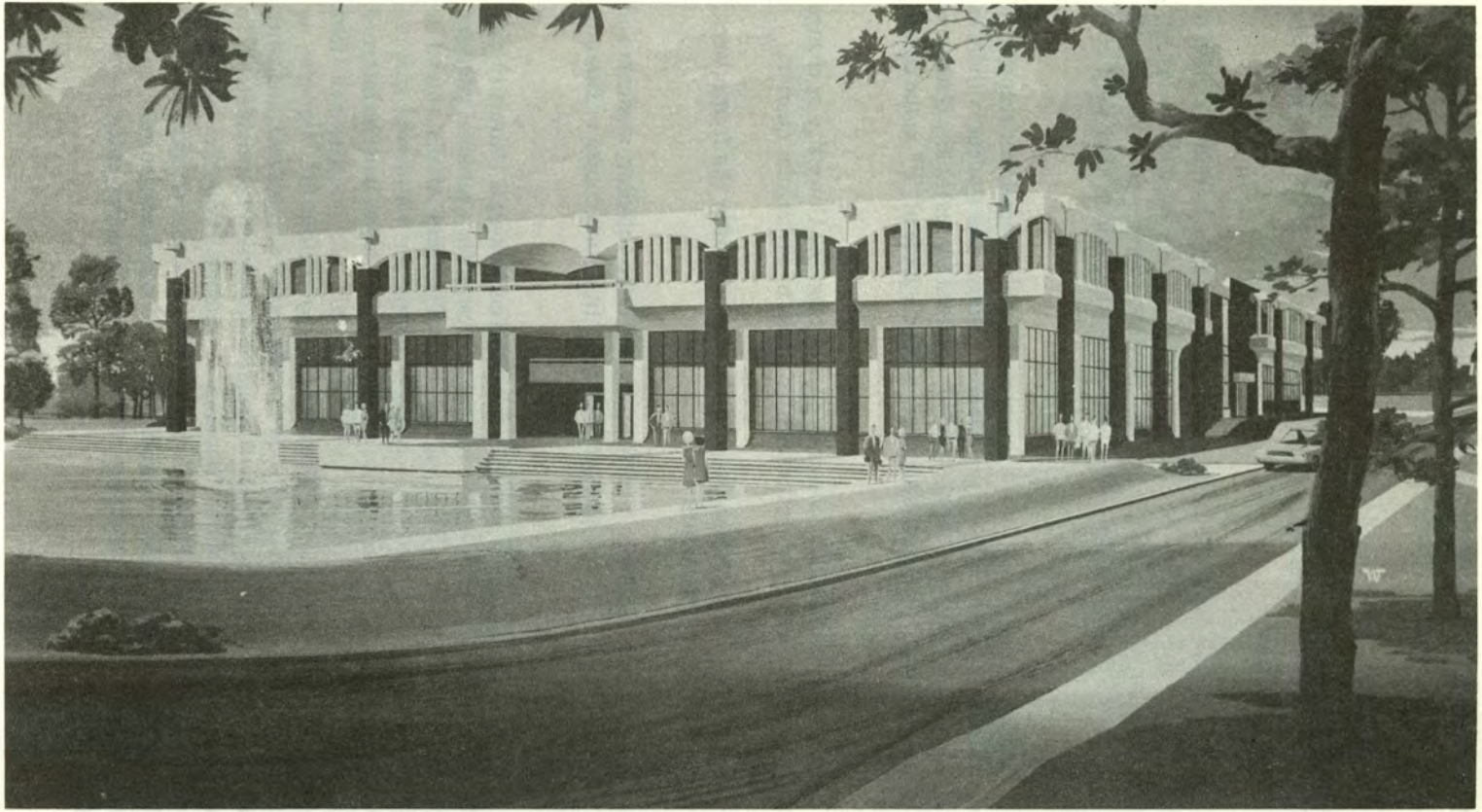
If an "F" is entered, it will be posted on the permanent record and calculated as an "F" in the grade point average. If a student withdraws from a class or from the college without approval (drops) at any time prior to the reporting of final grades, he will receive a grade of "F" in the course or courses dropped.

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

No Student may change from Credit to Audit after the fourth week, unless he is passing the course.

These policies apply to part-time, as well as to full-time, students and are effective whether the student withdraws from one course or from the University.

In order that student's record at Florida Technological University may be complete at all times, he is required to arrange for a terminal interview with the Dean of his College and the Dean of Student Affairs, should he leave the University during a quarter. Forms for withdrawal may be obtained at the Registrar's Office and, when completed, must be returned to the Registrar. If not, the withdrawal will not be processed. (See paragraph one, Withdrawal Policy.) During or before the interview, an application for *Withdrawal in Good Standing* will be completed, and when it is signed by the appropriately-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 his 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 his permanent record.



Administration Building
(Campus Entrance)

ACADEMIC PROGRAMS

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

ENVIRONMENTAL STUDIES PROGRAM

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

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

ENVIRONMENTAL STUDIES (69)

Basic Program* (55)

Communications 9

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

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

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

Humanities 9

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

Physical Education 3

Physical Education (1, 1, 1)
   Environmental Studies–Physical Education (ESPE) is satisfied by completing one course from each of the following areas: individual activities, team activities, dual activities.

***Satisfactory completion of a junior college general education program fulfills the requirements of the Environmental Studies Basic Program.**

Scientific Environment 16

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 offered by the Departments of Biological Sciences, Chemistry, and Physics may be used in the Environmental Studies Program. ENGR 151 also may be included.

Social Environment 18

I. Social Sciences

Economics

ECON 201, 202 (3, 3)

Geography

History

Any course in History

Political Science

Any course in Political Science

II. Behavioral Science

Anthropology

SOC 221, 222 (3, 3)

Psychology

PSY 201, 202 (3, 3)

Sociology

SOC 201, 202 (3, 3)

III. Foreign Language

Nine hours in one of French, German, Russian, or Spanish

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

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

Advanced Program (14) (Required of all students)

Business and Technological Environment 6

I. Business (3)

BADM 301 Business Concepts (3)

II. Technology (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)

Senior Seminars 8

Each student will take four of the five seminars, omitting the one offered by the College in which he is majoring.

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

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

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

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

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

TOTAL 69

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.

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

Environmental Studies Program (69)

The student in the College of Business Administration is required to satisfy the Environmental Studies Program and include MATH 105 or MATH 121 in the mathematical science sequence.

Each student must include nine hours of history, political science, and/or economic history in his academic program.

The student selecting a major in management or marketing is advised to select psychology in the behavioral science sequence of the Environmental Studies Program since an advanced course in psychology appears as a major course requirement.

Business Core (56)

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.

BADM	101	Business	4
ACCY	101, 102, 103	Principles of Accountancy	9
ECON	201, 202, 203	Principles of Economics	9
ENG	301	Professional Report Writing	3
FIN	301	Finance	5
MGMT	301	Management	5
MKTG	301	Marketing	5
ECON	321	Business and Economic Statistics	4
BADM	371	Business Law	3
ECON	401	Managerial Economics	5
BADM	495	Business Policies	5

Major (25-33)

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

Beginning In 1968-1969	Beginning In 1969-1970
Accountancy	Business Administration
Economics	Finance
Management	Marketing
	Transportation

Elective (25-33)

1. A student is expected to enroll in courses at a level commensurate with his class standing.
2. A minimum of 15 elective credit hours must be earned outside the College of Business Administration.
3. Not less than one-half of elective credit counted toward a degree must be earned in 3 and 400 level courses.

TOTAL (183)

MAJOR COURSE REQUIREMENTS

ACCOUNTANCY

Accountancy is usually selected as a major by the student who is preparing for private, governmental, or public accounting, or who wishes to use accountancy as general training for a career in business.

In private accounting, the accountant's employment is limited to a single organization. The size and nature of the organization determines the scope of the accounting activities but, broadly defined, the following duties are illustrative: design and installation of accounting systems, preparation of financial statements and reports, cost accounting, internal auditing, interpretation and analysis of budgets, and preparation of tax returns.

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

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

Course requirements for a major in Accountancy are:

A. Required:

ACCY 311 Intermediate Accounting (3)
ACCY 312 Intermediate Accounting (3)
ACCY 313 Advanced Accounting (3)
ACCY 321 Cost Accounting (3)
ACCY 331 Auditing (3)
ACCY 341 Governmental Accounting (3)
ACCY 351 Federal Income Tax Accounting (3)
ACCY 361 Computer Applications to Accounting Problems (3)
ACCY 491 Problem Analysis (3)

B. Elective: (Two courses)

ACCY 322 Cost Accounting (3)
ACCY 334 Audit Report Writing (3)
ACCY 342 Municipal Accounting (3)
ACCY 352 Federal Income Tax Accounting (3)

The student who wishes to sit for the Certified Public Accountant's Examination without entering the Professional Program in Accountancy is advised to include in his academic program a minimum of 13 hours of English (composition, literature, report writing, etc.) and 27 hours of economic theory and principles, business law, business and/or public finance (corporation finance, investments, money and banking, governmental finance or business finance). The student who selects the one-year work-experience option should read Section 473.08, Florida Statutes, State Board of Accountancy.

Professional Program in Accountancy

Under certain conditions the State Board of Accountancy, State of Florida, will permit a student to sit for the Certified Public Accountant's Examination by substituting a fifth year in college for one year of required accounting experience. The following minimum qualifications must be fulfilled:

(a) The full year's work will consist of not less than 36 quarter hours of college or university study or its qualitative equivalent.
(b) At least 22 of the 36 hours shall be in accounting subjects.
(c) It is required that 18 of the 22 hours of advanced accounting subjects shall be selected from at least three of the following areas:

(1) Cost Accounting
(2) Federal Taxation Accounting
(3) Auditing Theory and Practice
(4) Governmental Accounting
(5) Accounting Theory

(d) The additional 13 hours shall be in courses, other than accounting, which are regularly offered in the College or School of Business Administration of the respective accredited college or university.

(e) Such courses to be "on the advanced level" must be advanced courses over and above requirements for a Bachelor Degree.

(f) The final grade in each advanced course must be not less than "B," or equivalent in the standards used for advanced work at the college or university in which the work is being done.

(g) The fifth year of study may be taken only after receipt of a four-year Bachelor Degree with a major in accounting.

The student who has earned a bachelor's degree with a major in accountancy from Florida Technological University may make application for the Certified Public Accountant's Examination upon completion of the Professional Program in Accountancy.

A. Required:

ACCY 423 Cost Accounting (3)
ACCY 432 Auditing (3)
ACCY 443 Problems of Funds Control (3)
ACCY 453 Federal Income Tax Accounting (3)
ACCY 492 Professional Accounting Problems (3)

and choice of:
ACCY 464 Interpretation of Accounting Data (3)
ACCY 493 Professional Practice (3)

B. Accountancy Electives:
(Two courses not counted toward the bachelor's degree)

ACCY 322 Cost Accounting (3)
ACCY 334 Audit Report Writing (3)
ACCY 342 Municipal Accounting (3)
ACCY 352 Federal Income Tax Accounting (3)

C. Business Administration Electives: (14)

Advanced level courses in business administration other than courses in accountancy.

The student who completes the Professional Program in Accountancy is required to have earned a minimum of 63 credit hours in accountancy and 53 credit hours in related subjects. If the student earns both a bachelor's degree with a major in accountancy, and completes the Professional Program in Accountancy at Florida Technological University, he will have fulfilled the minimum requirements for the Certified Public Accountant's Examination.

BUSINESS ADMINISTRATION

Increasingly, sophisticated tools of quantitative analysis are being used in the business world. The business administration option provides an

opportunity for the quantitatively able student to utilize his ability in the solution of business and economic problems through the use of quantitative tools. For those students interested in the small business option, an appropriate program will be available.

Although the focus of this curriculum is on the solution of business and economic problems, a good foundation in mathematics and statistics is of particular value to the student selecting this major. There is a wide range of opportunities in business and industry, government, research, and education awaiting the student completing his major in business administration.

Course requirements for a major in Business Administration are:

A. Required:

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

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

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

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

ECONOMICS

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

One of the major goals of economics is the preparation of a student for intelligent citizenship. The economics courses required of all students in the College of Business Administration are designed to provide a sound

grasp of tools of analysis and measurement, as well as the ability to apply systematic analysis to problems of business policy. A major in economics prepares the student for careers in a variety of areas, including business, industry, and government.

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

The student majoring in economics may earn either the Bachelor of Arts degree in the College of Humanities and Social Sciences or the Bachelor of Science degree in the College of Business Administration. The difference in these two degree programs occurs in the Business Core. For the Bachelor of Science degree, the student must complete the Business Core. For the Bachelor of Arts degree, the student must take ECON 201, 202, 203, 321, and ENG 301 from the Business Core; ACCY 307; and thirty-five hours from the behavioral sciences, mathematics, and the social sciences. The Bachelor of Arts program is designed to permit greater flexibility in course selection to the economics major not planning a career in business.

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

I. GENERAL ECONOMICS

A. Required:

ECON 301 Intermediate Price Theory (5)
ECON 311 Intermediate Money, Income and Employment Theory (5)

B. Elective:

(Six courses in economics not used elsewhere)

II. QUANTITATIVE ECONOMICS

A. Required:

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

B. Elective:

(Three courses in economics not used elsewhere)

FINANCE

The program in finance is designed to provide the student with a broad knowledge in the areas of business and corporation finance and investments. Business and corporation finance is concerned largely with the

institutions and instruments through which short-term and long-term capital may be obtained and the management of funds in the individual firm.

The area of investments includes an analysis of the different types of outlets for investment funds, such as stocks and bonds, and an examination of the various factors involved in investment decisions and portfolio management. The program in finance provides the student with the theoretical background and the tools of analysis required for making effective judgments in finance.

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 (3)
FIN 331 Money and Banking (5)
FIN 411 Financial Institutions (3)
FIN 431 Financial Management (3)

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

1. ECON 311 Intermediate Money, Income and Employment Theory (5)
   FIN 311 Risk and Insurance (5)
   FIN 421 Security Analysis (5)

2. BADM 484 Operations Research (3)
   ECON 341 International Economics (3)
   ECON 431 Public Finance (3)

MANAGEMENT

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

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

The production manager is concerned with the efficient utilization of the organization's material resources. The design and improvement of productive capacity and the coordination of the production process with other system activities are primary concerns.

A student majoring in management may find a wide variety of career opportunities in business, industry, or government.

A. Required:

PSY	308	Social Psychology (4)
MGMT	324	Production Management (5)
MGMT	344	Organization Theory (5)
MGMT	364	Personnel Management (5)
BADM	484	Operations Research (3)

B. Elective: (Two Courses)

ACCY	321	Cost Accounting (3)
ECON	331	Economics of Labor (3)
MGMT	347	Human Relations in Management (3)
MGMT	367	Industrial Relations (3)
COMP	487	Computer Processing of Business Data (3)

MARKETING

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

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

Course requirements for a major in Marketing are:

A. Required:

PSY	308	Social Psychology (4)
MKTG	364	Advertising Management (3)
MKTG	367	Sales Management (3)
MKTG	384	Marketing Research (5)
MKTG	495	Marketing Policies and Strategies (3)

B. Elective: (One course from each group)

1.	MKTG	324	Marketing Environment (5)
	MKTG	326	Consumer Market Behavior (5)
2.	MKTG	334	Pricing Policies (3)
	MKTG	344	Marketing Logistics (3)
3.	BADM	444	International Business Operations (3)
	MKTG	469	Advertising and Sales Management (3)

TRANSPORTATION

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

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

Course requirements for a major in Transportation are:

A. Required:

ECON	301	Intermediate Price Theory (5)
ECON	381	Economics of Public Utilities (3)
TRAN	301	Principles of Transportation (5)
TRAN	401	Transportation Pricing and Policy (3)
TRAN	411	Transportation Planning (3)

B. Electives: (Two Courses)

BADM	444	International Business Operations (3)
ECON	481	Economics of Urban Areas (3)
MKTG	344	Marketing Logistics (3)
SOC	321	Urban Sociology (3)

COLLEGE OF EDUCATION

The Career Teaching Program is an interrelated series of courses organized to blend theory and practice. Course work is structured on the basis of those special skills, knowledges, and attitudes a teacher must possess to effectively change pupil behavior. The student is provided with a wide variety of practical experiences in scheduled public school laboratory activities, observations, and simulated situations.

Bachelor of Arts Degree Program

The Career Teacher Programs are designed to lead to the Bachelor of Arts degree. Students are encouraged to enroll in the College of Education as early as the freshman year. 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	Quarter Hours
1. Environmental Studies Program Basic (55) Advanced (14)	69
2. Academic Specialization	37-65
3. Professional Preparation Phase I, Teaching Analysis and Human Development Phase II, Developmental–Elementary Developmental–Secondary Phase III, Teaching Strategies Student Teaching	35-38
4. Electives (11-42)	(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, and with recommendation of the Dean of the College, a graduate may be issued a Rank III Florida Teaching Certificate by the Florida State Department of Education. Recommendation for issuance of the certificate is based upon the

applicant's academic proficiency, successful performance in laboratory settings, commitment to teaching, physical and emotional health, and personal characteristics. A student with a letter grade of "D" in student teaching will be eligible for graduation, but will not be recommended for a teaching certificate.

UNDERGRADUATE CAREER TEACHER PROGRAM

The Career Teacher Program consists of three distinct Phases:

Phase I—Teaching Analysis

This phase is 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 be enrolled in the College of Education, have an overall 2.0 academic average, and have successfully completed Phase I requirements.

Phase III—Application

In Phase III the student applies the fundamentals of teaching and academic knowledge attained in Phases I and II. Under the supervision of a selected teacher, the student is responsible for developing and executing plans. A full quarter is devoted to student teaching. Concurrent enrollment in the seminar, Teaching Strategies, is required. To be admitted to Phase III, a student must have: satisfied the requirements for Phases I and II; a 2.25 average in his area of academic specialization; a 2.25 average in professional education; a 2.0 overall average and be accepted by the office of the Professional Laboratory Program. An application for Phase III, Student Teaching and Teaching Strategies, must be submitted during the first two weeks of the quarter prior to the student teaching quarter.

ELEMENTARY EDUCATION

The Elementary Education Programs are planned for students interested in the development and education of children twelve years of age and younger. Students majoring in elementary education are certified to teach grades one through six upon graduation and receipt of a state teacher's certificate. Areas of study required are: (1) Environmental Studies (69 quarter hours); (2) Academic Specialization (42 quarter hours); (3) Professional Preparation (35 quarter hours); (4) Related Field of Academic Concentration (12-30 quarter hours); and (5) Electives (7-22 quarter hours).

Required Academic Specialization Courses		Quarter Hours
EDEL 301	Mathematics Programs in the Elementary School	3
EDEL 302	Teaching Mathematics in the Elementary School	3
EDEL 305	Language Arts in the Elementary School	3
EDEL 306	Music in the Elementary School	3
EDEL 307	Literature for Children	3
EDEL 312	Reading in the Elementary School	3
EDEL 315	Science Programs in the Elementary School	3
EDEL 317	Social Science Programs in the Elementary School	3
EDEL 405	Problems in the Teaching of Elementary School Language Arts	3
EDEL 406	Art in the Elementary School	3
EDEL 407	Diagnosis and Treatment of Reading Difficulties	3
EDEL 408	Teaching Science in the Elementary School	3
EDEL 409	Teaching Social Sciences in the Elementary School	3
EDEL 415	Teaching Elementary School Health and Physical Education	3
	Total	42

Required Professional Preparation Courses		Quarter Hours
Phase I—Analysis		
EDTA 205	Teaching Analysis	5
EDTA 206	Human Development	3
Phase II—Developmental		
EDEL 311	Basic Foundations of Reading	3
EDEL 316	Elementary School Curriculum	3
EDTA 305	Principles of Evaluation	3
EDTA 306	Learning Theory	3
Phase III—Application		
EDPL 407	Student Teaching	12
EDPL 408	Teaching Strategies	3
	Total	35

Related Field of Academic Concentration

A related field of academic concentration consisting of 12 to 30 quarter hours is required in one of the following areas: art, communications, early

childhood education, English, French, humanities, library science, mathematics, music, physical education, sciences, social sciences, or Spanish.

Early Childhood Education
(Nursery and Kindergarten)

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

	Quarter Hours
EDEL 401 Programs in Early Childhood Education	3
EDEL 402 Developmental Processes in Early Childhood	3
EDEL 403 Language and Cognition of Young Children	3
EDEL 404 Organization of Instruction in Nursery–Kindergarten Education	3
Total	12

Professional Laboratory Experience

Majors in elementary education will be provided practical laboratory experiences in Teacher Education Centers during two quarters of the junior year. A prescribed sequence of courses will be scheduled concurrently.

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

SECONDARY EDUCATION

The Secondary Education Programs are designed for students interested in the development and education of adolescents. Students majoring in secondary education are certified to teach an academic subject(s) in grades seven through twelve upon graduation and receipt of a state teacher's certificate. However, physical education majors are certified to teach grades one through twelve. Areas of study required are: (1) Environmental Studies (69 quarter hours); (2) Professional Preparation (38 quarter hours); (3) Academic Specialization (37-65 quarter hours); and (4) Electives which vary according to major.

Required Professional Preparation Courses	Quarter Hours
Phase I–Analysis	
EDTA 205 Teaching Analysis	5
EDTA 206 Human Development	3
Phase II–Developmental	
EDSE 304 Instructional Techniques	3

EDSE 305 Secondary School Curriculum	3
EDSE 306-309, 405-408 Instructional Analysis	3
EDTA 305 Principles of Evaluation	3
EDTA 306 Learning Theory	3
Phase III—Application	
EDPL 407 Student Teaching	12
EDPL 408 Teaching Strategies	3
Total	38

Professional Laboratory Experience

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

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

Academic Specializations

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

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

*Available for entering freshmen only, September, 1968.

Biology Specialization

Required Courses			**(47-51 Quarter Hours)**
BIOL	100, 101	General Biology (3,1)	4
BIOL	200	Genetics	4
BIOL	491 or		
EDSE	491	Contemporary Biology	3
BOT	100, 101	General Botany (3, 1)	4
CHEM	111, 112, 113	General Chemistry (4, 3, 3)	10
CHEM	114, 115	General Chemistry Laboratory (1, 1)	2
MICR	100, 101	General Microbiology (3, 1)	4
ZOOL	100, 101	General Zoology (3, 1)	4
Select One Course			
BOT	300	Plant Taxonomy (4)	
ZOOL	200	Invertebrate Zoology (4)	
ZOOL	230	Taxonomy of the Vertebrates (4)	

ZOOL	240	General Etomology (4)	4
Select One Course			
BOT	350	Plant Ecology (4)	
ZOOL	350	Animal Ecology (4)	4
Select Two Courses			
BIOL	410	Principles of Adaptation (3)	
BIOL	420	History of Biology (2)	
BOT	330	Plant Physiology (3)	
MICR	320	Advanced General Microbiology (4)	
MICR	330	Microbiology of Water and Sewage (4)	
ZOOL	400	Advanced Animal Biology (2)	4-8

Certification in General Science may also be attained by completing one course from the following areas in addition to the requirements in biology specialization: astronomy, geology, meteorology, physical geography, or earth science.

Business Education Specializations

Comprehensive Curriculum

Required Courses			(51 Quarter Hours)
ACCY	101, 102, 103	Basic Concepts (3, 3, 3)	9
BADM	371	Business Law	3
*ECON	203	Principles of Economics	3
**EDBE	101	Introductory Typewriting (3)	3
**EDBE	102, 103	Communications Production I, II (3, 3)	3-6
**EDBE	201, 202, 203	Principles of Shorthand I, II, III (3, 3, 3)	0-9
EDBE	301	Shorthand Dictation	3
EDBE	302	Shorthand Transcription	3
EDBE	305	Office Technology	3
EDBE	405	Principles of Business–Vocational Education	3
EDBE	406	Office Systems and Procedures	3
ENG	301	Professional Report Writing	3

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

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

Basic Business and Accounting Curriculum*

Required Courses			(52 Quarter Hours)
ACCY	101, 102, 103	Basic Concepts (3, 3, 3)	9
ACCY	311, 312	Intermediate Accounting (3, 3)	6
BADM	371	Business Law	3
**ECON	203	Principles of Economics	3
ECON	411	Comparative Economic Systems	3
***EDBE	101	Introductory Typewriting (3)	3
***EDBE	102, 103	Communications Production I, II (3, 3)	3-6

EDBE	305	Office Technology	3
EDBE	405	Principles of Business–Vocational Education	3
ENG	301	Professional Report Writing	3
MGMT	301	Management	5
MKTG	301	Marketing	5

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

Chemistry Specialization

Chemistry Requirements			**(52-57 Quarter Hours)**
CHEM	121, 122, 123	Organic Chemistry (3, 3, 3)	9
CHEM	124, 125	Organic Laboratory Techniques (2, 2)	4
CHEM	221, 222, 223	Chemistry Fundamentals (3, 3, 3)	9
CHEM	321, 322, 323, 324	Analytical Laboratory Techniques (3, 3, 3, 3)	12
CHEM	491 or		
EDSE	492	Contemporary Chemistry	3
Mathematics Requirements			
*MATH	103	Elementary Functions	5
MATH	121, 122, 123	Calculus with Analytical Geometry (5, 5, 5)	15

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

*May be exempted.

English Specialization

Required Courses			**(51 Quarter Hours)**
Composition			
ENG	101*,102*,103	Composition (3, 3)	3
ENG	201	Expository Writing I	3
**ENG	498	Undergraduate Seminar	3
Literature			
ENG	210	Principles of Literature	3
ENG	211, 212, 213, 314	Survey of English Literature (3, 3, 3, 3)	12
ENG	311, 312, 313	Survey of American Literature (3, 3, 3)	9
ENG	465	Literature for Adolescents	3
History and Development of Language			
ENG	371	General Linguistics	3
ENG	471	History of the English Language	3
ENG	472	Modern English Grammar	3
Reading			
EDSE	415	Reading in the Secondary School	3

Speech			
SPE	101*	Fundamentals of Oral Communication (3)	
SPE	260	Discussion	3

Certification in Journalism may be completed by taking COM 100–Basic Communications and 9 quarter hours in Journalism including the requirements for English.

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

*Included in Basic Environmental Studies.

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

Foreign Language Specialization–French

*Basic Courses			(37-55 Quarter Hours)
FRE	101, 102, 103	Elementary French Language and Civilization (3, 3, 3)	9
FRE	201, 202, 203	Intermediate French Language and Civilization (3, 3, 3)	9
Required Courses			
FRE	301	French Composition	4
FRE	303	French Conversation	4
FRE	311, 312, 313	Survey of French Literature (3, 3, 3)	9
FRE	401	French Phonetics and Diction	2
FRE	498	Undergraduate Seminar	3
FRE	300, 400	Electives	15

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

*May be exempted.

Foreign Language Specialization–Spanish

*Basic Courses			(37-55 Quarter Hours)
SPA	101, 102, 103	Elementary Spanish Language and Civilization (3, 3, 3)	9
SPA	201, 202, 203	Intermediate Spanish Language and Civilization (3, 3, 3)	9
Required Courses			
SPA	301	Spanish Composition	4
SPA	303	Spanish Conversation	4
SPA	311, 312, 313	Survey of Spanish Literature (3, 3, 3)	9
SPA	401	Spanish Phonetics and Diction	2

SPA	498	Undergraduate Seminar	3
SPA	300, 400	Electives	15

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

*May be exempted.

Library and Audiovisual Services Specialization*

Required Courses			(36 Quarter Hours)
EDEL	307	Literature for Children	3
ENG	465	Literature for Adolescents	3
LIB	301	Library Materials	3
LIB	321	Library Organization	3
LIB	322	Library Administration	3
LIB	334	Selection and Acquisition of Library Materials	3
LIB	384	History of Books and Libraries	3
LIB	424	School Library Administration	3
LIB	431	Cataloging and Classification I	3
LIB	444	Reference Materials and Services	3
LIB	451	Introduction to Educational Media	3
LIB	432	Cataloging and Classification II	3
or			
EDEL	407	Diagnosis and Treatment of Reading Difficulties	3

*Teacher 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.

Mathematics Specialization

Required Courses			(49-54 Quarter Hours)
*MATH	103	Elementary Functions	5
MATH	105	Finite Mathematics	5
MATH	121, 122, 123	Calculus with Analytical Geometry (5, 5, 5)	15
MATH	211	Linear Algebra	4
MATH	311	Algebraic Structures	3
MATH	315	Introduction to Number Theory	3
MATH	351, 352	Foundations of Geometry (3, 3)	6
MATH	491 or		
EDSE	493	Contemporary Mathematics	3
STAT	201	Principles of Statistics	4
STAT	341	Theory of Probability and Statistics	3
COMP	101	Introduction to Computer Science	3

*May be exempted.

Physical Education Specialization

Required Courses			(49 Quarter Hours)
EDPE	205	Instructional Analysis in Aquatics	2

EDPE	206	Instructional Analysis in Gymnastics and Tumbling	2
EDPE	207	Instructional Analysis of Individual and Dual Sports	2
EDPE	208	Instructional Analysis in Wrestling (M)	2
EDPE	209	Choreography of Contemporary Dance (W)	2
EDPE	215	Rhythmic Notation, Meter and Form	2
EDPE	216 or		
ZOOL	234	Anatomy and Physiology	4
EDPE	305	Rehabilitation Training Techniques	3
EDPE	306	Administration and Coaching	3
EDPE	307	School and Community Recreation	3
EDPE	308	Human Performance Learning	5
EDPE	309	Kinesiology	5
EDPE	321	Exercise Physiology–Cardiovascular	5
EDPE	322	Exercise Physiology–Respiratory	5
EDPE	405	Organization and Administration of Secondary School Physical Education	3
EDPE	406	Organization and Administration of Elementary School Physical Education	3

(M) Men only; (W) Women only.

Students will be required to complete all of the activities courses offered under Environmental Studies or demonstrate proficiency in the areas they request to exempt.

Physics Specialization

Physics Requirements			**(54-59 Quarter Hours)**
PHYS	111, 112, 113	General Physics (4, 3, 3)	10
PHYS	182, 183	Physics Laboratory (1, 1)	2
PHYS	227, 228	Classical Mechanics (3, 3)	6
PHYS	287	Measurements in Electricity and Magnetism	3
PHYS	288	Measurements in Electronics	3
PHYS	347, 348	Concepts in Modern Physics (3, 3)	6
PHYS	357, 358	Wave Motion and Optics (3, 3)	6
PHYS	491 or		
EDSE	494	Contemporary Physics	3
Mathematics Requirements			
*MATH	103	Elementary Functions	5
MATH	121, 122, 123	Calculus with Analytical Geometry (5, 5, 5)	15

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

*May be exempted.

Social Sciences and History Specialization

Required Courses			**(63-65 Quarter Hours)**
*HIST	201, 202, 203	Western Culture and Civilization (3, 3, 3)	

*Included in Basic Environmental Studies Program.

HIST	311, 312, 313	American History (3, 3, 3)	9
HIST	412, 413	United States History (3, 3)	6
*ECON	201, 202, 203	Principles of Economics (3, 3, 3)	
PCL	201	American National Government	3
PCL	341, 343	Comparative Government (3, 3)	6
SOC	201, 202	General Sociology (3, 3)	6
SOC	221	General Anthropology	3

Select Two Groups

Group I—History

HIST	415, 416	United States History (3, 3)	6
HIST	473	History of the Soviet Union	3
HIST	499	Undergraduate Research and Historical Method	3
HIST	300–400	History Elective	3

Group II—Economics

ECON	311	Intermediate Money, Income and Employment Theory	5
ECON	321	Statistics	3
ECON	341	International Economics	3
ECON	351	Economic History of the United States	3
ECON	411	Comparative Economic Systems	3

Group III—Political Science

PCL	203	Principles of Political Science	3
PCL	301	American State and Local Government	3
PCL	310	Congress and the Legislative Process	3
PCL	403	Political Behavior	3
PCL	427	American Foreign Policy	3

Group IV—Sociology

SOC	222	General Anthropology	3
SOC	231	Social Problems	3
SOC	304	The Development of Social Thought	3
SOC	331	Social Institutions	3
SOC	401	Research Methods in Sociology	3

*Included in Basic Environmental Studies.

POST-BACCALAUREATE CERTIFICATION

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

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

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

			Quarter Hours
1. Foundations of Education			
EDTA	405	Teaching Analysis	4
EDTA	406	Human Development	4
EDTA	407	Learning Theory	4
2. General Methods, Administration, Supervision and Curriculum			
EDEL	455	Elementary School Curriculum	4
EDPL	409	Teaching Strategies	4
EDSE	475	Secondary School Curriculum	4
3. Special Methods			
EDEL	312	Reading in the Elementary School	3
EDSE	478	Instructional Analysis in Business	4
EDSE	479	Instructional Analysis in English	4
EDSE	485	Instructional Analysis in Foreign Language	4
EDSE	486	Instructional Analysis in Mathematics	4
EDSE	487	Instructional Analysis in Physical Education	4
EDSE	488	Instructional Analysis in Science	4
EDSE	489	Instructional Analysis in Social Science	4
4. Practical Experience			
EDPL	465	Teaching Practicum	5
EDPL	466	Teaching Practicum	5

COLLEGE OF ENGINEERING AND TECHNOLOGY

Engineering at Florida Technological University is directed toward a profession for which education is best begun by completing the bachelor's degree program followed by professional education at the graduate level.

The satisfactory completion of a curriculum of a minimum of 192 quarter hours, including environmental studies courses, an engineering and science core curriculum, and both required and elective courses of study in a selected area of concentration of the student's choice, leads to the degree of Bachelor of Science in Engineering. Where omissions or deficiencies exist, i.e., in chemistry, English, physics, or mathematics, the student will need to complete more than the minimum of 192 quarter hours.

The principal areas of concentration in the engineering curriculum are devoted to the basic sciences, mathematics, the fundamentals of engineering science, and their application to the solution of engineering problems. These courses are not training courses for any of the mechanical or manipulative skills, but rather, are planned to provide preparation for development, planning, design, research, graduate work, and with certain electives, for operation, production, testing, maintenance and management.

The degree requirements consist of:

1. Environmental Studies Program	69 Quarter Hours
2. Engineering Core	98 Quarter Hours
3. Electives or Area of Concentration Courses	25 Quarter Hours
TOTAL	192 Quarter Hours

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.

Engineering And Science Core Requirements

The engineering and science 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.

Technical electives within a chosen specialization are selected with the approval of the student's faculty adviser and may be made from 300 level

courses or above in engineering, mathematics, the sciences, business administration, or a foreign language.

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 coursework, consistent with the needs of the student. The granting of a degree may be delayed until the work is satisfactorily completed.

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

Engineering areas of professional concentration are:

Aerospace	Industrial and Management
Civil	Mechanical
Electrical	Systems

The systems engineering curriculum consists of several systems-oriented courses found within one or more of the areas and will thus provide the student an opportunity to orient his program toward a concentrated systems approach or one representing inter-disciplinary coverage. He will prepare his program with the assistance of a faculty adviser knowledgeable in systems engineering.

ACADEMIC AREAS

The engineering areas and their subject matter are as follows:

Civil Engineering and Environmental Sciences

Sanitary and Environmental Engineering, Soil Mechanics and Engineering Geology, Solid Mechanics and Structural Engineering, Transportation Engineering, Urban Systems Engineering, and Water Resources Engineering.

Electrical Engineering and Communication Sciences

Analog and Digital Computer Systems, Electrical Networks and Elec-

tronics, Electromagnetic Fields, Electromechanics and Controls, Information Theory, and Solid State Systems and Devices.

Engineering Materials Sciences

Chemical and Physical Foundations of Materials, Metallurgy, Materials Processing, Materials Engineering, and Structure and Properties of Engineering Materials.

Engineering Mathematics and Computer Sciences

Engineering Mathematical Analysis, Engineering Statistics, Quantitative Analysis and Computing Techniques, and System Simulation with Digital Computers.

Industrial Engineering and Management Systems

Engineering Administration, Engineering Economic Analysis, Human Engineering, Operations Research, Production Design and Quality Control, Project Engineering, and Systems Analysis.

Mechanical Engineering and Aerospace Sciences

Aerospace Sciences, Energy Conversion, Flight Vehicle Structures, Measurement Systems Engineering, Mechanical Systems Design and Control, Energy Conversion and Power Systems, and Thermal Sciences.

ENGINEERING AND SCIENCE CORE REQUIREMENTS*

SUBJECT		CREDITS
COMP	102 Computer Programming	3
ENGR	101, 102 Engineering Graphics	4
ENGR	103 Creative Design	2
ENGR	111, 121, 131 Engineering Concepts Laboratory	3
ENGR	151, 152 Chemical Foundations of Engineering	6
MATH	121, 122, 123 Calculus with Analytical Geometry	15
ENGR	201, 202, 203 Engineering Design Case Studies	3
ENGR	211 Engineering Analysis - Statics	4
ENGR	221 Electrical Science	4
MATH	221 Calculus of Functions of Several Variables	4
ENGR	311 Engineering Analysis - Dynamics	4
ENGR	312 Mechanics of Materials	5
ENGR	321 Principles of Electrical Engineering	4
ENGR	322 Electrical Networks	4
ENGR	323 Electronic Engineering	4
ENGR	331 Thermodynamics	4
ENGR	332 Fluid Mechanics	4

ENGR	341	Engineering Economic Analysis	3
ENGR	342	Systems Analysis	3
ENGR	351	Structure and Properties of Materials	3
ENGR	352	Materials of Engineering	3
ENGR	361	Man and His Environment	3
ENGR	371	Probability and Statistics for Engineering	3
MATH	331	Differential Equations	4
PHYS	344	Modern Physics for Engineers	3
PHYS	354	Optics and Wave Motion for Engineers	3
ENGR	431	Transport Processes	3
ENGR	441	Technical Communications	3
ENGR	442	Operations Research	3
ENGR	443	Engineering Administration	3

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

TYPICAL BSE PROGRAM

	F	W	S
First Year			
COMP 102–Computer Programming			3
ENGL 101–Composition I	3		
ENGR 101, 102, 103–Engineering Graphics; Creative Design	2	2	2
ENGR 111, 121, 131–Engineering Concepts Laboratory	1	1	1
ENGR 151, 152–Chemical Foundations of Engineering	3	3	
MATH 121, 122, 123–Calculus with Analytical Geometry	5	5	5
Physical Education			1
Social Environment Courses	3	3	3
SPE 101–Fundamentals of Oral Communication		3	
	17	17	15
Second Year			
ENGR 201, 202, 303–Engineering Design Case Studies	1	1	1
ENGR 211, 311, 312–Engineering Analysis–Statics, Dynamics; Mechanics of Materials	4	4	5
ENGR 221–Electrical Science			4
ENGR 341–Engineering Economic Analysis			3
ENGR 361–Man and His Environment			3
MATH 221, 331–Calculus of Functions of Several Variables; Differential Equations	4	4	
PHYS 354–Optics and Wave Motion for Engineers		3	
Physical Education		1	
Social Environment Courses to include ECON 201	6	3	
	15	16	16
Third Year			
ENGR 321, 322, 323–Principles of Electrical Engineering; Electrical Networks; Electronic Engineering	4	4	4
ENGR 331, 332, 431–Thermodynamics; Fluid Mechanics; Transport Processes	4	4	3
ENGR 342, 441–Systems Analysis; Technical Communications	3	3	
ENGR 371–Probability and Statistics for Engineers	3		

ENGR 351, 352–Structure & Properties of Materials		3	
Materials of Engineering			3
Elective			3
HUM 301, 302, 303–Western Humanities	3	3	3
Physical Education			1
	17	17	17

Fourth Year

ENGR 443–Engineering Administration		3	
ENGR 442–Operations Research			3
Electives	7	7	8
Environmental Studies–Advanced Subjects	3	3	
PHYS 344–Modern Physics for Engineers	3		
Senior Seminar	2	2	4
	15	15	15

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

The realization that communication, aesthetic expression, and social progress must keep pace with scientific and technical advancement to insure our very existence, has been made clearly manifest in our atomic and space age. The College of Humanities and Social Sciences, with the other colleges of the University, aims at giving the student a better understanding of the usefulness and importance of his chosen specialization when placed in perspective with the other disciplines.

The College of Humanities and Social Sciences also has the responsibility of training a student to become proficient in one of the principal disciplines of the humanities or social sciences. In September of 1968 major programs for freshmen will be provided in art, communications, English, foreign languages, history, humanities, music, political science, psychology, and sociology. The majors open to juniors are English, history, psychology, and sociology. Each year the college will add other major programs.

Requirements for the Bachelor of Arts Degree from the College of Humanities and Social Sciences:

1. A minimum of 183 hours of credit, which must include the requirements in the Environmental Studies Program and those of the major department.

2. At least 72 credits from courses numbered 300 or above.

3. A student must maintain a cumulative grade average of C or better in all of his courses.

MAJOR IN ART

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

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

A major in art with studio concentration requires a minimum of 60 quarter hours in art courses or approved cognates, of which 15 must be taken in an area of specialization and 12 in art history. During the first two years, students should complete 30 quarter hours in art courses, including the following:

ART 201, 202, 203 Design (3, 3, 3)
ART 204, 205, 206 Drawing (3, 3, 3)
ART 207 20th Century Art (3)
ART 208 Ancient and Medieval Art (3)
ART 209 Renaissance, Baroque, and 19th Century Art (3) or
ART 210 Oriental Art (3)

A senior exhibition acceptable to the art faculty is required.

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

MAJOR IN COMMUNICATIONS

The Department of Communications affords the student an opportunity to concentrate in the area of communications with emphasis in journalism, radio-television, speech, or theatre. In order to graduate with a major in communications, a student must make a grade of C or better in each course taken within the department. A course taken in which a grade lower than C was earned must be repeated.

For a major in communications a minimum of 45 hours is required in communications, including the following required courses:

COM 100 Basic Communications (3)
SPE 260 Discussion (3)
SPE 261 English Phonetics and American Dialects (3)
SPE 262 Psychology of Oral Communication (3)
THA 180 Study of Drama and Theatre (3) or
THA 290 Interpretation I (3)

In the student's over-all program in communications, he must elect, in consultation with his adviser, 12-18 quarter hours in two of the areas of the Communications Department other than his field of emphasis.

While no major in journalism is presently available at Florida Technological University, courses in journalism are offered to enable students in the College of Education to meet state certification requirements and to help communications majors to have a broader program.

MAJOR IN ECONOMICS

Students majoring in economics in the College of Humanities and Social Sciences must take ACCY 307, ECON 201, 202, and 203, ECON 321, ENG 301, and thirty-five hours from the behavioral sciences, mathematics, and the social sciences. The Bachelor of Arts program is designed to permit greater flexibility in course selection to the economics major not planning a career in business.

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

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

I. GENERAL ECONOMICS

A. Required:

ECON 301 Intermediate Price Theory (5)
ECON 311 Intermediate Money, Income and Employment Theory (5)

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

II. QUANTITATIVE ECONOMICS

A. Required

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

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

MAJOR IN ENGLISH

The major in English consists of a minimum of 48 quarter hours, including the following required courses: ENG 211, 212, 213; 311, 312; 313 or 314; 471 plus 9 hours of either 421, 422, 423; 424, 425, 426; 427, 428, 429, or 451, 452, 453; 6 quarter hours from the following courses: 430, 431, 432, 433 or 434; and 12 hours to be selected in consultation with the student's adviser.

Students interested in secondary school teaching should plan to elect the combined English-Education major. They are further advised to achieve the broadest possible base in literature through taking the full range of survey courses in English and American literature, together with extensive training in writing and in the structure of the language.

Library science majors should also undertake to achieve a broad base

through survey courses and those specialized English courses that will contribute to their development as librarians.

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

MAJOR IN FOREIGN LANGUAGES

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

Major Requirements:

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

Combined Majors:

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

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

Placement of Students in Language Classes:

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

in the second quarter of the second year; two years, in the first quarter of the second year; one year, in the second quarter of the first year.

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

MAJOR IN HISTORY

Undergraduate students majoring in history must complete 45 quarter hours in that field. The required courses are:

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

An additional nine quarter hours credit in junior or senior level courses in American or Latin American history; nine quarter hours credit in junior or senior level courses in European history, plus nine more hours in history to be chosen with his adviser.

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.

MAJOR IN HUMANITIES

A minimum of 48 quarter hours in humanities courses is required for a major. The student should formulate his program with an adviser, but the following scheme will suggest a means of achieving a balanced program.

Humanities (Western) (required in Environmental Studies Program)	9
Non-Western Studies	3
American Studies	3
Area Courses (one course in each area)	15
Humanities electives	18
	48

In his work outside humanities the student should take at least two years of a foreign language. He should take the philosophy course in

aesthetics (PHI 311) and at least one other course concerned with the form and appreciation of an art (for example, Music Appreciation, Art Appreciation, or Literary Criticism), and he should elect courses in such related areas as anthropology, archaeology, art, literature, history, music and philosophy.

Prerequisites for all 300-399 courses in humanities are 45 quarter hours of college credit. Prerequisites for all 400-499 courses in humanities (exempting HUM 490) are 90 quarter hours of college credit, including 9 hours in Western Humanities.

JOURNALISM

(See Communications)

LIBRARY SCIENCE

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

MAJOR IN MUSIC

The degree of Bachelor of Arts with a major in music is a program designed for the study of music within a liberal arts curriculum while maintaining concentration in the professional area of performance and general musicianship. The minimum requirements for this degree are 183 quarter hours, including 75 hours in music from the following courses:

6 quarter hours of applied music during each of the four years
MUS 101, 102, 103 Music Theory (3, 3, 3)
MUS 201, 202, 203 Music Theory (3, 3, 3)
MUS 301, 302, 303 Counterpoint (3, 3, 3)
MUS 401, 402, 403 Form and Analysis (3, 3, 3)
MUS 104, 105, 106 Music Literature (1, 1, 1)
MUS 340, 341, 342 Music History (3, 3, 3)

MUS 450, 451, 452 Music of the Twentieth Century (2, 2, 2)
MUS 107, 108, 109 Ensemble (1, 1, 1)
MUS 207, 208, 209 Ensemble (1, 1, 1)
MUS 307, 308, 309 Ensemble (1, 1, 1)
MUS 407, 408, 409 Ensemble (1, 1, 1)

All students seeking this degree are expected to perform a faculty approved recital in their major applied area (instrument or voice). This recital is normally presented in the senior year.

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

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

PHILOSOPHY

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

MAJOR IN POLITICAL SCIENCE

The discipline of political science concerns itself with man in his political environment and the institutions through which he exerts his influence. Political science is thus interdisciplinary in its interest and yet segmentally focused into major areas of concern.

The major in political science consists of a minimum of 54 quarter hours, including 39 hours in the major and 15 in related fields. The major must include the following:

PCL 201 American National Government (3)
PCL 203 Principles of Political Science (3)

In addition, the student will elect 11 courses in political science, of which 5 must be from the 400 level. The remaining 15 quarter hours may be taken in such related fields as anthropology, economics, geography, history, mathematics, philosophy, psychology, sociology, or statistics according to the interests of the student and with the agreement of his adviser.

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.

MAJOR FOR PRE-LAW STUDENTS

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

MAJOR IN PSYCHOLOGY

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

PSY 201, 202 General Psychology (3, 3)
PSY 211 Methods of Psychological Research (2)
PSY 301 Basic Learning Processes (4)
PSY 303 Physiological Psychology (4)
PSY 309 Personality Theory (4)
PSY 401 Senior Research Proposal (2)
PSY 499 Undergraduate Research (8)

The remaining 14 quarter hours of psychology may be taken according to the interests of the student and with the agreement of his adviser.

Required courses from allied areas:

COMP 101 Introduction to Computer Science (3)
MATH 121 Calculus with Analytical Geometry (5) or
BIOL 200 Genetics (4)
STAT 401 Statistical Methods (3)
STAT 402 Statistical Methods (3)

RADIO-TELEVISION

(See Communications)

RELIGION

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

MAJOR IN SOCIOLOGY

The major in sociology consists of 49 quarter hours, including the following courses:

SOC	201, 202 General Sociology (3, 3)
SOC	221, 222 General Anthropology (3, 3)
SOC	231, 232 Social Problems (3, 3)
SOC	304 The Development of Sociological Thought (5)
SOC	306 Modern Sociological Thought (5)
SOC	401, 402 Research Methods in Sociology (3, 3)
STAT	401 Statistical Methods (3)

The remaining 12 quarter hours may be taken in either sociology or psychology, according to the interests of the student and with the agreement of his adviser.

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

SPEECH

(See Communications)

THEATRE

(See Communications)

COLLEGE OF NATURAL SCIENCES

The complexities of modern life can no longer be appreciated or faced intelligently without the basic knowledge provided by education in the sciences. Everyday activities in all areas depend more and more on the development and communication of ideas in the biological, mathematical, and physical sciences. As a result, the College of Natural Sciences will, through the Environmental Studies Program, provide every student with the opportunity to obtain some fundamental understanding in all the sciences.

In addition to providing every student with basic training in the sciences, the College of Natural Sciences will prepare students for careers in the biological, mathematical, and physical sciences. At this time, majors are available in the following fields:

Biological Science	Medical Technology
Chemistry	Physics
Computer Science	Statistics
Mathematics	

Preprofessional programs are also available to prepare students for further study in schools of dentistry, medicine, nursing, and veterinary medicine.

General Requirements for the Bachelor of Science Degree

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

1. at least 183 credits including the Environmental Studies Program, requirements of the major department, and electives;
2. at least 72 credits from courses numbered 300 or above;
3. at least one year of mathematics, one year of biological sciences, and one year of a physical science.

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

Program Planning

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

DEPARTMENT OF BIOLOGICAL SCIENCES

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

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

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

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

BIOLOGICAL SCIENCE CURRICULUM

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100; BOT 100)	3	3	3
(BIOL 101; ZOOL 101; BOT 101)	1	1	1
Chemistry (CHEM 121, 122, 123)	3	3	3
(CHEM 124, 125)		2	2
Communications (ENG 101, SPE 101, COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)*	5	5	5
Physical Education	1		
	16	17	17
Second Year			
Biological Sciences (MICR 100, BIOL 200)	3		4
(MICR 101)	1		
Chemistry (CHEM 221, 222, 223)	3	3	3
Foreign Language**	3	3	3
Humanities (HUM 301, 302, 303)	3	3	3
Physical Education		1	
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option B–Group I or II)		3	
	17	17	17

BIOLOGY OPTION

Third Year			
Biological Sciences (BOT elect, BIOL 320, ZOOL elect)	4	4	4
Business (BADM 301)	3		
Chemistry (CHEM 224, 225)	3	3	
(CHEM 321, 322)		3	3
Physical Education			1
Senior Seminar			2
Social Environment (Option B)			
Group I	3		
Group II		3	
Statistics (STAT 401)	3		
Technology			3
Electives***		4	
	16	17	13

Fourth Year			
Biological Sciences (MICR 320; BIOL 330, 310)	4	3	3
(Electives numbered 300 or higher from BIOL, BOT, MICR, or ZOOL)	3	3	3
Senior Seminar	2	2	2
Electives***	6	6	6
	15	14	14

BOTANY OPTION

Third Year			
Biological Sciences (BOT 340, 300, 350)	4	4	4
Business (BADM 301)	3		
Chemistry (CHEM 224, 225)	3	3	
(CHEM 321, 322)		3	3
Physical Education			1
Senior Seminar			2
Social Environment (Option B)			
Group I	3		
Group II		3	
Statistics (STAT 401)	3		
Technology			3
Electives***		4	
	16	17	13

Fourth Year			
Biological Sciences (BOT 330, 331; BOT or BIOL electives)	3	3	10
Senior Seminar	2	2	2
Electives***	9	9	3
	14	14	15

MICROBIOLOGY OPTION

Third Year			
Biological Sciences (MICR 330, 340, 310)	4	4	4
Business (BADM 301)	3		
Chemistry (CHEM 224, 225)	3	3	
(CHEM 321, 322)		3	3
Physical Education			1

Senior Seminar			2
Social Environment (Option B)			
Group I	3		
Group II		3	
Statistics (STAT 401)	3		
Technology			3
Electives***		4	
	16	17	13

Fourth Year

Biological Sciences (MICR 320, 410; MICR or BIOL electives)	4	3	9
Senior Seminar	2	2	2
Electives***	9	9	3
	15	14	14

ZOOLOGY OPTION

Third Year

Biological Sciences (ZOOL 200, 220, 221)	4	3	3
Business (BADM 301)	3		
Chemistry (CHEM 224, 225)	3	3	
(CHEM 321, 322)		3	3
Physical Education			1
Senior Seminar			2
Social Environment (Option B)			
Group I	3		
Group II		3	
Statistics (STAT 401)	3		
Technology			3
Electives***		4	2
	16	16	14

Fourth Year

Biological Sciences (ZOOL 300, 310; ZOOL or BIOL electives)	4	4	8
Senior Seminar	2	2	2
Electives***	9	9	3
	15	15	13

Minimum credits required for graduation, 190.

*Students deficient in algebra and trigonometry must make up this deficiency by taking MATH 103, Elementary Functions.

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

***Students planning on graduate study in molecular areas of biology should take electives in the areas of statistics and biochemistry including: STAT 402; CHEM 441, 442, 443, 444, 445.

Premedical, Predental, and Preveterinary Program

Although many professional schools accept students who have satisfactorily completed three years of college, a large number of medical schools also require completion of the baccalaureate degree. This curriculum through the junior year satisfies the requirements for admission to all dental schools and to most medical schools as listed in the current editions of *Medical School Admission Requirements in the U.S.A. and Canada* published by the Association of American Medical Colleges and *Admission Requirements of American Dental Schools* published by the American Association of Dental Schools. In addition, it provides the prerequisites for electing major work in Biology and/or Chemistry during the senior year, thereby meeting admission requirements of those professional schools requiring the bachelor's degree. Students who complete the junior year at Florida Technological University may obtain a Bachelor of Science degree after completing the first year of study (not less than 33 quarter credit hours) with a grade point average of "C" or better at an approved professional school. Following completion of the first year of professional study, the student shall request the dean of the professional school to forward a transcript of credits and a recommendation that the degree be conferred to the Dean of the College of Natural Sciences at Florida Technological University.

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

Premedical, Predental, and Preveterinary Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100; BOT 100)	3	3	3
(BIOL 101; ZOOL 101; BOT 101)	1	1	1
Chemistry (CHEM 121, 122, 123)	3	3	3
(CHEM 124, 125)		2	2
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)*	5	5	5
Physical Education	1		
	16	17	17
Second Year			
Biological Sciences (MICR 100; ZOOL 220, 221)	3	3	3
(MICR 101)	1		
Chemistry (CHEM 221, 222, 223)	3	3	3
Foreign Language**	3	3	3
Humanities (HUM 301, 302, 303)	3	3	3
Physical Education		1	
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
	17	17	16

Third Year			
Biological Sciences (ZOOL 300; BIOL 320, 200)	4	4	4
Business (BADM 301)			3
Chemistry (CHEM 224, 225)	3	3	
(CHEM 321, 322)		3	3
Senior Seminar			2
Social Environment (Option B–Group I or II)	3		
Group I		3	
Group II			3
Statistics (STAT 401)	3		
Technology			3
Electives	3	3	
	16	16	18

Fourth Year

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

*Students deficient in algebra and trigonometry must make up this deficiency by taking MATH 103, Elementary Functions.

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

Medical Technology Program

Technicians are prepared for positions in scientific and hospital laboratories, clinics, Public Health Service Laboratories, and in various local, state and federal health organizations.

Students who complete the three-year program shown on pages 80-81 may obtain a Bachelor of Science degree after completing one year of study (not less than 35 quarter credit hours) with a grade point average of "C" or better at a hospital having a medical technology program approved by Florida Technological University, the American Society of Clinical Pathologists, and the Council on Medical Education and Hospitals of the American Medical Association. Following completion of the hospital program, the student shall request the hospital school director to forward a transcript of credits and a recommendation that the degree be conferred to the Dean of the College of Natural Sciences at Florida Technological University.

Required courses in the Medical Technology program are identified by course number in the following curriculum.

Medical Technology Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100)	3		3

(BIOL 101; ZOOL 101)	1		1
Chemistry (CHEM 111, 112, 113)	4	3	3
(CHEM 114, 115)		1	1
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 103, 121, 122)	5	5	5
Physical Education		1	
Social Environment (Option B–Group I or II)		3	
	16	16	16

Second Year

Biological Sciences (MICR 100; ZOOL 330; MICR 310)	3	4	4
(MICR 101)	1		
Business (BADM 301)			3
Chemistry (CHEM 321, 322)	3	3	
Humanities (HUM 301, 302, 303)	3	3	3
Physical Education			1
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option B)			
Group I		3	
Group II			3
Statistics (STAT 201)	4		
	18	17	18

Third Year

Biological Sciences (MICR 320; ZOOL 320; ZOOL 310)	4	4	5
(MICR 210)			2
Foreign Language*	3	3	3
Physical Education			1
Senior Seminar		2	2
Technology	3		
Electives	6	6	3
	16	15	16

Fourth Year

The senior year will be taken in residence at an approved hospital as noted in the description of the medical technology program (page 80).

Minimum credits required for graduation, 183.

*Proficiency in Russian, German, French, Spanish or another foreign language approved by the student's adviser can be demonstrated by examination or by successful completion of 9 credits of the language.

Other Preprofessional Programs

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

DEPARTMENT OF CHEMISTRY

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

A student will, upon graduation, find opportunities for employment in industry, government service, and education. Positions may entail basic research or applied research, product development or control, sales, management, or teaching.

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

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

Chemistry Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100)	3		
(BIOL 101)	1		
(electives)*		4	4
Chemistry (CHEM 100)	1		
(CHEM 121, 122, 123)	3	3	3
(CHEM 124, 125)		2	2
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121,122, 123)	5	5	5
Physical Education	1		
	17	17	17
Second Year			
Business (BADM 301)		3	
Chemistry (CHEM 221, 222, 223)	3	3	3
(CHEM 226)			2
Humanities (HUM 301, 302, 303)	3	3	3
Mathematics (MATH 211, 331)	4		4
Physical Education		1	

Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option B–Group I or II)	3		
Technology		3	
	17	17	16
Third Year			
Chemistry (CHEM 224, 225)	3	3	
(CHEM 227, 321, 322)	2	3	3
(CHEM 399)			1
German (GER 101, 102, 103)**	3	3	3
Physical Education	1		
Physics (PHYS 289)			3
Social Environment (Option B)			
Group I	3		
Group II		3	
Statistics (STAT 401)	3		
Electives***		5	6
	15	17	16
Fourth Year			
Chemistry (CHEM 323, 324)	3	3	
(CHEM 499)	3	3	3
German (GER 201, 202, 203)**	3	3	3
Professional Report Writing (ENG 301)			3
Senior Seminar	4	2	2
Electives***	3	3	2
	16	14	13

Minimum credits required for graduation, 192.

*Students may defer taking the 8 hours of electives in the biological sciences until a later year. If they do so, it is recommended that some of the Social Environment requirements be taken in the first year.

**Proficiency in German can be demonstrated by examination or by successful completion of 18 quarter-hours of the language.

***Of the 19 quarter-hours of electives shown in the junior and senior years, 9 must be taken in chemistry.

DEPARTMENT OF MATHEMATICAL SCIENCES

The current explosion in scientific knowledge is accompanied by, and largely dependent on, recent developments in the mathematical sciences. Mathematics has, of course, long been used as a tool by the engineer and the physical scientist. In recent years, statistics and computer science have also assumed an important role in engineering and the physical sciences; and now all three of these disciplines are becoming indispensable in business and the biological, behavioral, and social sciences as well.

Mathematics, statistics, and computer science courses offered at Florida Technological University are designed to serve four kinds of students: (1) those who want to become professional mathematicians, statisticians, or

computer scientists; (2) those who intend to teach mathematics in the nation's secondary schools; (3) those who need to use mathematics, statistics, and computer science as tools in other areas; and (4) those who desire to increase their knowledge and understanding in these important scientific disciplines.

Students graduating in the mathematical sciences will find many opportunities for employment in industry, government, and education since the demand for persons with such training far exceeds the supply.

Graduates of an undergraduate degree program in the mathematical sciences will, of course, be eligible to continue their studies at the graduate level in mathematics, statistics, or computer science.

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

Mathematics Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100; BOT 100)	3	3	3
(BIOL 101; ZOOL 101; BOT 101)	1	1	1
Chemistry (CHEM 111, 112, 113)	4	3	3
(CHEM 114, 115)		1	1
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)	5	5	5
Physical Education	1		
	17	16	16
Second Year			
Computer Science (COMP 201, 202, 203)	3	3	3
Humanities (HUM 301, 302, 303)	3	3	3
Mathematics (MATH 211, 221, 331)	4	4	4
Physical Education	1		
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option B–Group I or II)	3		
Group I		3	
Group II			3
	18	17	17
Third Year			
Business (BADM 301)	3		
Foreign Language*	3	3	3
Mathematics (MATH 311, 312, 313)	3	3	3
Physical Education	1		
Senior Seminar			2
Statistics (STAT 341, 342, 343)	3	3	3
Technology		3	
Restricted Electives**	3	3	3
	16	15	14

Fourth Year			
Mathematics (MATH 421, 422, 423)	3	3	3
Senior Seminar	2	2	2
Restricted Electives**	3	3	3
Electives	5	5	3
	13	13	11

Minimum credits required for graduation, 183.

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

**Mathematics majors must take an additional 18 quarter-hours in mathematics at the 300 level or higher. All electives must be approved by the student's adviser.

Statistics Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100; BOT 100)	3	3	3
(BIOL 101; ZOOL 101; BOT 101)	1	1	1
Chemistry (CHEM 111, 112, 113)	4	3	3
(CHEM 114, 115)		1	1
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)	5	5	5
Physical Education	1		
	17	16	16
Second Year			
Humanities (HUM 301, 302, 303)	3	3	3
Mathematics (MATH 211, 221, 331)	4	4	4
Physical Education			1
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option A–Group I)	3	3	3
Statistics (STAT 201, 332)	4	3	
	18	17	15
Third Year			
Biological Sciences (BIOL 200)			4
Business (BADM 301)	3		
Mathematics (MATH 311, 312, 313)	3	3	3
Physical Education	1		
Social Environment (Option A–Group II)	3	3	3
Statistics (STAT 341, 342, 343)	3	3	3
(STAT 401, 402, 403)	3	3	3
Technology		3	
	16	15	16

Fourth Year			
Computer Science (COMP 481, 482, 483)	3	3	3
Senior Seminar	4	2	2
Statistics (STAT 433, 411)	3		3
(Stat 421)			3
Electives	5	6	
	15	11	11

Minimum credits required for graduation, 183.

Computer Science Curriculum

	F	W	S
First Year			
Biological Sciences (BIOL 100; ZOOL 100; BOT 100)	3	3	3
(BIOL 101; ZOOL 101; BOT 101)	1	1	1
Chemistry (CHEM 111, 112, 113)	4	3	3
(CHEM 114, 115)		1	1
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)	5	5	5
Physical Education	1		
	17	16	16
Second Year			
Computer Science (COMP 201, 202, 203)	3	3	3
Humanities (HUM 301, 302, 303)	3	3	3
Mathematics (MATH 211, 221, 331)	4	4	4
Physical Education	1		
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
Social Environment (Option B–Group I or II)	3		
Group I		3	
Group II			3
	18	17	17
Third Year			
Business (BADM 301)	3		
Computer Science (COMP 301, 302, 303)	3	3	3
Foreign Language*	3	3	3
Mathematics (MATH 311, 312, 313)	3	3	3
Physical Education	1		
Senior Seminar			2
Statistics (STAT 341, 342, 343)	3	3	3
Technology		3	
	16	15	14
Fourth Year			
Computer Science (COMP 401, 411, 421)	3	3	3
(COMP Electives)	3	3	3
Senior Seminar	2	2	2
Electives	6	4	3
	14	12	11

Minimum credits required for graduation, 183.

*Proficiency in French, German, Russian or another foreign language approved by the student's adviser can be demonstrated by examination or by successful completion of

9 credits of the language. Students expecting to enter graduate school should seriously consider electing an additional 3 quarters of the language.

DEPARTMENT OF PHYSICS

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

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

Required courses leading to the Bachelor of Science degree in physics are identified by course number in the curriculum which appears on the following pages.

Physics Curriculum

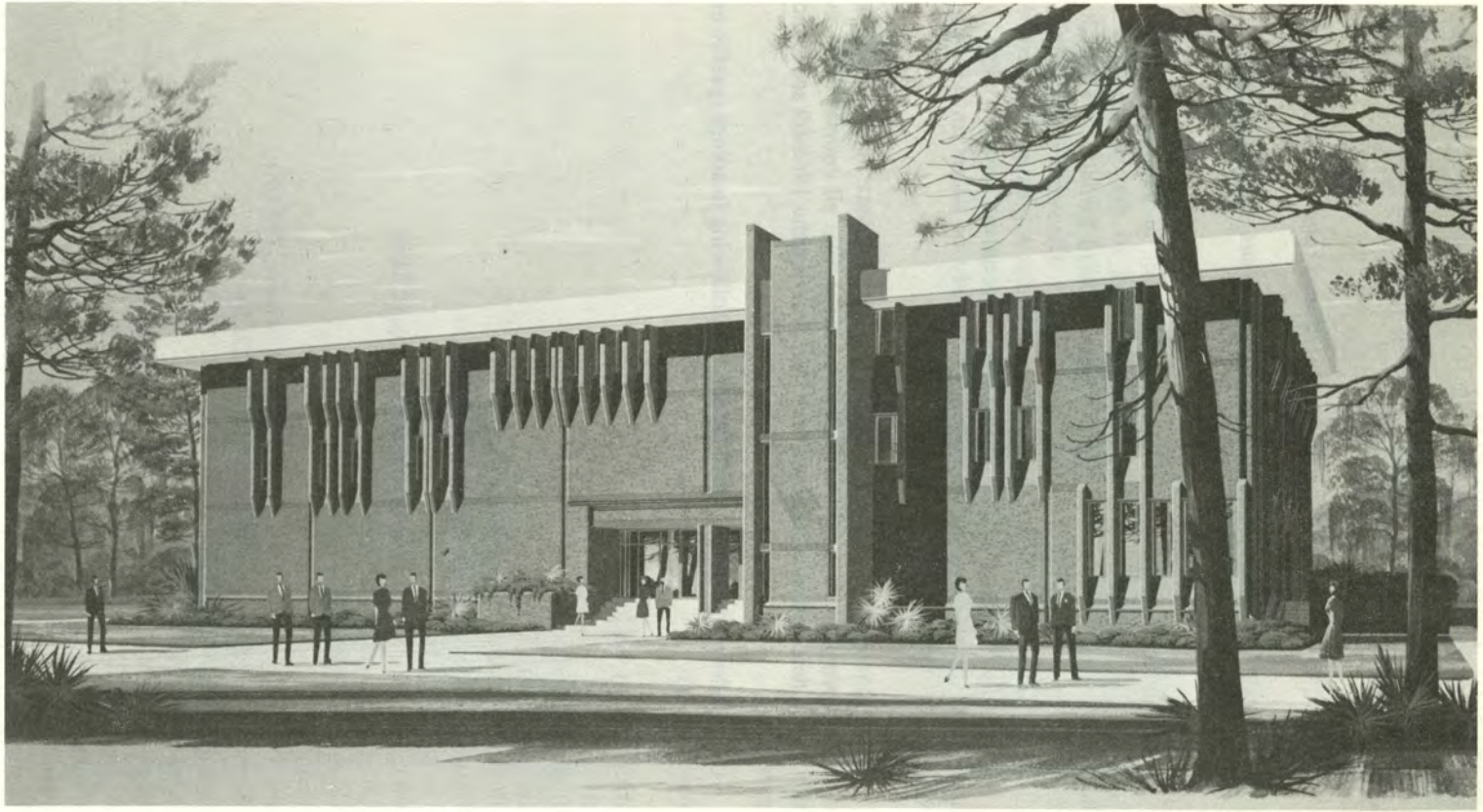
	F	W	S
First Year			
Chemistry (CHEM 111, 112, 113)	4	3	3
(CHEM 114, 115)		1	1
Communications (ENG 101; SPE 101; COMP 101 or COMP 102)	3	3	3
Mathematics (MATH 121, 122, 123)	5	5	5
Physical Education	1		
Physics (PHYS 111, 112, 113)	4	3	3
(PHYS 182, 183)		1	1
	17	16	16
Second Year			
Biological Sciences (BIOL 100; BOT 100 or ZOOL 100; BIOL 200)	3	3	4
(BIOL 101; BOT 101 or ZOOL 101)	1	1	
Humanities (HUM 301, 302, 303)	3	3	3
Mathematics (MATH 211, 221, 331)	4	4	4
Physical Education	1		
Physics (PHYS 221, 222, 223)	3	3	3
Social Environment (Option B–Group I or II)	3		
Group I		3	
Group II			3
	18	17	17

Third Year			
Business (BADM 301)		3	
Foreign Language*	3	3	3
Physical Education	1		
Physics (PHYS 331, 332, 333)	3	3	3
(PHYS 341, 342, 343)	3	3	3
(PHYS 381, 382, 383)	3	3	3
Statistics (STAT 401)	3		
Technology			3
	16	15	15
Fourth Year			
Senior Seminar	4	2	2
Restricted Electives**	9	9	9
Electives	4	3	3
	17	14	14

Minimum credits required for graduation, 192.

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

**Physics majors must take 27 quarter-hours of electives in mathematics or physics at the 300 level or higher. All electives must be approved by the student's adviser. Twenty-four of these credits will normally be taken from PHYS 335, 336, 351, 352, 384, 385, 461, 471, 472, and 475.



General Classroom Building

COURSE DESCRIPTIONS

The courses in each instructional area are numbered from 100 through 499, according to the following groups:

100-299–Courses primarily for freshmen and sophomore students.
300-499–Courses primarily for juniors, seniors, and beginning graduate students.

After the title of each course is one number in parentheses which indicates the number of credit hours assigned to the course. At the beginning of most course descriptions will be found the letters PR or CR, followed by some course numbers or a statement. The symbols PR and CR denote a prerequisite or a corequisite, respectively. A prerequisite must be completed before the course listing the prerequisite can be taken; a corequisite must either be completed previously or taken concurrently with the course listing the corequisite.

The following courses are listed to aid the student in planning his academic program. It is not intended, however, that all courses listed in the course description section will be offered during the 1968-69 academic year.

Course descriptions are listed under the following headings (prefix in parentheses):

Accountancy (ACCY)
Art (ART)
Biology (BIOL)
Botany (BOT)
Business Administration (BADM)
Business Education–Developmental (EDBE)
Chemistry (CHEM)
Civil Engineering and Environmental Sciences (CEES)
Communications (COM)
Computer Science (COMP)
Economics (ECON)
Electrical Engineering and Communication Sciences (EECS)
Elementary Education–Developmental (EDEL)
Engineering Core (ENGR)
Engineering Materials Sciences (EMS)
Engineering Mathematics and Computer Sciences (EMCS)
English (ENG)
Finance (FIN)
French (FRE)
German (GER)

History (HIST)
Humanities (HUM)
Industrial Engineering and Management Systems (IEMS)
Journalism (JRN)
Library Science (LIB)
Management (MGMT)
Marketing (MKTG)
Mathematics (MATH)
Mechanical Engineering and Aerospace Sciences (MEAS)
Microbiology (MICR)
Music (MUS)
Philosophy (PHI)
Physical Education–Developmental (EDPE)
Physical Education–Environmental Studies (ESPE)
Physics (PHYS)
Political Science (PCL)
Professional Laboratory–Application (EDPL)
Psychology (PSY)
Radio – Television (RTV)
Religion (REL)
Russian (RUS)
Science (SCI)
Secondary Education–Developmental (EDSE)
Sociology (SOC)
Spanish (SPA)
Speech (SPE)
Statistics (STAT)
Teaching Analysis (EDTA)
Theatre (THA)
Transportation
Zoology (ZOOL)

ACCOUNTANCY

ACCY 101 Basic Concepts (3)
Accounting and business procedures, introduction to recording of business transactions, recording and controlling cash, receivables, payables. Reliance of business on accounting.

ACCY 102 Basic Concepts (3)
PR: ACCY 101. Adjustment of operating data, financial statements, partnerships, corporations and other forms of business. Branch accounting.

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

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

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

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

ACCY 312 Intermediate Accounting (3)
PR: ACCY 311. Purchase and sale of assets. Consolidations, mergers, leases, and other forms of business cooperation. Analysis of depreciation methods. Standards in professional accounting.

ACCY 313 Advanced Accounting (3)
PR: ACCY 312. Regulation of business and its accounting requirements. Impact of the federal and other income taxes. Report preparation for both internal and external use.

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

ACCY 322 Cost Accounting (3)
PR: ACCY 321. The development of cost accounting. Its purposes and its shortcomings. Coordination of cost accounting with general accounting records. Methods of cost analysis and cost application.

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

ACCY 334 Audit Report Writing (3)
PR: ACCY 331. Preparation of audit reports. Legal and professional responsibilities of the auditor. Specialized reports and analyses. Professional ethics.

ACCY 341 Governmental Accounting (3)

PR: ACCY 313. Budget, accounting and reporting problems of state and national governments. Design and installation of appropriate accounting systems. Improvement of methods and procedures for public bodies.

ACCY 342 Municipal Accounting (3)
PR: ACCY 313. Accounts of institutions, municipalities, and other local governments; organization, procedure, budget, accounts and records, reports, audits.

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

ACCY 352 Federal Income Tax Accounting (3)
PR: ACCY 351. Corporation tax returns. Study of accounting methods acceptable for tax purposes. Study of federal income tax procedures and appeals methods.

ACCY 361 Computer Applications to Accounting Problems (3)
PR: ACCY 313. The purpose of the computer in financial management. Its use as part of the accounting process. Place of the computer in present day accounting, budgeting and auditing matters.

ACCY 423 Cost Accounting (3)
PR: ACCY 322. Advanced cost accounting. The purposes of cost budgeting for public bodies. Data available through cost accounting and their use in management. Current problems in cost analysis and cost control.

ACCY 432 Auditing (3)
PR: ACCY 331. Verification of financial statements, auditing of specialized industries. Application of logic to the audit process. Auditing computerized records.

ACCY 443 Problems of Funds Control (3)
PR: ACCY 341. Special problems arising in state and national government. System design for achieving improvements and advances. Study of current literature on funds control. Coordination of accounting with other disciplines for effective system design.

ACCY 453 Federal Income Tax Accounting (3)
PR: ACCY 352. Planning long-range programs relative to income tax requirements. Special problems in regard to federal income taxation.

***ACCY 464 Interpretation of Accounting Data (3)**
PR: ACCY 361. Advanced analysis, advanced report writing and application of computer to accounting and auditing problems.

*May not be offered before 1970.

ACCY 491 Problem Analysis (3)
PR: ACCY 331, 341, 351, and 361. Advanced C.P.A. problems for accounting majors. Problems in several forms of organization. Advanced statement preparation and analysis.

***ACCY 492 Professional Accounting Problems (3)**
PR: ACCY 491. Advanced C.P.A. problems. Consolidations, mergers, associations and other forms of organization.

***ACCY 493 Modern Professional Practice (3)**
PR: ACCY 491. The relation of the accounting profession to business and social institutions. Professional standards and their application to current economic conditions.

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

ART

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

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

ART 207 20th Century Art (3)

ART 208 Ancient and Medieval Art (3)

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

ART 210 Oriental Art (3)

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

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

*May not be offered before 1970.

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

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

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

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

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

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

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

***ART 497 Independent Study (2-5)**
PR: Consent of instructor. May be repeated for credit.

***ART 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

BIOLOGY

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

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

*May not be offered before 1970.

BIOL 200 Genetics (4)
PR: BIOL 100. Basic principles of heredity as applied to plants and animals. Laboratory will emphasize work with *Drosophila.*

***BIOL 310 Immunology and Serology (3)**
PR: 11 hours in biological sciences. Infection and the immune reaction; properties of antigens, production of antibodies; agglutination and precipitin reactions; quantitative techniques and isohemoagglutination.

BIOL 320 Cytology (4)
PR: BIOL 100 and junior standing. Structure of vegetative and reproductive cells; cytoplasmic differentiation; mitosis, meiosis, chromosomal aberrations.

BIOL 330 Cell Physiology (3)
PR: CHEM 123 and CHEM 125. Basic physiological processes, cellular organization, exchange of materials, conversion of energy, irritability and contractibility.

***BIOL 410 Principles of Adaptation (3)**
PR: 11 hours in biological sciences. An outline of evolutionary principles, natural selection, and phylogeny; origin of variation and origin of species.

***BIOL 420 History of Biology (2)**
PR: Junior standing. People and events from Aristotelian times to the present; development of science of biology.

BIOL 491 Contemporary Biology (3)
PR: Consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as BSCS biology and other modern approaches to secondary school biology. For prospective teachers of biology. (Same as EDSE 491).

BIOL 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOL 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOL 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

BIOL 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

*May not be offered before 1970.

BOTANY

BOT 100 General Botany (3)
PR: BIOL 100. Introduction to botany; structure, function, representative groups of plant kingdom.

BOT 101 General Botany Laboratory (1)
Laboratory exercises illustrating basic principles in botany; taken concurrently with BOT 100.

BOT 300 Plant Taxonomy (4)
PR: BOT 100. Classification of seed plants; introductory methods of collection; representative plant families.

BOT 330, 331 Plant Physiology (3, 3)
PR: BOT 100 and junior standing. Chemical and physical activities of plants; absorption, transpiration, mineral nutrition, photosynthesis, and growth.

BOT 340 Plant Anatomy (4)
PR: BOT 100. Development and structure of the root, stem, and leaf of vascular plants.

BOT 350 Plant Ecology (4)
PR: BOT 100 and 11 hours in biological sciences. Effects of environmental factors on various plant groups; succession and stabilization of plant communities.

BOT 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

BOT 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

BOT 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

BOT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

BUSINESS ADMINISTRATION

BADM 101 Business (4)
Survey of managerial divisions of finance, production, personnel, and marketing in business. Business terminology and overall structure of business in its environment. Historical and economic prospectives are

considered. This course open only to students at freshman or sophomore level.

BADM 301 Business Concepts (3)
PR: Junior standing. The role of business and the environment in which it operates are considered. The responses business makes to freedom, ownership, the market economy and government are discussed. This course satisfies the Advanced Environmental studies requirement for business.

BADM 311, 312 Mathematical Applications to Business (3, 3)
PR: MATH 123 or equivalent. A study of a wide range of quantitative decision procedures as applied to problems in business administration.

BADM 371 Business Law (3)
PR: Junior standing. Introduction to the law and the use of the case method. The law of business contracts.

BADM 372 Business Law (3)
PR: BADM 371. The uniform commercial code. Law of sales, law relating to negotiable instruments, the law of banks and banking.

BADM 373 Business Law (3)
PR: BADM 372. Law of agency, partnerships, and corporations.

BADM 444 International Business Operation (3)
PR: ECON 341. An integration of economics and the functional areas of business focused upon the problems of managing international business operations. Economic, legal, functional and administrative problems are studied through cases and literature emphasizing financial and marketing problems.

***BADM 474 Business Law, Interests in Property (3)**
PR: BADM 373 or consent of instructor. Secured transactions, principles of property, personal and real, the law of bankruptcy, the law of suretyship.

BADM 484 Operations Research (3)
PR: ECON 321. Methods and models of operations research applied to specific business problems. Develops use of mathematical techniques and demonstrates its use in modern decision theory.

BADM 490 Senior Seminar: Business in Human Affairs (2)
Business issues and problems as they relate to human affairs. This course, primarily intended for the senior student, is offered as one of the

*May not be offered before 1970.

Advanced Environmental Studies seminars. Not open to the student majoring in the College of Business Administration.

BADM 495 Business Policies (5)
PR: Senior standing and completion of all other business core course requirements, or consent of instructor. A study of problems confronting businessmen. The student will be expected to utilize the subject matter contained in the business core courses and his major in the analysis of business problems.

BUSINESS EDUCATION – Developmental

EDBE 101 Introductory Typewriting (3)
For the student with no previous instruction in typewriting. Development of basic elements in using the typewriter as a tool of literacy and communications.

EDBE 102 Communications Production – I (3)
PR: EDBE 101 or equivalent. Continuation of development of skills in speed and accuracy and introduction to skill building procedures in communications production.

EDBE 103 Communications Production – II (3)
PR: EDBE 102 or equivalent. Expansion of communications production development, speed and accuracy.

EDBE 201 Principles of Shorthand – I (3)
PR: Concurrent enrollment in EDBE 101 or equivalent. For students with no previous instruction in shorthand. Introduction to basic theory of Gregg Shorthand, vocabulary development, and speed building.

EDBE 202 Principles of Shorthand – II (3)
PR: EDBE 102, and EDBE 201 or equivalents. A continuation in the study of shorthand theory, vocabulary development, and speed building.

EDBE 203 Principles of Shorthand – III (3)
PR: EDBE 103, and EDBE 203 or equivalents. Development and refinement of sustained shorthand dictation, speed and vocabulary development.

EDBE 301 Shorthand Dictation (3)
PR: EDBE 103, and EDBE 203 or equivalents. Continued development and refinement of shorthand dictation and introductory communications productions.

EDBE 302 Shorthand Transcription (3)
PR: EDBE 102, and EDBE 301. Gregg Shorthand dictation and refinement of communications production.

EDBE 305 Office Technology (3)
PR: EDBE 103 or equivalent. Basic operation and function of technological media in modern business offices.

EDBE 405 Principles of Business – Vocational Education (3)
PR: Senior standing. Study of historical development of business–vocational education with specific emphasis on identification and interpretation of present day trends and problems.

***EDBE 406 Office Systems and Procedures (3)**
PR: EDBE 302 and 305. Study of the responsibilities of the executive secretary and office supervisor; records management, travel services, case studies in human relations in executive level job performance.

CHEMISTRY

CHEM 100 Freshmen Orientation (1)
A discussion session required of all chemistry majors to acquaint students in the curriculum with the profession.

CHEM 111, 112, 113 General Chemistry (4, 3, 3)
A course designed to develop a reasonable appreciation of chemistry by the non-major. Fundamental theories, inorganic, organic, natural products, biochemistry, and industrial processes will be discussed with emphasis on word concepts. This course, although not adequate preparation for most advanced lecture courses, will provide the necessary background for students wishing to participate in many of the laboratory courses.

CHEM 114, 115 General Chemistry Laboratory (1, 1)
PR: CHEM 111. A course to acquaint the non-major with some of the chemical arts as practiced in the inorganic, organic, and biochemical fields.

CHEM 121, 122, 123 Organic Chemistry (3, 3, 3)
Fundamentals of organic chemistry including nomenclature, structure, and theory of reactions.

CHEM 124, 125 Organic Laboratory Techniques (2, 2)
PR: CHEM 121 or CHEM 113. A lecture-laboratory course for the development of laboratory skills through class-developed experiments. An open-ended approach is used.

CHEM 221, 222, 223, 224, 225 Chemistry Fundamentals (3, 3, 3, 3, 3)
PR: MATH 123. A course in the theory of chemical reactions. Atomic structure and chemical bonding theory, chemical periodicity, stoichiometry and equilibria, thermodynamics, and kinetics will be included.

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CHEM 226, 227 Physical Chemistry Measurements (2, 2)
PR: CHEM 222 or CHEM 113. 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 321, 322, 323, 324 Analytical Laboratory Technique (3, 3, 3, 3)
PR: CHEM 223 and CHEM 123; or CHEM 113. A lecture-laboratory course to develop the analytical arts using current techniques on problems chosen from all fields of chemistry. Instrumental and radioisotope techniques will be included.

CHEM 399 Introduction to Research (1)
A discussion course required of all chemistry majors in order to introduce them to the science and art of research as practiced in chemistry. Topics will be presented by staff and visiting scientists relative to their personal research efforts.

***CHEM 431 Inorganic Chemistry (3)**
PR: CHEM 225. A discussion of descriptive inorganic chemistry based on various bonding theories, thermodynamics, and kinetics.

CHEM 441, 442, 443 Biochemistry (3, 3, 3)
PR: CHEM 123 and CHEM 225. A consideration of the general properties of proteins, carbohydrates, and nucleic acids. Enzymes and their effect on biochemical systems will be discussed. Intermediary metabolism will be a central theme throughout the course.

CHEM 444, 445 Biochemical Methods (2, 2)
PR: CHEM 113 or CHEM 441; and CHEM 322. A laboratory course stressing the application of the chemical arts to the separation, identification and quantitation of materials of biological significance.

***CHEM 451 Physical Chemistry (3)**
PR: CHEM 225 and MATH 331. Consideration of chemical thermodynamics, kinetics, and quantum mechanics.

CHEM 461, 462 Advanced Organic Chemistry (3, 3)
PR: CHEM 123 and CHEM 225. A consideration of organic reaction mechanisms in the light of bonding theories, thermodynamics, and kinetics.

CHEM 491 Contemporary Chemistry (3)
PR: Consent of instructor. Concepts, experiments, problems and advanced

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topics included in courses such as CHEM Study and other modern approaches to secondary school chemistry. For prospective teachers of chemistry. (Same as EDSE 492).

CHEM 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

CHEM 499 Undergraduate Research (3)
PR: Consent of instructor. May be repeated for credit.

CIVIL ENGINEERING & ENVIRONMENTAL SCIENCES

CEES 221 Surveying (3)
CR: MATH 121. Theory and field practice in engineering, geological and land surveys. Two lectures, three hours laboratory.

CEES 321 Engineering Geology (3)
PR: ENGR 152 or equivalent. Physical geology with special emphasis on structural geology, ground water, soil genesis, and relation of geology to problems in soil mechanics. Two lectures, three hours laboratory.

CEES 351 Structural Mechanics (4)
PR: ENGR 312. Determinate and indeterminate analysis of structural elements, influence diagrams and effects of moving loads.

CEES 361 Transportation Engineering (3)
PR: ENGR 342. Elementary investigation of all forms of transport–highway, rail, water, air. Systems approach to planning, design, construction, operation, and administration of transportation networks.

CEES 371 Urban Planning (3)
PR: ENGR 342 and 371. History and principles of planning; contemporary urban problems; current urban planning techniques.

CEES 411 Environmental Engineering (3)
PR: ENGR 361. Man's environment, water resources, hydrologic cycle, chemistry of natural water, quality requirements and water treatment, water distribution systems.

CEES 412 Environmental Engineering (3)
PR: ENGR 361. Man's environment, the carbon cycle and biochemistry of wastes, principles of waste treatment, drainage systems.

***CEES 414 Sanitary Systems Design (3)**
PR: CEES 411 or 412 and CEES 481. Planning capacity, and design of water distribution and domestic and storm drainage systems.

CEES 415 Atmospheric Pollution (3)
PR: CEES 411 and 413. Atmospheric composition and dynamics; origins and chemistry of contamination and biological significance; engineering methods of measurement and control.

CEES 431 Soil Mechanics (3)
PR: CEES 321 and ENGR 312. Index properties and engineering characteristics of soils. Compaction, shear, compressibility, and permeability. Two lectures, three hours laboratory.

***CEES 433 Site Foundation Engineering (3)**
PR: CEES 431. Geological investigations for engineering purposes, case histories, interpretation of geologic maps, major aspects of geologic structure, weathering, river mechanics, glacial deposits, eolian deposits in the site location for an engineering structure.

***CEES 443 Continuum Mechanics (3)**
PR: ENGR 312; CR: EMCS 411. Cartesian tensors. Stress and deformation in a continuum. Physical laws – Eulerian form; applications to solids and fluids.

CEES 451 Structural Design (3)
PR: CEES 351. Design of steel and reinforced concrete structural members. Two lectures, three hours laboratory.

***CEES 461 Transportation Engineering (3)**
PR: CEES 361. Advanced topics in transportation system analysis.

CEES 462 Traffic Engineering (3)
PR: CEES 361. Study of operator and vehicle characteristics, street capacity, signals, signs and markings, etc. All phases of traffic engineering as applied to urban areas.

***CEES 471 Urban Planning (3)**
PR: CEES 371. Municipal organization and administration, public health, public utilities, services, zoning, replanning, critical studies.

CEES 481, 482 Water Resources Engineering (3, 3)
PR: ENGR 332 and 361. Engineering systems for development, utilization

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and control of water resources. Physical hydrology, economic analysis, case studies.

CEES 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

CEES 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

COMMUNICATIONS

COM 100 Basic Communications (3)
Survey of basic factors affecting human interaction through communication; theories and models of communication; contributions of behavioral sciences and related arts; mass media in society.

COM 103 Training the Speaking Voice (3)
Basic principles of diction, voice, development, and interpretation; intensive practical application through classroom exercises and special projects designed to meet individual vocal needs and professional objectives.

COM 201 Business and Professional Communication (3)
Investigation of the basic principles of communication as applied to business with emphasis on the written and oral communicative acts.

COM 210 Evolution of the Mass Media in America (3)
Development of the mass media; social, economic, and political factors that have contributed to change.

COM 300 Communication Theory as Related to the Mass Media (3)
Comparative study of views and theories of communication through the print and spoken media; theories of perception and communication; information and recall involving printed media, public platform, and electronic media.

COM 301 Social, Ethical, and Legal Responsibilities of the Mass Media (3)
Social and ethical responsibilities; legal rights and restrictions, including

Constitutional guarantees, libel, invasion of privacy, and contempt of court.

COM 305 The Art of Criticism (3)
PR: Consent of instructor. Development of the bases of criticism from literary, rhetorical, and dramatic formats; application of the bases of criticism in written, oral and artistic critiques, including criticism of performance.

COM 400 Motivation and the Mass Media (3)
Use of mass media to achieve motivation from various publics; theory and nature of specialized media to gain rapport with and reaction from selected groups.

COM 401 Communicative Process in Government (3)
PR: Consent of instructor. Creation of public opinion on issues, candidates, governmental policies in the struggle for power; use of communication in democratic processes.

COM 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

COM 499 Undergraduate Research (3)
PR: Consent of instructor. May be repeated for credit.

COMPUTER SCIENCE

COMP 101 Introduction to Computer Science (3)
History of computers; description of a typical computer; computer elements and symbology; number systems; basic arithmetic operations; computer control and data flow; peripheral components; memory devices; problem solving using a programming language; case study of a non-trivial application of computers; economic, political, sociological, and other implications of computers, computer science, and computer technology.

COMP 102 Computer Programming (3)
Digital computer programming and its application to the numerical solution of elementary engineering and scientific problems.

COMP 201, 202, 203 Algorithms and Programming (3, 3, 3)
PR: COMP 101 or COMP 102. Problem definition and solutions; notion of an algorithm; algorithmic representations; an introduction to (1) machine-oriented languages, (2) scientific programming languages (FORTRAN and ALGOL), and (3) a business-oriented language (COBOL); definition and use of functions, subroutines, and procedures; applications. During the

third quarter of this sequence, the student will be assigned a major problem for analysis and solution.

COMP 301, 302, 303 Data Structures (3, 3, 3)
PR: COMP 203. Basic concepts of data; linear lists, strings, arrays, and orthogonal lists; representation of trees and graphs; storage systems and structures, and storage allocation and collection; multilinked structures; symbol tables and searching techniques; ordering or sorting techniques; formal specification of data structures, data structures in programming languages, and generalized data management systems; recursion; string and list processing languages (such as SNOBOL and LISP); data structures of COBOL and PL-1; compiler design and implementation.

COMP 401 System Design (3)
PR: COMP 303. Processor characteristics; peripheral equipment characteristics; information representation; zero-, single-, and multi-address processing; memory utilization; batch processing; paging and overlay; addressing schemes; control functions; input and output characteristics; and an introduction to data communications.

COMP 411 Operating Systems (3)
PR: COMP 401. Task scheduling; file management; file security; multiprogramming; communication between system components; system logs and accounting; and status reporting.

COMP 421 Compiler Structure (3)
PR: COMP 401. A review of the major problem-oriented languages; syntax analysis; bootstrapping techniques and meta-compilers; languages for compiler writing; storage allocation and mapping; dynamic allocation; scanners; symbol tables; code emitters; one-pass and multi-pass systems; code optimization.

***COMP 461, 462, 463 Numerical Analysis (3, 3, 3)**
PR: COMP 203, MATH 211, and MATH 221; or consent of instructor. Numerical solution of algebraic and transcendental equations, systems of equations, ordinary and partial differential equations, and integral equations; interpolation; finite differences; eigen-value problems; relaxation techniques; approximations and error analysis.

***COMP 471, 472, 473 Mathematical Programming (3, 3, 3)**
PR: COMP 203, MATH 211, and MATH 221; or consent of instructor. Linear, nonlinear, and dynamic programming; linear inequalities; theory and application of methods for determining the maximum and minimum of functions of many variables subject to constraints; special techniques for solving integer programming problems; Simplex Method and variants;

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gradient methods; applications in business, science, and engineering.

COMP 481, 482, 483 Computer Processing of Statistical Data (3, 3, 3)
PR: MATH 221, STAT 402, and COMP 101 or COMP 102; or consent of instructor. The use of high-speed electronic computers in statistical analysis; approximation methods; error analysis; Monte Carlo calculations; simulation; combinatorial problems; matrix calculations; least squares analysis; multiple regression; stepwise regression; non-linear estimation; characteristic value problems; principal component analysis; factor analysis; analysis of variance and covariance computations.

***COMP 487, 488, 489 Computer Processing of Business Data (3, 3, 3)**
PR: Junior standing and COMP 101 or COMP 102. The use of high-speed electronic computers for business data processing; COBOL; applications in accounting, payroll, inventory control, and production control; file organization, development, and control; sequential and random processing methods; exception reporting; on-line and off-line systems and controls; PERT, CPM, and management games; advanced data systems and processing techniques.

COMP 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

COMP 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ECONOMICS

ECON 201 Principles of Economics (3)
The nature and method of economics. National income measurement, determination, and stabilization, including an analysis of the money and banking system.

ECON 202 Principles of Economics (3)
PR: ECON 201. The functioning of the market system in the determination of product prices.

ECON 203 Principles of Economics (3)
PR: ECON 202. The functioning of the market system in the determina-

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tion of factor prices. Consideration of the problems of agriculture, economic development, international trade, and labor.

ECON 301 Intermediate Price Theory (5)
PR: ECON 203. Theoretical analysis of the determination of product and factor prices under different market structures.

ECON 311 Intermediate Money, Income and Employment Theory (5)
PR: ECON 203. Theoretical analysis of the determination of national income and employment, including an examination of the monetary system.

ECON 321 Business and Economic Statistics (4)
PR: ECON 203, MATH 105 and STAT 201. The use of statistical methods as scientific tools in the analysis of economic and business problems. Emphasis is placed on the collection, analysis, and interpretation of quantitative economic and business data. (Same as STAT 321).

ECON 331 Economics of Labor (3)
PR: ECON 203. A survey of the growth, structure, objectives, and collective bargaining practices of organized labor groups.

ECON 341 International Economics (3)
PR: ECON 203. Fundamental principles of international trade and foreign exchange, including the balance of payments and problems of foreign economic policy.

ECON 351 Economic History of the United States (3)
PR: ECON 203. An analysis of the historical growth and development of the American economy.

***ECON 361 Economics of Agricultural Production, Pricing, and Policy (3)**
PR: ECON 203. The application of economic analysis to the agricultural sector of the economy.

ECON 371 Mathematical Economics (3)
PR: ECON 203 and MATH 123. An introduction to the mathematical tools of modern economic analysis.

ECON 381 Economics of Public Utilities (3)
PR: ACCY 103 or 307 and ECON 203 or consent of instructor. The nature of public utilities, the economics of rate determination, and regulatory policy.

ECON 401 Managerial Economics (5)
PR: ECON 203. The uses of economic analysis in economic decision-making and business policy formulation.

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ECON 411 Comparative Economic Systems (3)
PR: ECON 203. An analysis of the fundamental institutions of the American economic system and a comparison of the American economic system with other economic systems.

ECON 421 Economic Statistical Analysis (5)
PR: ECON 321. Concepts and methods of developing, analyzing, and interpreting measures of economic activity and business and economic change.

ECON 431 Public Finance (3)
PR: ECON 203. Government finance at the federal, state, and local levels, with special attention to principles of taxation and problems of tax administration.

ECON 441 Economic Development (3)
PR: ECON 203. The processes and problems of economic development.

ECON 451 Econometrics (3)
PR: ECON 371 and ECON 421. Application of modern statistical methods to economic theory and problems.

***ECON 461 Business and Government (3)**
PR: ECON 203. A survey of the most significant public policies affecting business firms.

ECON 471 History of Economic Thought (5)
PR: ECON 203. A study of the leading ideas of the major contributors to the development of economic thought.

ECON 481 Economics of Urban Areas (3)
PR: ECON 203. An analysis of the economic problems arising from and associated with the growth of cities and suburban areas within metropolitan districts.

ECON 499 Undergraduate Research (2-5)
PR: Consent of Instructor. May be repeated for credit.

ELECTRICAL ENGINEERING & COMMUNICATION SCIENCES

EECS 311 Switching Theory (3)
PR: ENGR 321. Logical functions. Theory and application of Boolean algebra. The minimization of logical expression and networks including NAND and NOR logic.

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EECS 321 Electrical Networks (3)
Continuation of ENGR 322.

EECS 322 Electronic Engineering (3)
Continuation of ENGR 323. Three lectures, three hours laboratory.

EECS 331 Electromechanics (3)
PR: ENGR 322. Energy conversion by electromechanical methods.

EECS 341 Electromagnetic Fields (3)
PR: ENGR 322. Introduction to fields and waves.

EECS 411 Logical Component Design (3)
PR: EECS 311. Theory of number systems and arithmetic. Sequential circuit theory. Design and application of serial and parallel logical components including counters, registers, adders and subtractors. Principles of stored program computers.

***EECS 412 Logical Systems Design (4)**
PR: EECS 411. Systems investigation, Design, and Operation of Digital Computers; Study of A Basic Hardware Set and A Basic Software Set. Three lectures, three hours laboratory.

EECS 413 Digital Systems and Circuits (4)
PR: ENGR 323 and EECS 311. Investigation of digital components and their incorporation into circuits for digital applications. Three lectures, three hours laboratory.

EECS 414 Analog Computers (3)
PR: EECS 321. Theory, operation and application of analog computers.

***EECS 421 Electrical Networks (3)**
PR: EECS 321 and 341. Traveling electromagnetic waves with application to distributed parameters. Two lectures, three hours laboratory.

***EECS 431 Electrical Machinery (3)**
PR: EECS 331. Methods and techniques of systems analysis applied to the dynamics of electrical machinery. Two lectures, three hours laboratory.

EECS 442 Microwaves (4)
PR: EECS 341 and 421. Microwave devices and systems. Three lectures, three hours laboratory.

***EECS 443 Coherent Optics Applications (3)**
PR: EECS 341. Theory and design of coherent optical systems, lasers, information, processing, communications, bolography.

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EECS 451 Communication Theory (4)
PR: EECS 321 and 322. Information transmission, modulation, and noise. Three lectures, three hours laboratory.

***EECS 453 Random Processes (3)**
PR: MATH 221 and ENGR 321. Random variables, averaging, sampling, elements of probability theory.

EECS 461 Semiconductor Devices (3)
PR: EMSC 411. Semiconductors with non-uniform impurity distribution; impurity diffusion, analysis of drift transitor with constant built-in field. Junction field-effect transistors. Two lectures, three hours laboratory.

EECS 462 Solid State Systems (3)
PR: EECS 461. Selection and use of device models in system analysis.

***EECS 464 Solid State Electronics (3)**
PR: EECS 461. Theory of solid state devices.

EECS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 498 Undergraduate Seminars (2-5)
PR: Consent of instructor. May be repeated for credit.

EECS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ELEMENTARY EDUCATION – Developmental

EDEL 301 Mathematics Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Analysis of teaching arithmetic, geometry and measurement; philosophy and objectives; instructional materials; current research and new curricula.

EDEL 302 Teaching Mathematics in the Elementary School (3)
PR: EDEL 301. Consideration of selected concepts; organizing for instruction, techniques and activities; class and individual diagnosis; remedial procedures.

EDEL 305 Language Arts in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Content, principles,

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materials and techniques involved in teaching, speaking, listening, writing, and spelling in the elementary school; organizing for instruction.

***EDEL 306 Music in the Elementary School (3)**
Fundamental procedures for teaching elementary school music, stressing appropriate music materials and activities for different age groups; selected experiences in music.

EDEL 307 Literature for Children (3)
PR: Admission to Phase II or consent of instructor. General survey of books and materials; criteria for analysis and evaluation; types of books available considered in terms of interests, needs, and abilities of children.

EDEL 311 Basic Foundations of Reading (3)
PR: Admission to Phase II or consent of instructor. Introduction to reading, principles, procedures and organization, current practices; analysis of reading materials; correlation with child development; investigation of research.

EDEL 312 Reading in the Elementary School (3)
PR: EDEL 311. Study of specific techniques and materials used to develop reading comprehension, vocabulary and rate; organizing and directing a reading lesson; individual differences; evaluation procedures.

EDEL 315 Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in natural sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDEL 316 Elementary School Curriculum (3)
PR: Admission to Phase II. Basic scope and sequence of the elementary school curriculum; philosophical concepts; techniques and materials for instruction; patterns of organization; planning for instruction.

EDEL 317 Social Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in the social sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

***EDEL 401 Programs in Early Childhood Education (3)**
PR: Admission to Phase II or consent of instructor. Overview of the philosophy, content, facilities, instructional materials, and activities appropriate for children ages 3, 4, and 5; current research and new curricula. Concurrent laboratory experiences.

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***EDEL 402 Developmental Processes in Early Childhood (3)**
PR: Admission to Phase II or consent of instructor. Developmental processes and their relationship to learning and curriculum development; influence of the family and culture.

***EDEL 403 Language and Cognition of Young Children (3)**
PR: Admission to Phase II or consent of instructor. Language in the learning, patterns of thinking, and perceiving of young children. Theories of language and symbolic experience, verbal and non-verbal behavior.

***EDEL 404 Organization of Instruction in Nursery–Kindergarten Education (3)**
PR: Admission to Phase II or consent of instructor. Organization of instruction; selected themes and concepts; teaching procedures; evaluation techniques; special problems. Concurrent laboratory experiences.

EDEL 405 Problems in the Teaching of Elementary School Language Arts (3)
Study of special problems in teaching spelling, handwriting, creative and functional writing, grammar usage, and oral expression; language and cognition processes; current research and trends.

***EDEL 406 Art in the Elementary School (3)**
Basic principles, purposes, scope and sequence; organization for instruction; evaluation of activities; selected art experiences.

EDEL 407 Diagnosis and Treatment of Reading Difficulties (3)
PR: EDEL 311 and 312. Principles and techniques of diagnosis and remedial teaching with the disabled reader; factors related to reading problems – physiological, psychological, cultural; materials for instruction.

EDEL 408 Teaching Science in the Elementary School (3)
PR: EDEL 315. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

EDEL 409 Teaching Social Science in the Elementary School (3)
PR: EDEL 317. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

***EDEL 415 Teaching Elementary School Health and Physical Education (3)**
PR: Admission to Phase II or consent of instructor. Observation, organization, practice, and conduct of health and physical education activities in the elementary school.

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EDEL 455 Elementary School Curriculum (4)
PR: Bachelor's degree or consent of instructor. Advanced study of the elementary school curriculum; patterns of organization; school services; individual subject areas; school related activities; investigation of trends; research and new curricula.

EDEL 456, 457 Directed Study in Elementary Education (5, 5)
Workshop for the improvement of the elementary school curriculum. Open to in-service teachers.

ENGINEERING CORE

ENGR 101 Engineering Graphics (2)
Engineering drawing, descriptive geometry, and graphical solution techniques. Current practices of industry. One lecture, two hours laboratory.

ENGR 102 Engineering Graphics (2)
Spatial visualization, sketching, and graphical presentations as engineering communications. One lecture, two hours laboratory.

ENGR 103 Creative Design (2)
PR: Approval of instructor. Role of the engineer as a creative design professional. Emphasis on understanding the creative process and factors that influence it. Attitudes and viewpoints of the designer and an investigation of the techniques of analysis, synthesis, and evaluation used. One lecture, two hours recitation and laboratory.

ENGR 111, 121, 131 Engineering Concepts Laboratory (1, 1, 1)
PR: Approval of instructor. Lecture-demonstrations of the basic physical phenomena essential to the understanding of engineering structures, machines, processes, and systems. Primary emphasis on (1) mechanical components and microscopic materials behavior, (2) electrical phenomena, (3) thermo-fluid mechanics phenomena. Two hours lecture-demonstration.

ENGR 151, 152 Chemical Foundations of Engineering (3, 3)
PR: Satisfactory performance in one year of high school chemistry and one year of high school physics or other natural science or CHEM 111; CR: MATH 121. Atomic and molecular structure, crystal structure, metallic phases and their properties, organic materials and their properties, equilibrium relationships, reaction rates, phase transformations, composite materials. Lecture, demonstration, and recitation.

ENGR 201, 202, 203 Engineering Design Case Studies (1, 1, 1)
PR: Sophomore standing and ENGR 103. A discussion of the role of various engineering disciplines in the creative design process. Invited guest

speakers will review pertinent case studies. Primary emphasis on (1) mechanical engineering-aerospace sciences projects, (2) civil engineering-environmental sciences projects, and (3) electrical engineering-communication sciences projects. Attention will be given to engineering administration, systems, and materials throughout. Two hours lecture discussion.

ENGR 211 Engineering Analysis–Statics (4)
CR: MATH 221. Force systems, resultants, equilibrium, distribution forces. First and second moments of areas and masses.

ENGR 221 Electrical Science (4)
PR: MATH 221 and ENGR 311. Basic concepts of electricity and magnetism. The development of fundamental laws and their engineering application. Lecture, demonstration, and laboratory.

ENGR 311 Engineering Analysis–Dynamics (4)
PR: ENGR 211. Kinematics and Kinetics of particles, moving coordinate systems. Dynamics of systems of particles and rigid bodies.

ENGR 312 Mechanics of Materials (5)
PR: ENGR 311; CR: MATH 331. Concepts of stress and strain, Hooke's Law: strength and deflection of axial force members, shafts in torsion and beams in flexure; combined stress; stability of columns. Lecture, demonstration and laboratory.

ENGR 321 Principles of Electrical Engineering (4)
PR: ENGR 221; CR: MATH 331. Introduction to fundamental laws of electrical circuits, network analysis, magnetic properties, electromagnetic interaction, magnetic and electric fields, and electrical and magnetic properties of solids. Lecture, demonstration, and laboratory.

ENGR 322 Electrical Networks (4)
PR: ENGR 321. Mathematical analysis of networks and linear systems. Lecture, demonstration, and laboratory.

ENGR 323 Electronic Engineering (4)
PR: ENGR 322. Electronic circuits. Lecture, demonstration , and laboratory.

ENGR 331 Thermodynamics (4)
PR: MATH 331 and ENGR 312. Work, heat and energy transformations. Relation of properties. Laws, concepts and modes of analysis common to all applications of thermodynamics in engineering.

ENGR 332 Fluid Mechanics (4)
PR: ENGR 331. Basic principles of continuum fluid mechanics and transport concepts. Lecture, demonstration , and laboratory.

ENGR 341 Engineering Economic Analysis (3)
PR: MATH 121. Economic evaluation of engineering alternatives.

ENGR 342 Systems Analysis (3)
PR: ENGR 341; CR: ENGR 371. Integrated systems approach to the analysis, design, and optimization of engineering hardware and software.

ENGR 351 Structure & Properties of Materials (3)
PR: ENGR 312 and 331. Quantum mechanical introduction to atomic bonding. Classification of solids. Crystal structures and the diffraction of X-rays by crystals. Effects of imperfections on physical properties.

ENGR 352 Materials of Engineering (3)
PR: ENGR 351. Properties and behavior of engineering materials. Laboratory investigations and text criteria. Lecture demonstrations and laboratory.

ENGR 361 Man and His Environment (3)
PR: ENGR 152 or equivalent. Man's interaction with the air, water, and land environment in which he lives. The role of engineering in control of the physical environment for the benefit of mankind.

ENGR 371 Probability and Statistics for Engineers (3)
PR: MATH 221. 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 345).

ENGR 431 Transport Processes (3)
PR: ENGR 332. Analogous development and application of the principles of viscous fluid flow, conduction and convective heat transfer, and mass diffusion processes.

ENGR 441 Technical Communications (3)
PR: Junior standing. Composition for technical papers, reports and scientific articles suitable for publication. Oral and written presentation.

ENGR 442 Operations Research (3)
PR: ENGR 371. Mathematical methods of Operations Research; linear programming.

ENGR 443 Engineering Administration (3)
PR: Senior standing. Engineering organization and administration; delegation of authority and responsibility; effective utilization of resources; compensation structure, labor-management relations.

INTERDISCIPLINARY COURSES

ENGR 481 Man and Machine (3)
The influence and inter-relationship of invention and technical progress on the evolution of social forms and institutions.

ENGR 482 Engineering & Technology in History (3)
Important developments in engineering and technology and their effect on society and our socio-economic processes and institutions.

ENGR 483 Technology and Social Change (3)
Review of existing theories of social change, analysis of the role of technology as related to social change, and study of contemporary events in technology and their possible impact on society.

***ENGR 484 Science in History (3)**
Examination of the reciprocal relations of science and society from ancient to recent times.

***ENGR 485 Topics in Urban Development (3)**
Production, distribution, and consumption of various commodities and engineering relationships to distribution, internal structure, and function of urban developments. Inter-relationship of engineering, social, economic, and cultural phenomena.

***ENGR 486 Science, Engineering, and Ethical Systems (3)**
A study of the contributions of science and engineering to society in light of moral, social, and ethical principles. A systematic and critical consideration of representative ethical problems created by advancing technology.

ENGINEERING MATERIALS SCIENCES

EMS 411 Semiconductor Materials and Devices (3)
PR: EECS 341 and ENGR 351. Electrical conduction in semiconductors; basic concepts of drift, diffusion, carrier generation and recombination. Physical theory and models for the junction diode and transistor. Representation in terms of linear incremental and non-linear charge control models.

EMS 412 Electronic Properties of Materials (3)
PR: ENGR 351. Electronic processes in solids. Electrical, magnetic and

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optical properties of solids. Electron energies in solids. Superconducting materials.

EMS 413 Thermodynamic Properties of Materials (3)
PR: ENGR 351. Fundamental concepts of thermodynamics and kinetics are applied to the study of solid state phase transformations, equilibrium in multi-component systems and diffusion in solids.

***EMS 421 Theory of Crystalline Solids (3)**
PR: ENGR 351. Modern theory of crystalline materials. Topics treated include crystal structure, mechanical, thermal and transport properties.

EMS 431 Engineering Materials and Processes (3)
PR: Senior standing. Basic properties and metallurgy of engineering materials including ferrous and non-ferrous metals and alloys; studies of cermets and plastics; production and processing of engineering materials. Two lectures, three hours laboratory.

EMS 432 Metallurgy (3)
PR: EMSC 431. Extraction of metals, crystal and atomic structure, phase transformations, tests and properties of high temperature metals and refractories, and introduction to spectroscopy. Two lectures, three hours laboratory.

***EMS 441 Materials Processing (3)**
PR: ENGR 331. Phase transformations, crystallography, growth processes, kinetics of solid state transformations; technology of high and low temperatures, vacuum systems, high pressure, and clean environments.

EMS 451 Mechanical Properties of Materials (3)
PR: ENGR 351. Fundamentals of mechanical behavior of engineering materials. Selected topics include fracture, creep, fatigue, and microscopic interpretation of results of mechanical testings.

***EMS 452 Engineering Materials (3)**
PR: ENGR 351. Engineering testing methods for materials in common use in construction applications. Properties of structural alloys, concrete, asphalt, plastics and interpretation of test results.

EMS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

EMS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

EMS 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

*May not be offered before 1970.

EMS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGINEERING MATHEMATICS AND COMPUTER SCIENCES

EMCS 311 Engineering Mathematical Analysis (3)
PR: MATH 211. Advanced topics in mathematical analysis of importance in modern engineering, including vector algebra, vector calculus and Fourier series.

EMCS 341, 342 Computer Methods and Applications (3, 3)
The use of analog and digital computers in engineering and data processing. Methods of structuring problems for computers; general characteristics and performance measures of computers and auxiliary equipment. The analog-digital interface. Case studies. Laboratory assignments.

EMCS 411 Engineering Mathematical Analysis (3)
PR: MATH 331. Vector approach to functions of several variables, curvilinear coordinates, Jacobians and implicit functions, multiple integrals, line and surface integrals.

EMCS 412 Analytical Methods in Engineering (3)
PR: EMCS 411 and approval of instructor. Complex variables with application to problems in engineering: analytic functions, integrals, power series, conformal mapping, application of conformal mapping to problems in fluid flow heat transfer, and electric potential.

***EMCS 413 Analytical Methods in Engineering (3)**
PR: EMCS 311. Solutions of partial differential equations with application to the initial and boundary value problems of engineering. Classification: parabolic, hyperbolic and elliptic equations. Separation of variables, transform techniques, methods of characteristics.

EMCS 423 Mathematics Review for Engineers (5)
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. Not usable for degree credit.

EMCS 431 Probability for Engineers (3)
PR: ENGR 371. Combinatorial analysis, sample space, events, probability, discrete and continuous random variables, probability distributions with applications in engineering. (Same as STAT 435).

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***EMCS 432 Statistics for Engineers (3)**
PR: ENGR 371. Significance tests and confidence intervals, tests of hypotheses, simple and multiple regression and correlation with applications in engineering. (Same as STAT 436).

***EMCS 433 Queueing Theory (3)**
PR: ENGR 371. Analysis of queues using analytical and Monte Carlo methods.

EMCS 451 System Simulation with Digital Computers (3)
PR: EMCS 341 and 432. Methods and procedures for simulating large scale systems with digital computers. FORTRAN and GASP programming languages are used. Laboratory assignments.

EMCS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

EMCS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

EMCS 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

EMCS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

ENGLISH

ENG 101 Composition I (3)
Expository writing, with emphasis on effective communication. Grammar and mechanics will not form a major part of this course; if the student is deficient, he will achieve proficiency through independent study. Writing topics to be based on selected readings.

ENG 102 Composition II (3)
PR: ENG 101 or equivalent. Writing practice involving the mechanics of research and evaluation of varied readings. A documented paper will demonstrate the student's grasp of writing principles studied.

ENG 103 Current Literature (3)
PR: ENG 101 or equivalent. Contemporary prose and poetry selected to invite the interest of students in literature. Writing related to readings.

Note on the Freshman English Program:
ENG 101, 102, and 103 may be taken to satisfy the six semester-hour

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requirement for certification in secondary school teaching or for transfer to colleges that have this requirement. Students who intend to major in English, English Education, or Library Science should take ENG 102 and 103.

ENG 201 Expository Writing I (3)
For students who have completed ENG 101 and/or ENG 102 who have been exempted from ENG 101; also for students who desire more practice in expository writing.

ENG 202 Creative Writing I (3)
PR: ENG 101, 102, or equivalent, or approval of the instructor. Narrative or other forms of imaginative writing for students who demonstrate promise in writing.

ENG 210 Principles of Literature (3)
Literary terms, forms, and types, illustrated in a wide variety of readings.

ENG 211 Survey of English Literature to 1625 (3)
Survey of important authors, works, and literary trends from Beowulf to Bacon.

ENG 212 Survey of English Literature, 1626-1798 (3)
Survey of important authors, works, and literary trends from Donne to Boswell.

ENG 213 Survey of English Literature, 1798-1914 (3)
Survey of important authors, works, and literary trends from Wordsworth to Hardy.

ENG 301 Professional Report Writing (3)
PR: ENG 101 or equivalent. For scientific, professional, or business students. The first half of the course lays emphasis on clear expository writing; the second half involves an expert in the student's field, who reads papers, consults, and advises on problems in writing in a particular discipline.

ENG 311 Survey of American Literature to 1865 (3)
Literature in English written in America from 1588 to the Civil War, with major attention to writers of the first half of the 19th Century: Irving, Cooper, Bryant, Poe, Emerson, Thoreau, Hawthorne, and Melville.

ENG 312 Survey of American Literature, 1865-1914 (3)
American writers from the Civil War to World War I: Whitman, Dickinson, the rise of the short story, Mark Twain, Howells, James, the Naturalists, and the social critics.

ENG 313 Survey of American Literature Since 1914 (3)
American poetry, drama, fiction, and essays by such writers as Robinson, Frost, Sandburg, Pound, Eliot, O'Neill, Faulkner, Hemingway, and Steinbeck, as well as living authors.

ENG 314 Survey of English Literature Since 1914 (3)
British writers from Yeats to Dylan Thomas, involving consideration of all literary forms.

***ENG 316 Continental European Fiction Since 1900 (3)**
A selection of significant works of fiction written in various languages during the present century, read in translation.

***ENG 361 Practical Criticism (3)**
Analysis of approaches to the evaluation of literature in the works of modern critics, leading to student exercises in criticism of selected fiction, poetry, and drama, based on the principles of critics studied.

ENG 371 General Linguistics (3)
PR: ENG 101 or equivalent. Basic linguistic concepts and an introduction to historical, descriptive, comparative, and applied linguistics. Useful for students in Secondary Education as well as majors in English.

ENG 401 Expository Writing II (3)
PR: Advanced standing, superior writing demonstrated in a lower level writing course, or consent of the instructor.

***ENG 402 Creative Writing II (3)**
PR: Superior writing ability demonstrated in an earlier creative writing course or the equivalent, and consent of the instructor. Extensive writing practice under supervision, leading to a completed body of work in fiction, nonfiction, drama, or poetry.

ENG 421 Studies in 17th Century English Literature (3)
Prose, poetry, and drama (exclusive of Shakespeare) in the age of Bacon, Donne, and Ben Jonson.

ENG 422 Studies in 17th Century English Literature (3)
Literature of the Puritan domination: Milton, Browne, Taylor, Walton, the furtive drama of Davenant.

ENG 423 Studies in 17th Century English Literature (3)
Literature of the Restoration period: Dryden, Pepys, Bunyan; Restoration comedy, tragedy, and heroic plays; Locke, Newton.

ENG 424 Studies in 18th Century English Literature (3)
Selected works of Defoe, Swift, Addison, Steele, Pope, and other writers

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of the first 40 years of the 18th Century.

ENG 425 Studies in 18th Century English Literature (3)
The rise of the English novel and the "age of Johnson."

ENG 426 Studies in 18th Century English Literature (3)
Preromantic writers, Thomson, Gray, Collins, Cowper; the shift from Reason to Feeling; the approach to the Romantic Revolt in Burns and Blake; the Gothic novel and the novel of manners.

ENG 427 Studies in 19th Century English Literature (3)
The Romantic Triumph in poetry and prose: Wordsworth, Coleridge, Byron, Shelly, Keats, Lamb, Hazlitt, De Quincey, Scott.

ENG 428 Studies in 19th Century English Literature (3)
English literature from 1832 to 1870. The early Victorians: Carlyle, Macaulay, Ruskin, Arnold, Tennyson, Browning, Dickens, Thackeray, George Eliot.

ENG 429 Studies in 19th Century English Literature (3)
English literature from 1870 to 1914. Later Victorians and transitional writers: Swinburne, Pater, Wilde, Huxley, Butler, Stevenson, Housman, Hardy, Conrad.

ENG 430 Chaucer (3)
The Canterbury Tales and shorter works.

ENG 431 Shakespeare's Comedies (3)

ENG 432 Shakespeare's Histories (3)

ENG 433 Shakespeare's Tragedies (3)

ENG 434 Milton (3)
Paradise Lost and shorter poems, together with selected prose.

ENG 451 British and American Fiction Since 1900 (3)
Maugham, Aldous Huxley, Lawrence, Joyce, Lewis, Hemingway, Faulkner, Wolfe, Steinbeck.

ENG 452 British and American Poetry Since 1900 (3)
Yeats, Auden, Spender, Thomas, Robinson, Frost, Sandburg, Pound, Jeffers, Eliot, Cummings, and some living poets.

ENG 453 British and American Drama Since 1900 (3)
Yeats, Synge, O'Casey, Shaw, Eliot, O'Neill, Williams, Wilder, and the experimental drama.

ENG 465 Literature for Adolescents (3)
Selecting and evaluating books for adolescents, with emphasis on the uses of books in the development of young people. Required for secondary school English teachers and students seeking certification in Library Science.

ENG 471 History of the English Language (3)
The morphology and phonology of the English language from Old English to modern English.

ENG 472 Modern English Grammar (3)
English etymology, parts of speech, inflection, syntax, and modern usage. Required for secondary school English teachers.

***ENG 473 English Linguistics (3)**
The phonology, morphology, and syntax of present day English as examined through modern linguistic methods.

ENG 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

***ENG 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

FINANCE

FIN 301 Finance (5)
PR: ACCY 103 and ECON 203. Fundamentals of obtaining and administering funds to meet short-term and long-term capital requirements.

FIN 311 Risk and Insurance (5)
PR: ECON 203 or consent of instructor. Principles and methods of risk reduction and specialization, with particular emphasis on insurance.

FIN 321 Investments (3)
PR: ECON 203 or consent of instructor. Principles of determining investment policy for individual and institutional portfolios.

FIN 331 Money and Banking (5)
PR: ECON 203 or consent of instructor. The nature of money, the functioning of the commercial banking system and its relation to the level of economic activity, and the activities of the Federal Reserve System and Treasury.

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FIN 411 Financial Institutions (3)
PR: FIN 301. The operation of financial institutions and an analysis of their role in the economy.

FIN 421 Security Analysis (5)
PR: FIN 301. The problems of selecting securities for various investment purposes.

FIN 431 Financial Management (3)
PR: FIN 301. Analytical techniques for dealing with financial problems and their application to corporate financial management.

***FIN 499 Undergraduate Research (2-5)**
PR: Consent of instructor. May be repeated for credit.

FRENCH

FRE 101 Elementary French Language and Civilization (3)
Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to French culture.

FRE 102 Elementary French Language and Civilization (3)
PR: FRE 101 or equivalent. Continuation of FRE 101.

FRE 103 Elementary French Language and Civilization (3)
PR: FRE 102 or equivalent. Continuation of FRE 102.

FRE 201 Intermediate French Language and Civilization (3)
PR: FRE 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading; and further study of French culture.

FRE 202 Intermediate French Language and Civilization (3)
PR: FRE 201 or equivalent. Continuation of FRE 201.

FRE 203 Intermediate French Language and Civilization (3)
PR: FRE 202 or equivalent. Continuation of FRE 202 with greater emphasis on French civilization from the Middle Ages to the present.

FRE 301 French Composition (4)
PR: FRE 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and

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controlled written compositions required.

FRE 303 French Conversation (4)
PR: FRE 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

FRE 311 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance.

FRE 312 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works of the seventeenth and eighteenth centuries.

FRE 313 Survey of French Literature (3)
PR: FRE 203 or equivalent. Main literary currents and works of the nineteenth and twentieth centuries.

FRE 401 French Phonetics and Diction (2)
PR: FRE 303 or equivalent. French phonology with emphasis on phonic groupings.

***FRE 422 Seventeenth Century French Theater (5)**
PR: FRE 312. Corneille, Racine, and Molière. A study of the life and principal works of the authors.

***FRE 431 French Literature of the Eighteenth Century (3)**
PR: FRE 312. The philosophical movement: Montesquieu, Vauvenargues, Voltaire, Diderot, Buffon.

***FRE 441 Nineteenth Century French Literature (3)**
PR: FRE 313. Romanticism.

***FRE 442 Nineteenth Century French Literature (3)**
PR: FRE 313. Realism and naturalism.

***FRE 443 Nineteenth Century French Literature (3)**
PR: FRE 313. Parnassianism and symbolism.

***FRE 451 Twentieth Century French Literature (5)**
Contemporary French drama & poetry.

***FRE 453 Twentieth Century French Literature (3)**
PR: FRE 313. Contemporary French novel.

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***FRE 497 Independent Study (2-5)**
PR: Consent of instructor. May be repeated for credit.

***FRE 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

GERMAN

GER 101 Elementary German Language and Civilization (3)
Designed to intitiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to German culture.

GER 102 Elementary German Language and Civilization (3)
PR: GER 101 or equivalent. Continuation of GER 101.

GER 103 Elementary German Language and Civilization (3)
PR: GER 102 or equivalent. Continuation of GER 102.

GER 201 Intermediate German Language and Civilization (3)
PR: GER 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of German culture.

GER 202 Intermediate German Language and Civilization (3)
PR: GER 201 or equivalent. Continuation of GER 201.

GER 203 Intermediate German Language and Civilization (3)
PR: GER 202 or equivalent. Continuation of GER 202 with greater emphasis on German civilization from the Middle Ages to the present.

GER 301 German Composition (4)
PR: GER 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled compositions required.

GER 303 German Conversation (4)
PR: GER 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

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HISTORY

HIST 201 Western Culture and Civilization (3)
An introduction to the rise of culture and civilization in the West, with emphasis on the ideas, institutions, literature, and art pertinent to the development of contemporary civilization. The development of man and society from the earliest times to the eve of the Renaissance.

HIST 202 Western Culture and Civilization (3)
Continuation of HIST 201. The process of change is analyzed as Europe evolves from its feudal-manorial state through the Renaissance and Reformation. The rise of modern science and the emergence of the Enlightenment are viewed in terms of continuing change culminating with the French Revolution and Napoleon.

HIST 203 Western Culture and Civilization (3)
Continuation of HIST 202. Beginning with the Romantic era, the influence of liberalism, nationalism, and modern industrialism upon political, social, economic, and intellectual life are examined. Special emphasis is given to the impact of conflicting ideologies, economic crises, and wars upon Western life.

HIST 311 American History (3)
An introduction to the culturally interrelated problems of American values and institutions, past and present. The historical basis of the evolving institutions of the United States is demonstrated in economic life, government, education, family life, and religion.

HIST 312 American History (3)
Continuation of HIST 311. A topical study of America's evolving political institutions in response to population growth, national wealth, and changing needs and demands in an age of science and technology. The urban-suburban revolution and its impact upon social stratification, the family, and educational and religious institutions and values are emphasized.

HIST 313 American History (3)
Continuation of HIST 312. The public and private sectors of the American mixed economy are examined. U.S. involvement in world affairs, economically, politically, and militarily, is surveyed with special emphasis upon the underdeveloped regions.

HIST 330 Latin American History: The Colonial Period (3)
A survey course in Latin American history to the beginning of the Wars of Independence in 1810. Included are a brief review of the Aztec, Mayan, and Inca civilizations; the voyages of discovery and the establishment of

Spanish and Portuguese settlements in the New World; the conquest of the Indian civilizations; an analysis of the social and political institutions of the Spanish and Portuguese empires in America, the impact of the Enlightenment, the American and French Revolutions, and the Napoleonic Wars upon Hispanic-America, culminating in the independence movement.

HIST 332 Latin American History: The 19th Century (3)
Continuation of HIST 330. The Wars of Independence are reviewed and the legacies of the wars and of the colonial period are examined in terms of the rise of military dictatorships and continuing instability. The histories of the various republics are traced to the end of the 19th Century.

HIST 333 Latin American History: The 20th Century (3)
Continuation of HIST 332. The emergence of a new nationalism in Latin America is noted and the reaction of the different countries to the economic crises of the 1930's is evaluated. Emphasis is given to the influx of new ideologies – fascism, nazism, and communism – and their success in this underdeveloped region is examined. The response of the United States to changing conditions in 20th Century Latin America is studied in some detail.

HIST 412 United States History: 1763–1789 (3)
The American Revolution, the progress of the war, and the establishment of the first national government under the Articles of Confederation. Although the military history of the Revolutionary War is surveyed, special attention is given to the reasons for the separation of the colonies from Great Britain.

HIST 413 United States History: 1789–1824 (3)
The Constitution, the Federalist decade, Jeffersonian Democracy and the Era of Good Feelings. The major theme of the course is the spread of democracy in the U. S. with an analysis of the political philosophies of the Constitution and the first political parties. Attention is also given to the War of 1812 and the Monroe Doctrine.

HIST 415 United States History: 1878–1918 (3)
The Agrarian Revolt, the Spanish-American War, and the Progressive Era. Two major trends are evaluated during this period: the new manifest destiny which spread the boundaries of the U. S. beyond the continent and the great drive for reform in agriculture, the cities, and at the national level.

HIST 416 United States History: 1918 to Present (3)
Post World War I prosperity and the Depression. World War II, the Cold War, U. S. global commitments and domestic problems.

***HIST 417 United States Diplomatic History (5)**
The foreign relations of the United States from the founding of the Republic to the present. The growth of the United States from colonial days to a world power at the end of the 19th Century and the effect of this development on its foreign policy is traced to the present time.

***HIST 430 Latin American History: The ABC Countries (5)**
A survey of the histories of Argentina, Brazil, and Chile from the colonial period to the present. The development of the three giants of South America from unimportant colonies to the beginning of their period of preeminence in South American affairs.

HIST 452 The Middle Ages and the Renaissance (5)
PR: HIST 201. The ideas and institutions of Medieval Europe and a study of the great cultural and intellectual achievements of the 15th and 16th Centuries in Italy and Northern Europe at the time of the waning of the Middle Ages. An examination is made of the rise of the territorial states and the effects of nationalism on the political and social structure of Europe.

HIST 455 The Age of the Reformation and the Enlightenment (5)
PR: HIST 202. Europe from the 16th Century to the 18th Century. The great religious reforms of the period are analyzed with emphasis on the Protestant and the Catholic Reformations. A study of the period of the absolute monarchs and the Enlightenment culminating in the French Revolution.

HIST 457 Modern Europe: 1789–1918 (5)
The French Revolution, the Napoleonic era, the Age of Metternich, and the emergence of Germany. The rise of nationalism with the unification of Italy and Germany. The increase of nationalism and the spread of imperialism in Europe is stressed and an analysis is made of the causes of World War I and the Russian Revolution.

HIST 459 Modern Europe: 1918 to the Present (3)
A review of European history from the Treaty of Versailles through the Cold War. The rise of Nazism and Fascism is examined in relation to the beginning of World War II and the current position of Europe in world affairs.

***HIST 462 Modern British History: 1485 to the Present (5)**
A review of British history under the Tudors, Stuarts, and the early Hanoverians. The development of the national state, the religious struggle, the increasing power of Parliament, overseas expansion, the wars of empire and the Napoleonic wars. Great Britain from the Napoleonic era to post-World War II.

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HIST 471 History of Russia to 1917 (5)
Russia from the 12th Century to 1917. Reflection of the early growth of the nation with emphasis on the great rulers. In addition, the culture of Russia is studied in terms of social structure, religion, economics, and literature. Russia from the Crimean War to the fall of the monarchy. The Great Reforms, the growth of radicalism, the Russo-Japanese War, the revolt of 1905, the Near Eastern question, World War I, and the fall of the Romanov dynasty.

HIST 473 History of the Soviet Union (3)
The Bolshevik Revolution, the establishment of firm communist control, the Stalin era, and World War II are stressed. Special attention is given to the emergence of the Soviet Union as a great world power after World War II and its consequences to the Western World.

HIST 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

HUMANITIES

HUM 301 Humanities (Western): Ancient Sources (3)
A survey of the origins of Western thought and its expression in the arts. Concerns the individual as a partial product of his past, which he must understand in his search for wholeness and identity.

HUM 302 Humanities (Western): Middle Ages and Renaissance (3)
A study of the medieval synthesis, the re-emergence of humanism, and the flowering of Renaissance art and literature. Considers the individual's demand for recognition as the vital impulse of the Renaissance.

HUM 303 Humanities (Western): Enlightenment to Modern Times (3)
A study of the ideological and scientific revolutions, their effect on the arts and on the quality of modern life. Concerns the individual's need to regenerate humanistic values in a technological age.

HUM 311 Non-Western Studies: Egypt and the Near East (3)
Concerned primarily with the life and thought of ancient civilizations as revealed through art and archaeology.

HUM 315 Non-Western Studies: The Far East (3)
The art, literature, and thought during periods of highest intellectual achievement. Not a chronological history.

HUM 319 Non-Western Studies: Russia (3)
Examines the distinctive mixture of cultural influences out of which

modern Russian art and thought have evolved. Some attention to the folk culture as well as to the well-developed arts of music, ballet, drama, and the novel.

HUM 351 American Studies: Indian and Latin Cultures (3)
A survey of the art and archaeological remains of Inca, Mayan, and Aztec civilizations followed by a study of later Indian and Spanish influences on Latin American music, art, and literature.

HUM 355 American Studies: 19th Century U. S. Culture (3)
Draws upon resources of the American Studies Association to present a unified view of U. S. history, literature, and thought.

HUM 356 American Studies: 20th Century U. S. Culture (3)
Continuation of HUM 355.

Area Courses in Humanities

The aim of the following courses is to concentrate on a fundamental human attitude, intention, or intellectual concept that can be found in various cultures and expressed in a variety of ways. Unlike chronological survey courses, they are meant to cut across time and geographical location to discover common human elemnts.

***HUM 421 Comparative Art: Religious and Mystical (3)**

***HUM 425 Comparative Art: Secular and Popular (3)**

***HUM 429 Comparative Art: Formal and Abstract (3)**
Concerned with the purposes and uses of art from ancient times to modern and in all parts of the world where examples may be found.

***HUM 441 Comparative Music: Sacred and Ritualistic (3)**

***HUM 445 Comparative Music: Folk and Exotic (3)**

***HUM 449 Comparative Music: Secular and Serious (3)**
Concerned with the diversity of styles that may be adopted for similar purposes in different societies. No attempt to insist upon mutually exclusive or pure categories.

***HUM 451 Comparative Literature: The Epic (3)**
The epic hero as a model of human ideals in various cultural settings.

***HUM 455 Comparative Literature: The Tragic View (3)**
Selected tragedies from Aeschylus to Arthur Miller, considers variations in

*May not be offered before 1970.

the tragic form, and notes evidence of the tragic view in philosophy and history.

***HUM 459 Comparative Literature: The Comic View (3)**
Selected comedies from Aristophanes to Ionesco, traces the changing concepts of comedy, and attempts to define a comic view of life.

***HUM 471 Comparative Religions of the World (5)**

***HUM 481 Comparative Philosophy: The search for Elemental Unity (3)**

***HUM 485 Comparative Philosophy: The Search for Otherness and Pure Being (3)**

***HUM 489 Comparative Philosophy: The Search for Methods of Knowing (3)**
Epistemology and the growth of scientific method.

HUM 490 Senior Seminar: Arts and Social Sciences in Human Affairs (2)
A study of the impact of the creative and the inquiring mind on the growth of modern society. The arts viewed as a significant force in the development of our society and the social sciences as an analysis of its individual and collective structure. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to the students in the College of Humanities and Social Sciences.

***HUM 491 Humanities Forum (2)**
An open discussion type course in which students from all areas are invited to participate. A selected topic will be discussed each week in a two-hour session. The student will be expected to inform himself through reading, but no extensive writing will be required.

***HUM 497 Independent Study (2-5)**
PR: Consent of instructor. May be repeated for credit.

***HUM 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

INDUSTRIAL ENGINEERING & MANAGEMENT SYSTEMS

IEMS 311 Engineering Law (3)
PR: Junior standing. Influence of contract, property, and tort law upon

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engineering activities; contracts, agency, partnerships, corporations, liens, and expert testimony.

IEMS 331 Work Analysis and Design (3)
PR: Junior standing or approval of instructor. Analysis, design and operation of work systems; their relationship to job evaluation and wage payment systems. Laboratory assignments.

IEMS 332 Statistical Quality Control (3)
Statistical concepts and methods applied to the control of quality of manufactured products. (Same as STAT 332).

IEMS 411 Industrial Administration (3)
PR: ENGR 443. Role of the engineer in manufacturing management. Basic functions, departmentation, authority relationships, and methods of control.

IEMS 421 Operations Research Models (3)
PR: EMCS 331. Inventory and replacement models, queueing theory, sequencing, forecasting, dynamic programming.

IEMS 422 Network Analysis (3)
PR: EMCS 331 and ENGR 442. Analysis of networks including: CPM, PERT, GERT, maximum flow problems.

IEMS 423 Analysis of Industrial Operations (3)
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 442 Engineering Economic Analysis (3)
PR: ENGR 341 and EMCS 331. The engineering economic audit, breakeven point analysis, variable budget control of manufacturing costs, cost analysis, and product pricing.

***IEMS 443 Analysis of Decision Processes (3)**
PR: ENGR 371 and ENGR 341. Methods of making economic decisions; effects of risk, uncertainty, and strategy on managerial economic decision.

IEMS 451 Human Engineering (3)
PR: Senior standing. Man-machine systems; design and conduct of human engineering studies. Laboratory assignments.

IEMS 452 Human Factors in Space Travel (3)
PR: IEMS 451. Artificial environments and environmental control of upper atmosphere and space.

*May not be offered before 1970.

***IEMS 462 Information Acquisition (3)**
PR: EMCS 331. The design of systems to collect data for use in managerial decision models, job evaluation, wage payment, production standards, queueing studies, engineering evaluations and reliability predictions.

IEMS 463 Project Engineering (3)
PR: Senior standing. Role of the project engineer in research and development, emphasizing the complete sequence of steps from project proposal to project completion. Analytical techniques such as CPM, PERT/COST will be considered.

***IEMS 464 Design of Industrial Operations (3)**
PR: IEMS 331. Planning, analyzing, controlling and evaluating production systems. Laboratory assignments.

IEMS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

IEMS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

JOURNALISM

JRN 220 Writing for the Mass Media (3)
PR: COM 100, six hours of English, and fulfillment of typewriting requirement. Introduction to the fundamental writing and fact-gathering skills of journalism, advertising, and public relations for print and electronic media.

JRN 221 The Editing of Copy (3)
PR: JRN 220. Fundamentals of copy editing for printed media, including selection, processing, and display of news and other information; studies in reader interest, readability, clarity, verification, and style.

JRN 320 News Writing (3)
PR: JRN 220. Advanced development of skills in gathering and writing news for the mass media.

*May not be offered before 1970.

JRN 322 Information Processing (3)
Planning content and format of newspapers and other periodicals; layout, dummying, departmental editing, copy desk management, and experience on publications.

***JRN 323 Public Affairs Reporting (3)**
PR: JRN 322. Study of community news sources; reporting courts, city and county government; emphasis on fact finding and skill in writing; depth reporting of significant events.

JRN 325 Public Relations (3)
PR: JRN 220 and consent of instructor. Principles and methods of building goodwill and obtaining publicity; processes of influencing public opinion, analysis of media; public relations programs, with emphasis on implementation.

***JRN 421 Editorial and Column Writing (3)**
Building the editorial page, backgrounding and interpreting the news, promoting dialogue with and among readers, guiding public opinion.

JRN 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

LIBRARY SCIENCE

LIB 301 Library Materials (3)
A general introduction to the selection, acquisition, processing, and use of all types of library materials.

LIB 321 Library Organization (3)
Basic principles and methods of library organization including processing of the collection, circulation of materials, planning and equipping libraries. Elementary treatment of binding, serials, and statistical records.

LIB 322 Library Administration (3)
Principles and practices of library administration as applied to all types of libraries; financial support, personnel, standards, planning and evaluating services.

LIB 334 Selection and Acquisition of Library Materials (3)
Principles and methods of evaluating, selecting and acquiring book and non-book materials. The use and study of standard selection aids, reviewing media, publishers and jobbers. Procedures for budgeting, financial and statistical records, gifts and exchanges.

*May not be offered before 1970.

LIB 384 History of Books and Libraries (3)
A history of books and libraries from ancient times to the present, in relation to the society of which they were a part.

LIB 424 School Library Administration (3)
PR: LIB 322. Principles and practices of library administration applied to elementary school libraries.

LIB 431 Cataloging and Classification I (3)
PR: LIB 321. Introduction to the theory and practice of cataloging and classifying library materials. Practical problems in descriptive cataloging, subject cataloging and Dewey Decimal classification as practiced in small libraries.

LIB 432 Cataloging and Classification II (3)
Additional study in the theory and practices of cataloging and classification. Introduction to Library of Congress classification and subject headings, divided and classified catalogs, and filing rules.

LIB 444 Reference Materials and Services (3)
Selection, evaluation, and use of basic reference materials, with emphasis on functions and services of a reference department.

LIB 451 Introduction to Educational Media (3)
Principles and practices of communication theory and its application in the classroom; selection, evaluation, acquisition, storage, and use of non-book materials and related equipment; organizing audio-visual services.

LIB 452 Preparation and Production of Instructional Media (3)
Selection, evaluation, and production of instructional materials with emphasis on production of projected materials; display and presentation techniques.

MANAGEMENT

MGMT 301 Management (5)
PR: ECON 203. Fundamentals of management underlying the solution of problems relating to the organization and operation of business enterprises.

MGMT 324 Production Management (5)
PR: MGMT 301. Principles and methods of production viewed from a managerial decision-making level.

MGMT 344 Organization Theory (5)
PR: MGMT 301. Elements in organizations and the processes by which

they develop and influence behavior are considered.

MGMT 347 Human Relations in Management (5)
PR: MGMT 344. The individual, interpersonal and group relations and inter-group and organizational problems in business.

MGMT 364 Personnel Management (5)
PR: MGMT 301. An investigation of personnel practices and interpersonal relationships involved in managing employees. Internal problems of labor control and the utilization of human resources are considered.

MGMT 367 Industrial Relations (3)
PR: MGMT 301. The impact of trade unionism on industrial relations; current problems, conflicts and trends; the development of managerial approaches to achieve labor-management cooperation.

MGMT 424 Production Management Problems (3)
PR: MGMT 324. Problems in the management of industrial enterprise. Management principles and mathematical analysis applied to manufacturing; product development and production; materials and production control; employee relations.

MGMT 464 Personnel Problems (3)
PR: MGMT 364. Case studies in personnel problems directed toward the application of personnel management theory and concepts to organization problems.

MGMT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MARKETING

MKTG 301 Marketing (5)
PR: ECON 203. Study of functions, institutions and basic problems in marketing of goods and services in our economy.

MKTG 324 Marketing Environment (5)
PR: MKTG 301. A course emphasizing the relationship of firm to firm, to government, to labor and to other organized groups or institutions as they interact with the marketing function of the firm.

MKTG 326 Consumer Market Behavior (5)
PR: MKTG 301 and PSY 308. An analysis of consumer motivation, buying behavior, market adjustment and product innovation. This course is concerned with the behavioral aspects of the marketing process from the

producer to the ultimate user or consumer.

MKTG 334 Pricing Policies (3)
PR: MKTG 301. The nature of marketing decisions and pricing; marketing organization and the pricing process; price theories and pricing models.

MKTG 344 Marketing Logistics (3)
PR: MKTG 301 and ECON 321 or BADM 311. The ecology, analysis and development of integrated distribution systems; the application of quantitative tools, economic analysis, transportation and marketing management in the analysis and interpretation of the design and physical flow of goods through marketing network alternatives.

MKTG 364 Advertising Management (3)
PR: MKTG 301. Analysis of field of advertising; purposes, techniques, media, organization, and role of research; economic and social aspects of advertising.

MKTG 367 Sales Management (3)
PR: MKTG 301. Problems confronting sales manager; training in sales techniques; sales objectives and policies; organization; and administration of sales force.

MKTG 384 Marketing Research (5)
PR: MKTG 301 and ECON 321. Study of research procedures and techniques applicable to problem solving in marketing. The marketing management process is analyzed; the underlying concepts related to the information needed to serve the processes are explored; and the incorporation of information resources into the management function is demonstrated.

MKTG 469 Advertising and Sales Management (3)
PR: MKTG 364, MKTG 367, and PSY 308. Managerial approach to advertising and sales management. Designed to acquaint the student with the methods of demand analysis and its application to the interrelationship to marketing management, advertising management, and sales management.

MKTG 495 Marketing Policies and Strategies (3)
PR: MKTG 384 and MKTG 469. Marketing problems and policies are explored with emphasis placed on the decision-making process.

***MKTG 499 Undergraduate Research (2-5)**
PR: Consent of instructor. May be repeated for credit.

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MATHEMATICS

MATH 100 Principles of Mathematics (4)
A study of some topics in mathematics with primary emphasis on developing conceptual understanding and broadening insights into mathematics. Not intended for students in the Colleges of Business Administration, Engineering and Technology, or Natural Sciences.

MATH 103 Elementary Functions (5)
Properties of polynomial functions, trigonometric and inverse trigonometric functions, logarithmic and exponential functions. Reviews algebra, inequalities, and related topics.

MATH 105 Finite Mathematics (5)
An introduction to the algebra of sets, the logic of statements, probability, and systems of linear inequalities.

MATH 121, 122, 123 Calculus With Analytical Geometry (5, 5, 5)
PR: Math 103 or equivalent. Analytic geometry, vectors, limits, continuity, differentiation, integration, applications, infinite series, and introductory ordinary differential equations.

MATH 211 Linear Algebra (4)
PR: MATH 122. Finite dimensional vector spaces and linear transformations; systems of linear equations, matrices, eigenvector analysis, quadratic forms; application to geometry.

MATH 221 Calculus of Functions of Several Variables (4)
PR: Math 123. Partial differentiation; optimization problems; multiple integration; line and surface integration; theorems of Green, Gauss, and Stokes; vector operators.

MATH 311, 312, 313 Algebraic Structures (3, 3, 3)
PR: MATH 211. An introduction to algebraic structures: fields, polynomial rings, rings, groups, Boolean algebra, lattices, vector spaces.

MATH 315 Introduction to Number Theory (3)
PR: Nine hours of mathematics. Divisibility; primes and composites; divisors; multiples; Euclid's algorithm; Diophantine equations; modulo arithmetic; simple continued fractions. Intended for prospective teachers of mathematics.

MATH 331 Differential Equations (4)
PR: MATH 123. Techniques of solutions of ordinary differential equations and systems of differential equations; integral transforms; boundary value problems; separation of variables; numerical techniques.

MATH 351, 352 Foundations of Geometry (3, 3)
PR: MATH 311. Euclidean geometry, geometry of transformations, projective and other non-Euclidean geometries.

MATH 421, 422, 423 Real Variable Theory (3, 3, 3)
PR: MATH 122 and MATH 312, or consent of instructor. An introduction to the structure of the real numbers, transfinite arithmetic, continuity, Riemann-Stieltjes integration, differentiation, sequences, series, sequences of functions, topology of the real numbers.

***MATH 425 Complex Variable Theory (4)**
PR: MATH 221. An introduction to the theory of complex variables: analytic functions; complex integration; Taylor and Laurent series; residue theorem; conformal mapping and harmonic functions.

MATH 491 Contemporary Mathematics (3)
PR: Consent of instructor. Concepts, problems, and advanced topics included in courses such as SMSG mathematics and other modern approaches to secondary school mathematics. For prospective teachers of mathematics. (Same as EDSE 493).

MATH 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

MATH 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

MATH 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit..

MATH 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MECHANICAL ENGINEERING & AEROSPACE SCIENCES

MEAS 341 Mechanisms (2)
PR: ENGR 311. Relative motions of machine parts; cams, rolling contact, gearing, and flexible connectors. Synthesis of mechanisms. One lecture, three hours laboratory.

MEAS 342 Dynamics in Design (2)
PR: MEAS 341. Experimental mechanics; dynamic measurements; applications of dynamics in design.

MEAS 351 Measurement Systems Engineering (3)
PR: ENGR 312 and 322. Application of system design concepts to

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measurements. Fundamental theory of static and dynamic measurements. Behavior of transducers individually and in open-loop systems. Validation of experimental data. Measurements are considered as information transfer accompanied by energy transfer. Two lectures, one laboratory lecture, two hours laboratory bi-weekly.

MEAS 371 Fluid Mechanics (3)
PR: ENGR 332. Continuation of ENGR 332. Topics in gas dynamics including shock waves, viscous flow analysis and solutions in boundary layer theory.

MEAS 372 Thermodynamics of Mechanical Systems (3)
PR: ENGR 331. Applied thermodynamics; gas mixtures, power cycles, and reactive systems.

MEAS 411 Aerodynamics (3)
PR: ENGR 332. Principles of subsonic and supersonic flight; airfoils in compressible and incompressible flow; flow about a body; thin airfoil and finite airfoil theory.

***MEAS 413 Stability and Control (3)**
PR: MEAS 411. Application of elementary aerodynamic principles to static and dynamic stability and control surface theory.

MEAS 421 Space Mechanics (3)
PR: ENGR 271 and 311. Dynamics with applications to aeronautical and astronautical problems, orbits and trajectories, motion in a resisting medium, performance and optimization of multi-stage rockets.

***MEAS 423 Vibration Analysis (3)**
PR: ENGR 271 and 312. Undamped and damped vibrations of single-degree-of-freedom systems. Forced vibrations, transient response. Many degrees of freedom systems, normal modes, vibration of elastic bodies.

***MEAS 424 Flight Vehicle Structures (3)**
PR: CEES 341. Space structures; thin-walled structures; load factors; non-symmetrical bending and transverse shear; shear center and shear flow; semi-monocoque construction, fuselage rings; multicelled structures; sandwich panels, fatigue.

MEAS 432 Propulsion Systems (3)
PR: MEAS 372. Analysis of jet propulsion systems including turbojets, ramjets, and rockets.

***MEAS 436 Mechanical Power Systems (3)**
PR: MEAS 372. Analysis and design of large power generating systems and

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components thereof with emphasis on steam plants utilizing both chemical and nuclear fuels. Boiler, turbine, condenser, and auxiliary equipment design and performance analysis.

MEAS 437 Energy Conversion (3)
PR: MEAS 372 and PHYS 344. Unconventional methods of energy conversion; particular emphasis on fuel cells, thermo-electrics, thermionics, solar energy, photovolcaics, nuclear, and magnetohydrodynamics.

MEAS 441 Principles of Design (3)
PR: MEAS 342. Design procedures; force and motion analysis; failure modes; stress and deflection analysis; stress concentration; fatigue; selected components.

***MEAS 451 Measurement Systems (3)**
PR: MEAS 351. Extension of fundamental measurement principles; discussion of DC, sine wave and pulse carrier systems and of unbalance and reference-balance measuring methods; simple computing-type transducer. Two lectures, two hours lecture-laboratory.

***MEAS 471 Statistical Thermodynamics (3)**
PR: ENGR 331. Statistical approach to thermodynamic concepts, laws, and methods of analysis. Generalized p–v–T data. Special systems.

MEAS 472, 473 Heat Transfer (3)
CR: MEAS 371. Steady and unsteady heat conduction in one and two dimensions. Application of boundary layer analysis and thermodynamics to forced and free convection of heat. Introduction to radiation concepts.

MEAS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

MEAS 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MICROBIOLOGY

MICR 100 General Microbiology (3)
PR: BIOL 100. Fundamentals of microbiology, morphology, metabolism,

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classification, cultivation, and distribution of bacteria, viruses, yeasts, etc.

MICR 101 General Microbiology Laboratory (1)
Laboratory procedures and principles in microbiology; taken concurrently with MICR 100.

MICR 210 Culture Media and Reagents (2)
PR: MICR 100. Preparation of differential, selective, and enrichment media; reagents used in microbiology.

MICR 220 Sanitary Science and Public Health (3)
PR: BIOL 100. Theories of diseases; sanitary procedures in water purification; sewage disposal, refuse collection; milk supplies; swimming pools; air contamination; and public health.

MICR 310 Pathogenic Microbiology (4)
PR: MICR 100. Microorganisms producing disease in man and other animals; means of transmission; protection against disease.

MICR 320 Advanced General Microbiology (4)
PR: MICR 100. Advanced fundamental theory and technique.

MICR 330 Microbiology of Water and Sewage (4)
PR: MICR 100. Organisms in water and their relationship to production and distribution of potable water; disposal of sewage.

MICR 340 Soil Microbiology (4)
PR: MICR 100. Soil microorganisms and their role in ammonification, nitrification, and biological processes.

***MICR 400 Determinative Microbiology (4)**
PR: 11 hours in microbiology. Microbial classification, rules of nomenclature, bacterial code and identification of species.

MICR 410 Microbial Physiology (3)
PR: MICR 320. Relationship between structure and function in microorganisms.

MICR 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

MICR 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

MICR 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

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MICR 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

MUSIC

Courses are classified as follows:

Music Theory, History, and Literature: 101, 102, 103, 104, 105, 106, 201, 202, 203, 299, 301, 302, 303, 340, 341, 342, 401, 402, 403, 450, 451, 452.

Applied Music (Ensemble and Individual Instruments): 107, 108, 109, 111, 112, 113, 114, 115, 116, 207, 208, 209, 211, 212, 213, 214, 215, 216, 307, 308, 309, 311, 312, 313, 314, 315, 316, 407, 408, 409, 411, 412, 413, 414, 415, 416, 421, 422, 423, 424, 425, 426.

FEES: Each course involving private lessons has a music fee of $25 per quarter. These courses are all those whose last two digits are 11 through 26 except for Piano 111 which has no music fee.

MUS 101, 102, 103 Music Theory (3, 3, 3)
The fundamental course in basic musicianship, integrating the various musical skills with the development of the student's musical perception and understanding. Required of all music majors.

MUS 104, 105, 106, Music Literature (1, 1, 1)
Analysis and discussion of important musical works, Baroque to contemporary periods; introduction to stylistic differences of the various musical eras.

MUS 107, 108, 109 Ensemble (1, 1, 1)
Participation in a chamber or large ensemble for purposes of studying and performing literature in the area of choral, instrumental, and keyboard media.

MUS 111 Piano (2)

MUS 112 Voice (1)

MUS 113 String (1)

MUS 114 Woodwind (1)

MUS 115 Brass (1)

MUS 116 Percussion (1)

MUS 201, 202, 203 Music Theory (3, 3, 3)
PR: MUS 103 or equivalent. Continuation of the course content and organization of MUS 101 through 103 integrated with intensive training in aural comprehension.

MUS 207, 208, 209 Ensemble (1, 1, 1)

MUS 211 Piano (2)

MUS 212 Voice (2)

MUS 213 String (2)

MUS 214 Woodwind (2)

MUS 215 Brass (2)

MUS 216 Percussion (2)

MUS 299 Introduction to Music (3)
(For non-majors.) The study of music through readings, listening, and discussions, leading to greater enjoyment of music.

***MUS 301, 302, 303 Counterpoint (3, 3, 3)**
PR: MUS 203. Analysis and creative writing in the contrapuntal-harmonic technique of Baroque composers through the various techniques of the twentieth century.

***MUS 307, 308, 309 Ensemble (1, 1, 1)**

MUS 311 Piano (2)

MUS 312 Voice (2)

MUS 313 String (2)

MUS 314 Woodwind (2)

MUS 315 Brass (2)

MUS 316 Percussion (2)

MUS 340, 341, 342 Music History (3, 3, 3)
Music in Western Civilization traced from its primitive sources to the

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present; emphasis on composers' styles in relation to the cultural backgrounds of the various eras.

***MUS 401, 402, 403 Form and Analysis (3, 3, 3)**
PR: MUS 303. Formal aspects of the styles of major composers with an emphasis on orchestral literature.

***MUS 407, 408, 409 Ensemble (1, 1, 1)**

MUS 411 Piano (2)

MUS 412 Voice (2)

MUS 413 String (2)

MUS 414 Woodwind (2)

MUS 415 Brass (2)

MUS 416 Percussion (2)

MUS 421 Piano (2-5)
May be repeated for credit.

MUS 422 Voice (2)

MUS 423 String (2)

MUS 424 Woodwind (2)

MUS 425 Brass (2)

MUS 426 Percussion (2)

***MUS 450, 451, 452 Music of the Twentieth Century (2, 2, 2)**
Problems of contemporary style; literary and technical points of view; analysis of selected works from Satie, Debussy, Ravel, Stravinsky, Schoenberg, Berg, Cage, Webern and American composers.

PHILOSOPHY

PHI 201, 202 History of Philosophy (3, 3)
Historical overview of philosophy from its Greek beginnings to modern times, emphasizing major philosophers and movements. (First quarter,

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beginnings to the Renaissance; second quarter, Bacon to Sartre.)

PHI 205 Logic (3)
Classical and modern formal logic, dealing with logical truth and inference.

PHI 301 Problems in Philosophy (5)
The major philosophical problems, such as ethics, metaphysics, epistemology, philosophy of history, philosophy of religion, philosophy of science, examined through the works of classical and modern philosophers.

PHI 311 Aesthetics (3)
Theories of art as form, representation, expression; art and value; concepts of beauty as found in the writings of great philosophers.

PHYSICAL EDUCATION – DEVELOPMENTAL

EDPE 205 Instructional Analysis in Aquatics (2)
PR: EDTA 205 and 206. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 206 Instructional Analysis in Gymnastics and Tumbling (2)
PR: EDTA 205 and 206. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 207 Instructional Analysis in Individual and Dual Sports (2)
PR: EDTA 205 and 206. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 208 Instructional Analysis in Wrestling (M) (2)
PR: EDTA 205 and 206. Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 209 Choreography of Contemporary Dance (W) (2)
PR: EDTA 205 and 206. Dance production as an art form.

EDPE 215 Rhythmic, Notation, Meter and Form (2)
PR: EDTA 205 and 206. Elements common to music and movement.

EDPE 216 Anatomy and Physiology (4)
PR: ZOOL 100. Structure and function of the human body. (Same as ZOOL 234).

EDPE 305 Rehabilitation Training Techniques (3)
PR: Admission to Phase II or consent of instructor. Recognition and

rehabilitation of sports injuries including first aid.

EDPE 306 Administration and Coaching (3)
PR: Admission to Phase II or consent of instructor. Development of optimal individual and team performance in interscholastic athletics.

EDPE 307 School and Community Recreation (3)
PR: Admission to Phase II or consent of instructor. Knowledge and skills of after school activity and summer recreational programs.

EDPE 308 Human Performance Learning (5)
PR: Admission to Phase II or consent of instructor. Theories of movement and factors influencing the learning of gross and fine motor skills. (Includes lecture and laboratory).

EDPE 309 Kinesiology (5)
PR: Admission to Phase II or consent of instructor. The application of the structure of man to the study of human movement. (Includes lecture and laboratory).

EDPE 321 Exercise Physiology – Cardiovascular (5)
PR: EDPE 216. A circulatory study of man's homeostatic regulation during environmental stress. (Includes lecture and laboratory).

EDPE 322 Exercise Physiology – Respiratory (5)
PR: EDPE 216. A study of metabolic costs and respiratory adjustment to exercise. (Includes lecture and laboratory).

***EDPE 405 Organization and Administration of Secondary School Physical Education (3)**
PR: Admission to Phase II or consent of instructor. Nature and scope of secondary school physical education, athletic, intramural and adaptive programs.

***EDPE 406 Organization and Administration of Elementary School Physical Education (3)**
PR: Admission to Phase II or consent of instructor. Nature and scope of elementary school physical education, intramural and corrective programs.

PHYSICAL EDUCATION–ENVIRONMENTAL STUDIES

The Environmental Studies Physical Education Program is designed to enhance the physical and mental development of the student.

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Each student must satisfactorily complete one course from each of the following areas: I – Individual activities; II – Team activities; and, III – Dual activities. This requirement should be completed as follows: Area I – Freshman year; Area II – Sophomore year; and, Area III – Junior year.

Area I

ESPE 101 Aquatics (1)
Instruction in basic aquatics skills – water confidence, elementary and advanced strokes and introduction to springboard diving .

ESPE 102 Life Saving (1)
PR: ESPE 101 or equivalent. Instruction in fundamental water survival and life saving skills.

ESPE 105 Golf (1)
Instruction in the basic and advanced skills, rules and etiquette.

ESPE 106 Tennis (1)
Instruction in the basic and advanced skills, rules and etiquette.

ESPE 107 Gymnastics (1)
Development of fundamental tumbling skills and performance on standard apparatus.

Area II

ESPE 205 Body Development and Team Activities (M) (1)
Participation in a formal cardiovascular, flexibility and neuromuscular development program. Performance in selected team activities – paddle ball, soccer, volley ball, etc.

ESPE 206 Body Development and Team Activities (W) (1)
Participation in a formal cardiovascular, flexibility and neuromuscular development program. Performance in selected team activities – basketball, speedball, etc.

Area III

ESPE 305 Badminton (1)
Instruction in the basic and advanced skills, rules and etiquette.

ESPE 306 Contemporary Dance (1)
Participation in creative and interpretive movement experiences.

ESPE 307 Wrestling (M) (1)
Instruction in strategic wrestling maneuvers.

ESPE 308 Track and Field (1)
Skill development in running and field events.

ESPE 309 Handball (1)
Instruction in the basic and advanced skills, rules and etiquette.

PHYSICS

PHYS 107, 108, 109 College Physics (4, 3, 3)
PR: Two years of high school mathematics. A study of classical mechanics, thermodynamics, electricity, magnetism, optics, and modern physics. Appropriate for students who desire to use physics only to satisfy the requirements of the Environmental Studies Program.

PHYS 111, 112, 113 General Physics (4, 3, 3)
PR: Two years of high school mathematics. 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 182, 183 Physics Laboratory (1, 1)
PR: PHYS 107 or PHYS 111. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 221, 222, 223 Mechanics (3, 3, 3)
PR: PHYS 113 and MATH 122. A study of mechanics including vectors, coordinate transformations, fundamental theorems of Newtonian mechanics, rigid body dynamics, small oscillations, Lagrangian mechanics, and special relativity.

***PHYS 227, 228 Classical Mechanics (3, 3)**
PR: PHYS 113 or PHYS 109. A study of statics and dynamics of rigid bodies, planetary motion, and special relativity. Intended for prospective teachers of science in secondary schools and others desiring knowledge of mechanics.

PHYS 287 Measurements in Electricity and Magnetism (3)
PR: PHYS 113 or PHYS 109. A course in circuit theory, electrostatics, and magnetism including laboratory experience in the use of equipment designed for making electrical measurements. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in basic electricity and magnetism. A combined lecture and laboratory course.

PHYS 288 Measurements in Electronics (3)
PR: PHYS 287 or PHYS 183. A lecture and laboratory study of vacuum

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tubes, semiconductors, and other electron devices as they are used in rectifiers, oscillators, and amplifiers. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in electronics.

PHYS 289 Selected Topics in Electricity and Electronics (3)
PR: PHYS 288 or PHYS 183. A study of selected areas of electricity, magnetism, and electronics including the measurement of e/m, Hall effect, radio frequency circuits, multivibrators, and logic circuits. Intended for prospective teachers of science in secondary schools and others desiring advanced work in electricity and electronics.

PHYS 331, 332, 333 Electricity and Magnetism (3, 3, 3)
PR: PHYS 113 and MATH 123. An introduction to scalar and vector fields, electrostatics, electrodynamics, magnetism, Maxwell's equations, radiation, waveguides, and physical optics.

***PHYS 335, 336 Electronics (3, 3)**
PR: PHYS 113. The study of basic D.C. and A.C. circuit theory, the properties of vacuum tubes and semiconductor diodes, power supplies, vacuum triodes and transistors, amplification, oscillation, modulation, detection, and noise.

PHYS 341, 342, 343 Modern Physics (3, 3, 3)
PR: PHYS 113 and MATH 123. The study of black body radiation, the interaction of radiation and matter, atomic spectra, nuclear and high energy physics, particle accelerators, and molecular and solid state physics.

***PHYS 344 Modern Physics for Engineers (3)**
PR: ENGR 221 and MATH 331. Selected topics in atomic, nuclear, molecular, and solid state physics. A study of spectroscopy, x-rays, nuclear radiation, and cosmic rays.

PHYS 347, 348 Concepts in Modern Physics (3, 3)
PR: PHYS 113 or PHYS 109. A study of modern physics including atomic and molecular structure, Bohr model of the atom, special relativity, and solid state physics. Intended for prospective teachers of science in secondary schools and others desiring an introductory course in modern physics.

PHYS 351, 352 Optics (3, 3)
PR: PHYS 113. A study of refraction, interference, diffraction, optical instruments, dipole radiation, Kirchhoff integral, scattering, polarization, and stimulated emission.

PHYS 354 Optics and Wave Motion for Engineers (3)
PR: ENGR 211 and MATH 221. Selected topics in optics, acoustics, and

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related wave phenomena. A study of reflection, refraction, interference, and diffraction.

***PHYS 357, 358 Wave Motion and Optics (3, 3)**
PR: PHYS 113 or PHYS 109. A lecture and laboratory study of ripple tank water waves, sound waves, microwaves, and optics. Topics in both geometrical and physical optics will be considered. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in wave phenomena.

PHYS 381 Physics Laboratory – Electronics (3)
PR: PHYS 113. Lecture and laboratory work stressing electronic principles through the study of test equipment, power supplies, amplifiers, oscillators, and pulse circuits.

PHYS 382 Physics Laboratory – Electricity and Magnetism (3)
PR: PHYS 113. Lecture and laboratory work in basic electrical measurements, measurement of e/m, transmission lines, microwaves, and Zeeman effect.

PHYS 383 Physics Laboratory – Nuclear Physics (3)
PR: PHYS 113. Lecture and laboratory work in nuclear physics stressing nuclear radiation and the interaction of radiation with matter.

PHYS 384 Physics Laboratory – Optics and Wave Motion (3)
PR: PHYS 113. Lecture and laboratory work in basic optics and wave phenomena. Selected experiments in interference and diffraction of waves, polarized light, spectroscopy, microwaves, and optical pumping.

***PHYS 385 Physics Laboratory – Modern and Solid State Physics (3)**
PR: PHYS 113. Lecture and laboratory work in selected areas of modern and solid state physics. A study of electrical conductivity in solids, temperature dependence in semiconductors, Hall effect, and electron mobility.

PHYS 461 Solid State Physics (3)
PR: PHYS 343. Properties of solids, crystal binding, free electron model, band theory of solids, Fermi surface, and solid state applications.

PHYS 471, 472 Quantum Mechanics (3, 3)
PR: PHYS 343. A study of the postulates of quantum mechanics, the Schrödinger equation, and an introduction to the statistics of many particle systems.

***PHYS 475 Statistical Physics (3)**
PR: PHYS 343. An introduction to thermodynamics, statistical mechanics, and kinetic theory.

*May not be offered before 1970.

PHYS 491 Contemporary Physics (3)
PR: Consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. For prospective teachers of physics. (Same as EDSE 494).

PHYS 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYS 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PHYS 498 Undergraduate Seminar (2-5)
Consent of instructor. May be repeated for credit.

PHYS 499, Undergraduate Research (2-5)
Consent of instructor. May be repeated for credit.

POLITICAL SCIENCE

PCL 201 American National Government (3)
A study of the dynamics of American national government including its structure, organization, powers, and procedures.

PCL 203 Principles of Political Science (3)
An introduction to the scope of political science and of its development as a field with emphasis on its areas of concern; analysis of the major approaches to the study of politics; familiarization with recent developments in research and research techniques.

PCL 301 American State and Local Government (3)
PR: PCL 201, 203 or consent of the instructor. Analysis of the organization and functions of state government and the problems of policy formulation within the context of American federalism.

PCL 305 Political Parties and Processes (3)
PR: PCL 201, 203 or consent of the instructor. Study of American politics with major emphasis upon the role, organization, and functions of parties in the American political system.

***PCL 308 The American Presidency (3)**
PR: PCL 201, 203 or consent of the instructor. A study of the transformation of the executive into a central decision-making institution and its role in the American political system.

*May not be offered before 1970.

PCL 310 Congress and the Legislative Process (3)
PR: PCL 201, 203 or consent of the instructor. The nature, role, and functions of the legislative process; the dynamics of the executive-legislative relations and resultant problems.

PCL 321 International Relations (3)
PR: PCL 201, 203 or consent of the instructor. Analysis of the fundamental principles and factors affecting interstate relations; the foreign policy decision-making processes of states; the role and problem of power; conflict and methods of resolution.

PCL 323 International Relations (3)
PR: PCL 201, 203 or consent of the instructor. Application of the theory and fundamentals of international politics to contemporary world affairs with attention to the impact of twentieth century developments upon the international system and its actors.

PCL 341 Comparative Government (3)
PR: PCL 201, 203 or consent of the instructor. An analytical and comparative study of the major governments of Europe and their impact upon the development of types of political systems.

PCL 343 Comparative Government (3)
PR: PCL 201, 203 or consent of the instructor. An analysis of non-Western political systems with emphasis upon the problems of political, socio-economic, and cultural development as they affect attempts to achieve the transformation to modernization.

PCL 360 American Political Theory (3)
PR: PCL 201, 203 or consent of the instructor. A survey of the chief contributions of American political thought, their sources and background as focused within the context of American historical and institutional development.

PCL 403 Political Behavior (3)
PR: PCL 201, 203 or consent of the instructor. A study of the role and impact of group behavior and interest articulation in a pluralistic society and their effect upon the political process.

***PCL 410 Public Administration (3)**
PR: PCL 201, 203 or consent of the instructor. Analysis of the organization, function and principles of public administration and its relationship with the various branches and levels of government.

***PCL 413 Metropolitan Government (3)**
PR: PCL 201, 203 or consent of the instructor. A study of the political

*May not be offered before 1970.

and sociological problems of urban governments and the organizational problems of overlapping units of government.

PCL 427 American Foreign Policy (3)
PR: PCL 201, 203 or consent of the instructor. An analysis of the traditions and development of American foreign policy with major emphasis on the role and policies of the United States in the contemporary world.

PCL 430 International Organization (3)
PR: PCL 201, 203 or consent of the instructor. The nature and growth of international agencies of cooperation with attention focused upon the problems and development of functional, regional, and universal organizations.

***PCL 433 International Law (3)**
PR: PCL 201, 203 or consent of the instructor. An introduction to the nature, evolution, and sources of international law and its role in interstate relations.

***PCL 461 Political Theory (3)**
PR: PCL 201, 203 or consent of the instructor. Study of the development of political and social ideas in Western thought from early Greece to the rise of the nation-state system.

***PCL 463 Political Theory (3)**
PR: PCL 201, 203 or consent of the instructor. Study of Western political and social thought from the rise of the nation-state system to the modern period.

***PCL 471 American Constitutional Law (3)**
PR: PCL 201, 203 or consent of the instructor. The impact of judicial decision-making upon the growth of American political institutions and processes.

***PCL 473 American Constitutional Law (3)**
PR: PCL 201, 203 or consent of the instructor. The role of the judiciary in the focusing and refinement of individual rights and civil liberties in American society.

***PCL 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

***PCL 499 Undergraduate Research (2-5)**
PR: Consent of instructor. May be repeated for credit.

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PROFESSIONAL LABORATORY–Application

EDPL 407 Student Teaching (3-12)
PR: Admission to Phase III. Student teaching in a public elementary or secondary school under the supervision of a selected classroom teacher.

EDPL 408 Teaching Strategies (3)
PR: Admission to Phase III. Seminar taken concurrently with student teaching. Problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

EDPL 409 Teaching Strategies (4)
PR: Bachelor's degree or consent of instructor. A seminar taken concurrently with Teaching Practicum, EDPL 465. Advanced problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

EDPL 458 Supervision of Professional Laboratory Experiences (3)
PR: Consent of instructor. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the Teacher Education Associate or Supervising Teacher.

EDPL 459 Supervision of Professional Laboratory Experiences (1) Laboratory
PR: Consent of instructor. Participation as a Teacher Education Associate or Supervising Teacher in the Florida Technological University laboratory experience program. May be taken concurrently with EDPL 458.

EDPL 465, 466 Teaching Practicum (5, 5)
PR: Bachelor's degree and approved application. Directed observation, participation, and teaching in an elementary or secondary school under the direction of a selected teacher.

PSYCHOLOGY

PSY 201, 202 General Psychology (3, 3)
The basic principles, theories, and methods of contemporary psychology.

PSY 211 Methods of Psychological Research (2)
PR: PSY 201, 202. Critical evaluation of research methods in psychology, considerations of internal and external validity.

PSY 212 Psychology of Adjustment (4)
Psychological principles of adjustment, application of psychology to problems in living.

PSY 213 Child Psychology (4)
The effects of genetic, psychological, maturational, and social factors on child behavior.

PSY 301 Basic Learning Processes (4)
PR: PSY 201, 202, STAT 401. A survey of theories and research findings from basic laboratory investigation of learning phenomena. Lec-lab.

PSY 302 Complex Human Learning (4)
PR: PSY 301. Selected topics from theories and research on complex human learning and problem solving. Lec-lab.

PSY 303 Physiological Psychology (4)
PR: PSY 201, 202. Physiological bases and correlates of behavior. Lec-lab.

PSY 304 Perception (4)
PR: PSY 201, 202. Consideration of physical and psychological variables in perceptual phenomena. Lec-lab.

PSY 305 Psychological Measurement (4)
PR: PSY 201, 202. Theory of test construction and consideration of selected measures of psychological characteristics.

PSY 307 Motivation (4)
PR: PSY 201. Psychological and physiological aspects of human motivation.

PSY 308 Social Psychology (4)
PR: PSY 201. Effects of social situations and social variables on the behavior of individuals.

PSY 309 Personality Theory (4)
PR: PSY 201. A survey of theory and research on the development of personality characteristics.

PSY 310 Abnormal Psychology (4)
PR: PSY 309. Classification, causation, and treatment of deviant patterns of behavior.

PSY 312 Clinical Psychology (4)
PR: PSY 310. Consideration of psychodiagnostics, behavioral modification techniques and clinical research.

PSY 314 Industrial Psychology (4)
PR: STAT 401. Psychological principles of employee selection, training, and morale.

PSY 401 Senior Research Proposal (2)
PR: PSY 311 and senior standing. Study in depth of bibliography and methods of psychological research. Each student will write, and have approved, a proposal for an original piece of research.

PSY 405 History and Systems of Psychology (4)
PR: 30 hours of psychology, including PSY 301, 309. Historical development of psychology with emphasis on classical theoretical positions.

PSY 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

PSY 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

PSY 499 Undergraduate Research (8)
PR: Consent of instructor.

RADIO–TELEVISION

RTV 140 Radio-Television I (3)
PR: COM 100. Nature of the media, the mechanics of operation, history, economics, programming, and internal and external controls. (Laboratory hours to be arranged).

RTV 240 Audio Production I (3)
PR: RTV 140. Sound recording; acoustics; and music and effects, both live and recorded, for radio and television. (Laboratory hours to be arranged).

RTV 241 Visual Production I (3)
PR: RTV 140. Studio operation; available means of presentation: Studio, lights, sets, decor, visual aids, cameras, audio, switching, and video and audio recording. (Laboratory hours to be arranged).

RTV 255 Performance I (3)
Communication on camera and microphone; shaping the performance in announcing, interviews, news, narrations, and commercials. (Laboratory hours to be arranged).

RTV 340 Audio Production II (3)
PR: RTV 240. The production of music (live and recorded), talk, interview, discussion, sports, and documentary including performance (talent and announcing) and direction. (Laboratory hours to be arranged.)

RTV 341 Visual Production II (3)
PR: RTV 241. Emphasis on the coordination of talent, cameras, visuals,

audio, and lighting with the dramatic values of the presentation. (Laboratory hours to be arranged).

RTV 342 Broadcast Journalism I (3)
PR: Fulfillment of typewriting requirement. (In addition, for journalism concentrates, JRN 220; for radio-television concentrates, RTV 140.) Examination of the historical, legal, and quasi-legal influences on broadcast news; introduction to news sources, writing, and interviewing techniques for radio-television news.

RTV 344 Broadcast Writing I (3)
PR: RTV 241 and consent of instructor. The development of the idea, content, and form; practice in the preparation of written materials for all kinds of radio and television programs except news, documentary, and drama.

RTV 345 Dramatic and Documentary Writing (3)
PR: For radio-television students, RTV 344 and junior standing; for others, consent of instructor.

RTV 350 Television Directing (3)
PR: RTV 340. Techniques and practice in producing and directing television programs.

RTV 351 Radio Directing (3)
Techniques and practice in producing and directing radio programs.

***RTV 441 Visual Production III (3)**
PR: RTV 241. The planning, preparation 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 Broadcast Writing II (3)**
PR: RTV 344 and consent of instructor. Preparation of documentaries and dramatic writing for radio, television.

***RTV 450 Broadcast Journalism II (3)**
PR: For journalism concentrates, JRN 220 and JRN 221; for radio-television concentrates, RTV 342. (Laboratory hours to be arranged).

***RTV 451 Radio-Television Advertising (3)**
PR: Consent of instructor. Radiobroadcasting and television as advertising media; advertisers' demands and budgets; appropriate programs for the sponsors' needs; writing of commercial continuity.

*May not be offered before 1970.

***RTV 455 Performance II (3)**
PR: RTV 255. Analysis and creation of character in commercials, documentaries, and drama; communication of dramatic values through performance.

RELIGION

REL 301 Comparative Religions of the World (5)
The religious concepts and beliefs of Hinduism, Buddhism, Judaism, Christianity, and Islam.

***REL 321 Impact of Religion on American Culture (5)**
The involvement of religious influence in American society.

***REL 401 Current Religious Problems (5)**
Religion in its relation to population, race, prejudice, efforts toward religious understanding, and other contemporary problems.

***REL 421 Religion and Ethics (5)**
Ethical values and modern religious thinking: freedom, responsibility, good and evil, changing concepts of man's worth.

RUSSIAN

RUS 101 Elementary Russian Language and Civilization (3)
Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to Russian Culture.

RUS 102 Elementary Russian Language and Civilization (3)
PR: RUS 101 or equivalent. Continuation of RUS 101.

RUS 103 Elementary Russian Language and Civilization (3)
PR: RUS 102 or equivalent. Continuation of RUS 102.

RUS 201 Intermediate Russian Language and Civilization (3)
PR: RUS 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Russian culture.

RUS 202 Intermediate Russian Language and Civilization (3)
PR: RUS 201 or equivalent. Continuation of RUS 201.

*May not be offered before 1970.

RUS 203 Intermediate Russian Language and Civilization (3)
PR: RUS 202 or equivalent. Continuation of RUS 202 with greater emphasis on Russian civilization from the Middle Ages to the present.

RUS 301 Russian Composition (4)
PR: RUS 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled written compositions required.

RUS 303 Russian Conversation (4)
PR: RUS 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

SCIENCE

SCI 490 Senior Seminar: Science in Human Affairs (2)
The impact of science on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to students majoring in the College of Natural Sciences.

SECONDARY EDUCATION–DEVELOPMENTAL

EDSE 304 Instructional Techniques (3)
PR: Admission to Phase II. Procedures, applications, and evaluation of technical skills a teacher may employ in the classroom.

EDSE 305 Secondary School Curriculum (3)
PR: Admission to Phase II. Study of total school patterns with emphasis on new trends including: individual subject areas, administration, supervision, school services and school related activities.

EDSE 306 Business Instructional Analysis–I (3)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in typewriting instruction.

EDSE 307 English Instructional Analysis (3)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and material having special application for teaching English.

EDSE 308 Mathematics Instructional Analysis (3)
PR: Admission to Phase II. Study of course objectives for the high school

curriculum and survey of methods and materials which have special application for teaching mathematics.

EDSE 309 Science Instructional Analysis (3)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching science.

***EDSE 405 Business Instruction Analysis–II (3)**
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in shorthand and related instruction.

***EDSE 406 Business Instructional Analysis–III (3)**
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in accounting and basic business instruction.

***EDSE 407 Foreign Language Instructional Analysis (3)**
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching foreign language.

***EDSE 408 Physical Education Instructional Analysis (3)**
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching physical education.

EDSE 415 Reading in the Secondary School (3)
PR: Admission to Phase II or consent of instructor. Developmental reading for the junior and senior high school pupil.

EDSE 475 Secondary School Curriculum (4)
PR: Bachelor's degree or consent of instructor. Advanced study of secondary school curriculum; patterns of organization, school services, individual subject areas, school related activities; investigation of trends, research and new curricula.

EDSE 476, 477 Directed Study in Secondary Education (5, 5)
Workshop for improvement of the secondary school curriculum. Open to in-service teachers.

EDSE 478 Instructional Analysis in Business (4)
PR: Bachelor's degree or consent of instructor. Advanced study of the instructional programs in Business; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

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EDSE 479 Instructional Analysis in English (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in English; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 485 Instructional Analysis in Foreign Language (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Foreign Language; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 486 Instructional Analysis in Mathematics (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Mathematics; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 487 Instructional Analysis in Physical Education (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Physical Education; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 488 Instructional Analysis in Science (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Science; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 489 Instructional Analysis in Social Sciences (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Social Sciences; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 491 Contemporary Biology (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as BSCS biology and other modern approaches to secondary school biology. (Same as BIOL 491.)

EDSE 492 Contemporary Chemistry (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems, and advanced topics included in courses such as CHEM Study and other modern approaches to secondary school chemistry. (Same as CHEM 491.)

EDSE 493 Contemporary Mathematics (3)
PR: Admission to Phase II or consent of instructor. Concepts, problems,

and advanced topics included in courses such as SMSG mathematics and other modern approaches to secondary school mathematics. (Same as MATH 491.)

EDSE 494 Contemporary Physics (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. (Same as PHYS 491.)

SOCIOLOGY

SOC 201, 202 General Sociology (3, 3)
An introduction to the principles of sociology. Primary emphasis is given to the understanding and application of such concepts as: human interaction, the nature of the group and group interrelationships, social and cultural systems, the individual as a reflection of his group associations.

SOC 221, 222 General Anthropology (3, 3)
An introduction to the principles of anthropology. Anthropology as a field of scientific inquiry. The nature of culture and of culturally derived norms of human behavior. The various aspects of anthropology: social anthropology, human pre-history, physical anthropology, culture and personality, anthropological linguistics.

SOC 231, 232 Social Problems (3, 3)
The study of major social problems created by the complex social situations of modern life. The careful sociological analysis of such problem areas as: crime and delinquency, poverty, racial tensions, over-population, drug addiction.

SOC 304 The Development of Sociological Thought (5)
PR: SOC 201, 202. An overview of theorists and theories concerning the nature of man as a "social being" and of the nature of society, from classical Greek-Roman period to the late 19th Century.

SOC 306 Modern Sociological Thought (5)
PR: SOC 201, 202. A study of the major European and American contributors to, and "schools" of, modern sociology. Comte, Spencer, Mill, Durkheim, Weber, Simmel, Pareto; Ward, Giddings, Thomas, Small; Sorokin, Parsons, Merton.

SOC 321 Urban Sociology (5)
PR: SOC 201, 202. Historical roots of urbanization, nature of urban

structure, the influence of the city in American life, and social institutions. Sociological problems resulting from urbanization.

SOC 322 Rural Sociology (5)
PR: SOC 201, 202. Rural American life, its resources, and the problems of changing patterns of rural social structure.

SOC 331 Social Institutions (3)
Social institutions, social differentiation, and social control, with emphasis on American and other modern societies.

SOC 333 Industrial Sociology (3)
Structure and culture of modern industry, communication and authority in management and labor, industrial morale, industry and other social organizations.

SOC 401, 402 Research Methods in Sociology (3, 3)
PR: SOC 201, 202; STAT 401. An introduction to principal techniques used in social research. The formulation of hypotheses, research design, evaluation of findings. The field survey, the case study, the use and interpretation of statistical sources, archives, secondary sources. Interviewing and schedule construction.

SOC 406 Demography (5)
PR: SOC 201, 202. The study of human populations and specialized techniques in population analysis. Numbers and distribution, composition, the vital processes and migration. Population problems. Use of demographic statistics, maps, other demographic techniques in cartography.

SOC 407 The Family (5)
PR: SOC 201, 202. The study of the family as a social institution. The family through history, and the family cross-culturally. The modern American family as a distinct social and cultural complex: the changes in the family system. Courtship and marriage.

SOC 408 Crime and Delinquency (5)
PR: SOC 201, 202; 231, 232. The sociological evaluation of a major form of social deviancy. The dynamics of criminal behavior. "Blue collar" crime and "white collar" crime. Theories of criminal behavior. Types of criminal behavior. Penology.

SOC 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

SOC 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

SOC 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

SPANISH

SPA 101 Elementary Spanish Language and Civilization (3)
Designed to initiate the student to the major language skills: listening, speaking, reading, and writing, in addition to an introduction to Spanish culture.

SPA 102 Elementary Spanish Language and Civilization (3)
PR: SPA 101 or equivalent. Continuation of SPA 101.

SPA 103 Elementary Spanish Language and Civilization (3)
PR: SPA 102 or equivalent. Continuation of SPA 102.

SPA 201 Intermediate Spanish Language and Civilization (3)
PR: SPA 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Spanish culture.

SPA 202 Intermediate Spanish Language and Civilization (3)
PR: SPA 201 or equivalent. Continuation of SPA 201.

SPA 203 Intermediate Spanish Language and Civilization (3)
PR: SPA 202 or equivalent. Continuation of SPA 202 with greater emphasis on Spanish civilization from the Middle Ages to the present.

SPA 301 Spanish Composition (4)
PR: SPA 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax and development of style. Free and controlled written composition required.

SPA 303 Spanish Conversation (4)
PR: SPA 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

SPA 311 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the Middle Ages through the Renaissance and Baroque.

SPA 312 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works of the eighteenth and nineteenth centuries.

SPA 313 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the Generation of 1898 to the present.

SPA 316 Survey of Latin-American Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the colonial period through the struggle for independence.

SPA 317 Survey of Latin-American Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the second half of the nineteenth century to the present.

SPA 401 Spanish Phonetics and Diction (2)
PR: SPA 303 or equivalent. Spanish phonology with emphasis on phonic groupings.

***SPA 421 Golden Age Drama (3)**
PR: SPA 311. A study of the drama of the Golden Age with special emphasis on Lope, Tirso, Alarcón, and Calderón. The controversies on the Spanish theatre and its influence abroad.

***SPA 423 Cervantes (3)**
PR: SPA 311. *Don Quixote.*

***SPA 441 Nineteenth-Century Spanish Literature (3)**
PR: SPA 312. Romanticism in Spanish literature.

***SPA 442 Nineteenth-Century Spanish Literature (3)**
PR: SPA 312. The realistic and naturalistic novel in Spain.

***SPA 443 The Generation of 1898 (3)**
PR: SPA 313. A study of the Generation's main authors and their works.

***SPA 451 Twentieth-Century Spanish Literature (3)**
PR: SPA 313. The contemporary Spanish novel.

***SPA 452 Twentieth-Century Spanish Literature (5)**
PR: SPA 313. Contemporary Spanish drama and poetry.

***SPA 497 Independent Study (2-5)**
PR: Consent of instructor. May be repeated for credit.

***SPA 498 Undergraduate Seminar (2-5)**
PR: Consent of instructor. May be repeated for credit.

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SPEECH

SPE 101 Fundamentals of Oral Communication (3)
Use of the body and voice; participation in various speaking situations; planning, organizing, and delivering public speeches.

SPE 160 Fundamentals of Speech (3)
PR: COM 100. A study of the principles of speech involved in the area of rhetoric and public address.

SPE 260 Discussion (3)
Nature of discussion and conference, problem analysis, duties of the participants, function of leader, and participation in various group situations.

SPE 261 English Phonetics and American Dialects (3)
Physiological description and visual notation of speech sounds; regional dialects of American English.

SPE 262 Psychology of Oral Communication (3)
Psychological principles involved in the communicative process with application to individuals and groups.

SPE 360 Persuasion: Argumentation (3)
PR: SPE 160. Study and practice in the preparation and delivery of argumentative speeches emphasizing argument, evidence, and organization.

SPE 361 Persuasion: Motivation (3)
PR: SPE 360 or consent of instructor. A study of motivational factors involved in persuasive speaking to secure belief and action.

SPE 362 Platform Speaking (3)
PR: SPE 101 or consent of instructor. Theory and method; training in selecting and organizing materials for various types of speeches; practice in thinking and speaking before an audience; contemporary speeches as examples.

SPE 370 Directing Extracurricular Speech Activites (3)
PR: Junior standing and consent of instructor. Debate, extemporaneous speech and other speech events; selection and training of contestants; interschool and intramural speech activities.

SPE 371 Speech and Human Relations (3)
Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 460 Group Dynamics (3)
PR: SPE 260 or consent of instructor. A study of human behavioral problems in various conference and group situations.

SPE 461 Studies in Modern Oral Communication Theory (3)
Comparative study of the views of modern rhetorician and oral communication theorists.

SPE 465 Research Methods (3)
Investigation of research methodology and behavioral sciences approaches to oral communication research.

***SPE 466 Quantitative Research (3)**
A study of the methods of experimental and quantitative research related to oral communication.

***SPE 470 History and Criticism of American Public Address (3)**
Rhetorical criticism of speaking and writing of American statesmen that have had an influence on political, social, and economic milieu of their times.

***SPE 471 History and Criticism of British Public Address (3)**
Rhetorical criticism of speaking and writing of British statesmen that have had an influence on political, social, and economic milieu of their times.

STATISTICS

STAT 201 Principles of Statistics (4)
Statistical concepts in modern society; an introduction to basic principles: frequency distributions, averages, variation, probability, statistical inference; presentation of data. Three hours of lecture and 3 hours of laboratory per week.

STAT 321 Business & Economic Statistics (4)
PR: ECON 203, MATH 105 and STAT 201. The use of statistical methods as scientific tools in the analysis of economic and business problems. Emphasis is placed on the collection, analysis, and interpretation of quantitative economic and business data. (Same as ECON 321).

STAT 332 Statistical Quality Control (3)
Statistical concepts and methods applied to the control of quality of manufactured products. (Same as IEMS 332).

STAT 341, 342, 343 Theory of Probability and Statistics (3, 3, 3)
PR: MATH 123. An introduction to probability; distribution functions

*May not be offered before 1970.

and their properties; role of the theory of stochastic processes; simple time dependent processes; Markov chains; sampling distributions; theory of estimation and tests of hypotheses; linear hypothesis theory, regression, and correlation; the multivariate normal distribution; non-parametric methods.

STAT 345 Probability and Statistics for Engineers (3)
PR: MATH 221. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as ENGR 371).

STAT 401, 402, 403 Statistical Methods (3, 3, 3)
The role of statistics in research; methods of analyzing data from experiments and surveys; statistical concepts and models; estimation; tests of hypotheses; regression and correlation; analysis of variance and covariance; an introduction to the principles of the statistical design of experiments and surveys.

STAT 411 Experimental Design (3)
PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; experimental unit technique; complete block designs; confounding in factorial experiments; incomplete block designs; response surface methodology.

STAT 421 Survey Design (3)
PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

STAT 433 Genetic Statistics (3)
PR: BIOL 200 and STAT 402. Statistical concepts in quantitative genetics. Derivation, definition, and estimation of genetic parameters. The application of statistical models to the design, analysis, and interpretation of quantitative genetic experiments. Genetic and statistical implications of common selection procedures.

STAT 435 Probability for Engineers (3)
PR: STAT 345. Combinatorial analysis, sample space, events, probability, discrete and continuous random variables, probability distributions with applications in engineering. (Same as EMCS 431).

***STAT 436 Statistics for Engineers (3)**
PR: STAT 345. Significance tests and confidence intervals, tests of

*May not be offered before 1970.

hypotheses, simple and multiple regression and correlation with applications in engineering. (Same as EMCS 432).

STAT 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

STAT 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

STAT 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

STAT 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

TEACHING ANALYSIS

EDTA 205 Teaching Analysis (5)
Initial requirement; an opportunity to examine and participate in general and specific dimensions of teaching with socio-economic factors emphasized. EDTA 206 recommended concurrently.

EDTA 206 Human Development (3)
Analysis of basic principles and applications in growth and learning from conception through adolescence. EDTA 205 recommended concurrently.

EDTA 305 Principles of Evaluation (3)
PR: Admission to Phase II. Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306 Learning Theory (3)
PR: Admission to Phase II. Study of applications of learning theory to classroom teaching.

EDTA 405 Teaching Analysis (4)
PR: Bachelor's degree or consent of instructor. Advanced study, examination, and participation in general and specific dimensions of the teaching task in current American society.

EDTA 406 Human Development (4)
PR: Bachelor's degree or consent of instructor. Advanced study of basic principles and their application in physical, intellectual, emotional and social development from conception through adolescence.

EDTA 407 Learning Theory (4)
PR: Bachelor's degree or consent of instructor. Analysis and advanced study of the applications of learning theory as applied to teaching in the elementary and secondary classroom.

EDTA 490 Senior Seminar: Education in Human Affairs (2)
Provides an overview of basic objectives, strategies, and techniques in education. This course primarily intended for the senior student, is offered as one of the advanced Environmental Studies Seminars. Not open to the student enrolled in the College of Education.

THEATRE

THA 180 Study of Drama and Theatre (3)
PR: COM 100. Nature of drama and the theatre, and basic principles of play analysis.

THA 280 Basic Theatre Practice (3)
Introduction to stagecraft, lighting, properties, costume design. (Laboratory hours to be arranged and practical experience on technical crews as required.)

THA 281 Acting I (3)
Study and practical experience in problems of creating characterization, with emphasis on developing vocal and physical skill in acting.

THA 290 Interpretation I (3)
Analysis of thought; development of imagination; oral presentation of literary forms; individual problems in interpretive reading. (Recommended for students majoring in English and preparing to teach literature.)

THA 380 Directing I (3)
Fundamental principles of play-directing; demonstrations of theory in group exercises. Each student is required to direct two short scenes for laboratory presentation and criticism. (Laboratory hours to be arranged, and work in departmental productions.)

THA 381 Scene Design (3)
Study and practice of scene design; perspective drawing, fundamentals of design, and techniques of scene painting. (Service on crews as required.)

THA 382 Stage Lighting (3)
PR: Junior standing. Study of stage lighting techniques, practices, and equipment. (Service on light crew is required.)

THA 383 Make-Up (3)
PR: Consent of instructor. Theory and practice of the art of make-up.

THA 390 Interpretation II (3)
PR: THA 290 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 391 History of the Theatre (3)
Development of theatre art from the earliest times through the sixteenth century.

THA 392 History of the Theatre (3)
Development of theatre art from the beginning of the seventeenth century through the nineteenth century.

***THA 393 History of Costume (3)**
Study of costumes from earlier times to the present and their use on the stage.

THA 480 Directing II (3)
PR: THA 380. Advanced theory and technique of play direction, study of dramatic values, play structure, style, mood, composition, and directing approach. Each student will direct scenes in class and laboratory and serve as assistant director or stage manager on a major production.

THA 481 Acting II (3)
PR: THA 281. Study and practical experience in creating roles in plays of different type, style, and period, with emphasis on developing flexibility of actor's equipment. (Laboratory hours to be arranged and work in departmental productions.)

***THA 484 Playwriting (3)**
The study and practice of writing plays; lectures, script readings, and discussions. The student will write a short play.

THA 489 Studies in Oral Interpretation (3)
PR: THA 290. Individual oral reading projects; an intensive study of the literature for interpretation.

***THA 491 Play Analysis (3)**
PR: Consent of instructor. The theory and philosophy of the theatre; analysis of various types of plays, both modern and historical, from the point of view of their production on a stage.

***THA 492 High-School Play Directing (3)**
Introduction to the theory and practice of directing and producing, with particular emphasis upon methods practicable in high-school and junior-college play productions.

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***THA 495 Dramatic Criticism (3)**
PR: Consent of instructor. Analysis of the nature of past and present day criticism of the drama; practical work in such criticism.

TRANSPORTATION

TRAN 301 Principles of Transportation (5)
PR: ECON 203. The economic characteristics, organization, and services of the different modes of transportation.

***TRAN 401 Transportation Pricing and Policy (3)**
PR: ACCY 103 and TRAN 301. An analysis of transportation costs, financing, rate making, and governmental regulation.

***TRAN 411 Transportation Planning (3)**
PR: TRAN 401. An analysis of the major problems of the American transportation system and an examination of policies for the development of an efficient transportation system.

***TRAN 499 Undergraduate Research (2-5)**
PR: Consent of instructor. May be repeated for credit.

ZOOLOGY

ZOOL 100 General Zoology (3)
PR: BIOL 100. Introduction to zoology; structure, function, representative groups; current concepts in zoological sciences.

ZOOL 101 General Zoology Laboratory (1)
Laboratory exercises illustrating basic principles in zoology; taken concurrently with ZOOL 100.

ZOOL 200 Invertebrate Zoology (4)
PR: ZOOL 100. Taxonomy, anatomy, and ecology of the invertebrate animals.

ZOOL 220, 221 Comparative Vertebrate Anatomy (3, 3)
PR: ZOOL 100. The vertebrate animals; relationship of organs and systems; and their phylogenetic significance.

ZOOL 230 Taxonomy of the Vertebrates (4)
PR: ZOOL 100. A survey of the common elements of the vertebrate fauna

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suitable for non-biologists and potential teachers.

ZOOL 234 Anatomy and Physiology (4)
PR: ZOOL 100. The structure and function of the human body. (Same as EDPE 216).

***ZOOL 240 General Entomology (4)**
PR: ZOOL 100. Introduction to insects; their identification, biology and ecology.

ZOOL 300 Comparative Vertebrate Embryology (4)
PR: ZOOL 100 and preferably ZOOL 220-221. Embryology of the vertebrates; fertilization of egg; stages of cleavage; development of organs and systems.

ZOOL 310 Animal Physiology (5)
PR: ZOOL 100 and junior standing. Function and interrelationships of nervous, endocrine, muscle, reticulo-endothelial, reproductive, excretory, respiratory, and digestive systems; immunology, serology.

ZOOL 320 Animal Parasitology (4)
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 330 Histological Technique (4)
PR: ZOOL 100 or consent of instructor. Preparation of tissues for microscopic study; paraffin, CO_2 and cryostat methods; use of microtome; staining procedures; whole mounts.

***ZOOL 340 Vertebrate Histology (4)**
PR: ZOOL 100. Anatomy, structure and function of major cell types and tissues.

***ZOOL 350 Animal Ecology (3)**
PR: ZOOL 100 and 11 hours in the biological sciences. Effects of environmental factors on various vertebrate and invertebrate groups.

ZOOL 360 Game Conservation and Management (3)
PR: ZOOL 100. Principles of conservation and management; habitat improvement; wildlife techniques; public relations.

***ZOOL 400 Advanced Animal Biology (2)**
PR: ZOOL 100 and junior or senior standing. Selected topics in animal biology; modern zoological theory and principles; recent research.

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ZOOL 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 497 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 498 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.

ZOOL 499 Undergraduate Research (2-5)
PR: Consent of instructor. May be repeated for credit.

*FACULTY**

MILLICAN, CHARLES N. (1965), B.S., M.A., Ph.D. (University of Florida)–President of the University and Professor of Finance

ABBOTT, DAVID W. (1968), B.A., M.S., Ph.D. (University of Massachusetts)–Associate Professor of Psychology

ADICKS, RICHARD R., JR. (1968), B.A.E., M.A., Ph.D. (Tulane University)–Assistant Professor of English

ALLEN, GEORGE E. (1968), B.S., M.S., Ph.D. (Mississippi State University)–Associate Professor of Biological Sciences

ANDERSON, MISS B. BETTY (1968), A.A., B.A., M.A. (Michigan State University)–Assistant Professor of Education

ARNOLD, ROBERT L. (1968), B.A., M.A., Ph.D. (Ohio University)–Associate Professor of Communications

ARTHUR, PAUL D. (1968), B.S., M.S., Ph.D. (California Institute of Technology)–FTU Professor of Engineering Courtesy Appointment; Professor of Aerospace Engineering and Engineering Science and Mechanics, GENESYS–Port Canaveral, University of Florida

BAKER, GRAEME L. (1968), B.S., M.S., Ph.D. (Montana State University)–Chairman, Department of Chemistry and Professor of Chemistry

BARNES, MRS. MADELYN W. (1968), B.A., M.A. (University of South Florida)–Instructor of English

BARR, MURRAY P. (1968), B.S., M.S. (Adelphi University)–Assistant Professor of Mathematical Sciences

BEADLE, JAMES S. (1968), B.S., A.M., Ph.D. (Michigan State University)–Resident Professor of the Cocoa Continuing Education Center

BLEDSOE, ROBERT L. (1968), A.B., M.A. (University of Florida)–Assistant Professor of Political Science

BOLEMAN, JAY S. (1968), B.S. (University of South Carolina)–Assistant Professor of Physics

BOLTE, JOHN R. (1968), B.A., M.A., M.S., Ph.D. (State University of Iowa)–Assistant Dean for Academic Affairs and Professor of Physics

BRACKNEY, ROSS C. (1968), A.B., M.A. (University of Notre Dame)–Assistant Professor of English

BRENNAN, JOHN J. (1968), B.S., M.S. (Worcester Polytechnic Institute)–Assistant Professor of Physics

BROWNE, ROLAND A. (1968), B.A., M.A., C.E.F. (Queen's University, Canada)–Assistant Professor of English

BUDINA, JOHN W., JR. (1968), A.B., M.B.A., Ph.D. (St. Louis University)–Associate Professor of Business Administration

CERVONE, ANTHONY V. (1968), B.A., Ph.D. (St. Louis University)–Associate Professor of Foreign Languages

COMBS, HOMER C. (1968), A.B., M.A., Ph.D. (Northwestern University)–Chairman, Department of English and Professor of English

COMISH, NEWEL W. (1968), B.S., M.S., Ph.D. (The Ohio State University)–Professor of Business Administration

D'AUGUSTINE, CHARLES H. (1968), B.S., M.A., Ph.D. (Florida State University)–Associate Professor of Education

DUTTON, ARTHUR M. (1968), B.S., Ph.D. (Iowa State University)–Professor of Mathematical Sciences

ELLIS, LESLIE L. (1968), B.S., M.S., Ph.D. (University of Oklahoma)–Chairman, Department of Biological Sciences and Professor of Biological Sciences

ESLER, WILLIAM K. (1968), B.A.Ed., M.A.Ed. (Kent State University)–Assistant Professor of Education

*As of May, 1968.

EVANS, RONALD D. (1968), B.S., M.N.S., M.S. (Arizona State University) –Assistant Professor of Engineering

FLICK, ROBERT G. (1968), B.S., M.A., Ph.D. (University of Florida)–Associate Professor of Humanities

GAMBRELL, CARROLL B., JR. (1967), B.S., M.S.E., Ph.D. (Purdue University)–Vice President for Academic Affairs and Professor of Engineering

GERBER, HOMER C. (1968), B.S., M.A. (University of Illinois)–Assistant Professor of Mathematical Sciences

GREEN, PAUL M. (1967), A.B., M.S., Ph.D., LL.D. (Miami University)–Dean, College of Business Administration and Professor of Business Administration

HALL, HARRY O. (1967), B.A., M.Ed., Ed.D. (University of Florida)–Professor of Education

HAMILTON, JOHN C. (1968), B.S.E.E., M.S.E.E. (Oklahoma State University)–Associate Professor of Engineering

HAMRICK, OLIN M., JR. (1968), A.B., M.S. (University of Georgia)–Assistant Professor of Psychology

HARDEN, RICHARD C. (1968), B.M.E., B.E.E., M.S.E., Ph.D. (University of Florida)–FTU Professor of Engineering Courtesy Appointment; Resident Director and Professor of Electrical Engineering, GENESYS–Orlando, University of Florida

HARTMAN, J. PAUL (1968), B.S., B.S.C.E., M.S. (Harvard University)–Assistant Professor of Engineering

HENDERSON, BILLY J. (1968), B.S., M.S., Ph.D. (University of Georgia)–Assistant Professor of Physics

HERTEL, GEORGE R. (1968), B.S., M.S., Ph.D. (Johns Hopkins University)–Assistant Professor of Chemistry

HERNANDEZ, DAVID E. (1968), B.S., M.S., Ed.D. (Florida State University)–Associate Professor of Education

HICKS, ROBERT E. (1968), B.S., M.A., Ph.D. (Ohio State University)–Assistant Professor of Business Administration

HUNTER, RICHARD D. (1967), B.S., M.A. (University of Notre Dame)–Associate Professor of Education

HURST, JOHN W. (1968), B.S., M.M. (University of South Carolina)–Assistant Professor of Mathematical Sciences

JACKSON, LELAND H. (1968), B.A., M.A., Ph.D. (Texas Christian University)–Assistant Professor of History

JAGGER, WILLIAM G. (1968), B.A., M.A. (Emory University)–Assistant Professor of Sociology

JUGE, FRANK E., JR. (1968), B.S., Ph.D. (University of Arkansas)–Assistant Professor of Chemistry

KERSTEN, ROBERT D. (1968), B.S., M.S., Ph.D. (Northwestern University)–Dean, College of Engineering and Technology and Professor of Engineering and Director of University Research

KISSEL, BERNARD C. (1968), A.S., B.A., M.A., Ph.D. (University of Michigan)–Chairman, Department of Communications and Professor of Communications

LEFFLER, PAUL W., JR. (1968), B.Ed., M.Ed. (Florida Atlantic University)–Instructor of Education

LOTZ, STEVEN D. (1968), B.A., M.F.A. (University of Florida)–Assistant Professor of Art

LUKAS, GAZE E. (1968), B.S., M.S., J.D. (University of Illinois)–Professor of Business Administration

MANESS, MRS. NORMA G. (1968), B.A., M.A. (University of Miami)–Assistant Professor of English

MANN, MARSHALL J., JR. (1968), B.A., M.A. (Sam Houston State College)–Assistant Professor of Biological Sciences

MARTIN, ROBERT D. (1967), B.S., A.M., M.A., Ed.D. (Duke University)–Associate Professor of Education

MAYS, DAVID D. (1968), M.A., Ph.D. (Tulane University)–Associate Professor of Communications

McGEE, WILLIAM W. (1968), B.S., M.S., Ph.D. (University of Florida)–Assistant Professor of Chemistry

McLAIN, MISS J. NANNETTE (1968), B.S., M.Ed. (University of Georgia)–Assistant Professor of Education

MICARELLI, CHARLES N. (1967), B.A., M.A., Ph.D. (Boston University)–Dean, College of Humanities and Social Sciences and Professor of Foreign Languages

MILLER, C. C. (1967), B.A., M.Ed., Ed.D. (Florida State University)–Dean, College of Education and Professor of Education

MILLER, ERNEST E. (1968), B.S., M.S., Ed.D. (University of North Dakota)–Associate Professor of Education

NEEL, RICHARD E. (1967), B.S., M.S., Ph.D. (Ohio State University)–Chairman, Department of Economics and Professor of Business Administration

O'KEEFE, M. TIMOTHY (1968), B.A., M.A. (University of North Carolina)–Assistant Professor of Communications

OMANS, STUART E. (1968), B.A., M.A. (Miami University)–Assistant Professor of English

OSTLE, BERNARD (1967), B.A., M.A., Ph.D. (Iowa State University)–Dean, College of Natural Sciences and Professor of Mathematical Sciences

POE, MRS. LILLIAN F. (1968), B.S., M.A.T. (Rollins College)–Instructor of Education

RAUTENSTRAUCH, CARL P. (1968), B.S., M.A., Ph.D. (Auburn University)–Assistant Professor of Mathematical Sciences

REXROAD, HARVEY N. (1968), B.S.E.E., M.S., Ph.D. (Duke University)–Chairman, Department of Physics and Professor of Physics

ROHTER, FRANK D. (1968), B.S., M.Ed., Ph.D. (University of Southern California)–Associate Professor of Education

ROTHBERG, ROBERT A. (1968), B.S., B.A., B.Ed., M.Ed., Ed.D. (Florida State University)–Assistant Professor of Education

SALTSMAN, ROBERT R. (1967), B.A., M.B.A. (Kent State University)–Associate Professor of Business Administration

SARAKATSANNIS, LEONIDAS N. (1968), B.M., M.M., A.Mus.D. (University of Cincinnati)–Associate Professor of Music

SIMONS, FRED O., JR (1968), B.S.E.E., M.S.E., Ph.D. (University of Florida)–FTU Assistant Professor of Engineering Courtesy Appointment; Assistant Professor of Electrical Engineering, GENESYS–Orlando, University of Florida

SMITH, WILLIAM F. (1968), B.A., M.S., Sc.D. (Massachusetts Institute of Technology)–Associate Professor of Engineering

SYLVESTER, KENNETH R. (1968), B.C.S., M.C.S., M.B.A. (Rollins College)–Assistant Professor of Business Administration

TANDY, RICHARD E. (1968), B.A., M.S. (Louisiana Polytechnic University)–Assistant Professor of Biological Sciences

TEEPLE, EUGENE E. (1968), B.S., M.B.A., D.B.A. (University of Oregon)–Associate Professor of Business Administration

THOMPSON, MISS NANCY SUE (1968), A.B., A.M. (Indiana University)–Instructor of Foreign Languages

UNKOVIC, CHARLES M. (1968), B.A., M.A., Ph.D. (University of Pittsburgh)–Chairman, Department of Sociology and Professor of Sociology

WARD, GERALD C. (1968), B.S., M.S. (Northwestern University)–Assistant Professor of Engineering

WILSON, JAMES (1968), B.A., M.S. (Illinois State University)–Assistant Professor of Business Administration

WHITE, KENNETH R. (1968), B.S., M.S. (University of Oklahoma)–Assistant Professor of Business Administration

WHITTIER, HENRY O. (1968), B.S.Ed., M.A. (Miami University)–Assistant Professor of Biological Sciences

ADJUNCT APPOINTMENTS

BACHMANN, ANN O., B.A., M.A., Ph.D. (Florida State University)–Faculty Associate, Foreign Languages

BROCK, LARRY S., B.S., C.P.A. (Florida State University)–Teaching Associate, Business Administration

BROWN, W. REX, B.S., M.Ed., Ed.D (University of Oklahoma)–Teaching Associate, Education

CHAPMAN, W. DAN, B.S., M.A. (Louisiana State University)–Teaching Associate, History

CORNELL, RICHARD A., B.S.Ed., M.S.Ed. (Syracuse University)–Teaching Associate, Library Science

ENGERT, C. BARTH, B.A., M.A. (Columbia University)–Teaching Associate, Sociology

GOREE, JOHN PHILIP, B.A., M.Ed. (University of Florida)–Teaching Associate, Sociology

HUMPHREY, ROBERT H., B.A., M.A., Ed.D (University of Missouri)–Teaching Associate, Continuing Education

KETCHERSID, ARTHUR L., B.S., M.S. (Florida State University)–Teaching Associate, Library Science

POOLE, HARRY A., B.A., M.A., Ph.D. (University of Illinois)–Teaching Associate, Computer Science

RODMAN, FRAZER W., M.E., M.B.A. (University of Pennsylvania)–Teaching Associate, Business Administration

SARCHET, MRS. B. GWEN, B.S., M.A. (University of Oklahoma)–Teaching Associate, Education

SIMMONS, J. THOMAS, JR., B.S., M.S. (Florida State University)–Teaching Associate, Business Administration

SNELLINGS, MRS. GERALDINE H., B.S., M.S. (Florida State University)–Teaching Associate, Library Science

TUCKER, DAVID A., B.A., M.A., Ph.D. (Florida State University)–Faculty Associate, Psychology

REQUEST FOR APPLICATION

The perforated form shown below, or a personal letter, may be used to request an application for admission to Florida Technological University. The application will be sent to you by return mail.

Director of Admissions
Florida Technological University
Post Office Box 25000
Orlando, Florida 32816

Dear Sir:

Please send an application for admission to:

Name: _____
(FIRST) (MIDDLE) (LAST)

Street Address (or Box Number): _____

City and State: _____ Zip Code: _____

Signed: _____

Date: _____

Outdoor Physical Education Facilities

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