Art History Concentration

The following are the 63 quarter hour minimum requirements for an art history major (each course requiring a grade of "C" or better):

1. Visual Concepts I (two-dimensional), Visual Concepts II (three-dimensional) and Basic Seminar, totaling 10 credit hours.
2. Minimum of 20 credit hours of 400-level art history courses (of this, Twentieth Century art history, 4 credit hours, is required).
3. Seminar in the History of Art History for 4 credit hours.
4. A minimum of 16 credit hours in Idea Seminar (2 quarter hours each) and/or Directed Readings (1 to 6 quarter hours each) and/or Critical Studies in Art History (4 quarter hours each).
5. Art Senior Seminar, 3 credit hours.
6. Ten additional credit hours of art courses, to total a minimum of 63 quarter hours.
7. A proficiency in at least one foreign language, with either French or German being strongly recommended. In lieu of some considerable direct living experience with another language, it is suggested that a minimum of two years of college-level study of a language be undertaken.

For more specific information as to the satisfaction of this requirement, the student should consult with the faculty of the art history area of the art department.

Special Requirements for All Art Majors

At the discretion of the art department, major students may be required to take up to 22 hours of courses outside the art department which are deemed necessary to meet the particular needs of individual students engaged in special areas of study in that department. Of these, at least 9 hours must be taken in the other departments of the College of Fine Arts.

Transfer credit will be given on the basis of portfolio and transcript evaluation.

The requirements for the bachelor's degree in Art Education are listed under the College of Education.

Visiting Artists and Artists-in-Residence:

The art department is widely known for the consistent level of excellence of its programs. Aside from the obvious attribution to the overall excellence of quality of its permanent in-residence artist teaching staff, in order to insure the continuing expansion of learning opportunities available to students, the art department regularly brings to the campus' studios established professional working artists as supporting resources for its art-teaching activities. Such artists provide a unique supplemental extra-dimension to the arts studies programs of particular value to students.

Among those artists who have articulated to students valuable first-hand information about, and who have convincingly on-the-spot demonstrated direct experience with, current developments in the arts: Scott Bartlett, Larry Bell, Friedl Dzubas, Allen Jones, Nicholas Krushenick, Daniel Lang, Paul Sarkisian.

DANCE (DAN)

The dance curriculum is designed for students interested in dance as an art form. Their objectives may be to continue their education in graduate school, to teach in a college or a private school, or to pursue a career as a performer and/or choreographer.

Major concerts are given during each quarter as well as workshop performances. Through the Florida Center for the Arts, major dance companies are brought to the campus giving students the opportunity of taking classes with the professional dancers.

Requirements for the B.A. Degree:

Modern majors are required to take, for a total of 63 hours:

- DAN 201 (3) DAN 305 (3) DAN 413 (3)
- DAN 202 (3) DAN 311 (1) DAN 453 (3)
- DAN 203 (3) (three credits) DAN 463 (3)
- DAN 301 (4) DAN 313 (3) DAN 464 (3)
- (eight credits) DAN 401 (5)
- DAN 302 (4) (15 credits)
- DAN 303 (3) DAN 403 (3)

Ballet majors are required to take, for a total of 63 hours:

- DAN 201 (3) DAN 303 (3) DAN 313 (3)
- DAN 202 (3) DAN 305 (3) DAN 402 (5)
- DAN 203 (3) DAN 311 (1) (15 credits)
- DAN 301 (4) (three credits) DAN 413 (3)
- DAN 302 (4) *DAN 312 (1) DAN 453 (3)
- (eight credits) (six credits) DAN 464 (3)

Entrance to all technique courses will be by jury examination.

Dance majors are also required to take 35 hours of free electives. Of this time, a maximum of 28 hours may be in the dance department.

Special requirements for dance majors come to 22 hours. Nine hours must be taken in the other departments of the College of Fine Arts. The remaining 13 hours will be assigned to the student based on his individual needs as determined by the department.

The University's General Distribution requirement consisting of 60 hours may be found on page 33. The above requirements total 180 hours. Junior dance majors are required to do a dance project.

Senior dance majors are required to choreograph and perform in a senior dance program.

Prospective students must contact the dance department to arrange for an audition prior to registration. Beginning courses may only be repeated three times. A student must audition each quarter to stay at his present level or to advance to a higher level.

Until students are accepted into Intermediate Modern or Intermediate Ballet they will be considered probationary dance majors.

Students should refer to page 93 for graduation requirements.

Visiting Artists and Artists-In-Residence:

By supplementing its excellent on-going regular staff-instructed dance curriculum with other professional resources made available through the Visiting Artist and Artist-in-Residency programs, the dance department provides for dance students an overall dynamic program for practice, study and learning.

An impressively lengthy list of the extraordinary individual dance and dance company participation in one or more programs includes:

Murray Louis Dance Co. Lucas Hoving Dance Co.
First Chamber Dance Co. New Caledonia Singers
Claude Kipnis Mime and Dancers
Theatre
Louis Falco Dance Co. Ballet Marjo
Nikolais Dance Theatre Luis Rivera Co.
Kerela Kalamandalam Utah Repertory Dance
Co. Team
Dance Theatre of Harlem Clifford Keuter Dance Co.
Merce Cunningham Kelly Hogan
Dance Co.
Jose Limon Co.
Alvin Alley American James Cunningham Co.
Dance Theatre
Lar Lubovitch Dance Co.
Don Redlich Dance Co.

*Six quarters of Pointe Technique (women), or six quarters of Partner of Men's classes.
MUSIC

The Departmental Major:

The music curriculum is designed for those students gifted in the performance and/or composition of music. Candidates for a major in music are required to pass an entrance examination in their respective performance and/or composition areas. All new registrants are also required to take a placement examination in music theory and literature. Students may obtain dates and times for these examinations from the music department office. Completion of those examinations is required before registration in music courses can be permitted.

Academic Programs Offered Include:

Bachelor of Arts degree with areas in:

- Performance (voice, piano and orchestral instruments)
- Composition

Requirements for the B.A. Degree:

All students seeking a degree in music are required to (1) complete successfully the secondary piano requirements as defined by the music faculty, (2) present a partial public recital during their senior year. These requirements are in addition to the actual course requirements listed below.

A total of 96 hours is required as follows:

**MUSIC THEORY (30)**
- MUS 201 (3)
- MUS 202 (3)
- MUS 203 (3)
- MUS 221 (2)
- MUS 231 (2)
- MUS LITERATURE (6)
- MUS 231 (2)
- MUS 232 (2)
- MUS HISTORY (9)
- MUS 401 (3)

For applied majors, 36 hours of applied music is required:

- MUS 204 (9)
- MUS 404 (9)
- MUS 454 (9)
- MUS 304 (9)

One ensemble per quarter is required in conjunction with applied music enrollment.

For Composition Majors:

Undergraduates majoring in composition must complete a minimum of 36 credit hours from among the following sequence of courses including MUS 307 and at least one quarter of MUS 458, satisfying all necessary prerequisites for all courses:

- MUS 205 Introduction to Electronic Music (3)
- MUS 208 Composition (3)
- MUS 308 Composition (3)
- MUS 309, 310, 311 Contemporary Techniques of Composition (3,3,3)
- MUS 408 Composition (3)

- MUS 455, 456, 457 Electronic Music—Real-Time Performance (3,3,3)
- MUS 458 Composition (3)
- MUS 459 Seminar in New Musical Systems (3)
- MUS 410, 411 Orchestration (3,3)

In consultation with, and with the approval of the entire composition faculty, the senior requirement for composition majors is to be satisfied in any of the following three ways, or in other ways so designated by the composition faculty: (1) a complete public concert of works by the student composer, (2) the public performance of several compositions in various concerts throughout the composer’s senior year, (3) the formal presentation to the composition faculty of an extensive portfolio of compositions plus the public performance of at least one of these works during the senior year.

The Faculty:

USF’s superior music faculty has been carefully chosen for its training, performing ability, and ability to teach. It is in every sense a team. This achievement has been demonstrated by such fine musical ensembles as the Faculty String Quartet, the Faculty Brass Quintet, the Ars Nova (faculty) Woodwind Quintet and the Faculty Chamber Players.

Unique Learning Opportunities:

The music department at the University of South Florida offers the student the opportunity to study with a distinguished faculty, work with the newest in creative equipment, and to be in the company of other superior music students for an extensive, exciting and exacting period of study.

SYCOM — The Systems Complex for the Studio and Performing Arts offers the student the opportunity to work with an unusually well developed electronic facility for creative research and compositional opportunity.

Visiting Artists and Artists-In-Residence:

The Department of Music utilizes guest composers, conductors, and performing musicians to enhance its offerings in terms of teaching faculty, forum appearances, and the conducting of musical programs, symposia, and clinics. Prominent musicians who have appeared in the past are Howard Hanson, Norman Delio Joio, Randall Thompson, Virgil Thomson, David Ward-Steinman, Walter Trampler, Fred Hemke, Eleazar de Carvalho, Thomas Nee, Lucas Foss, Maurice Andre, John Haynie, Jean Pierre Rampal, and Julius Baker.

Student Organizations:

Sigma Alpha Iota, national professional music fraternity for women, and Phi Mu Alpha Sinfonia, a professional music fraternity for men, are dedicated to serve the cause of music in America. Student Music Educators National Conference is an affiliate of the Music Educators National Conference and is open to all interested students.

Financial Aid:

The University has made available to highly qualified undergraduate students a number of music service awards. Usually these awards cover in-state tuition fees, and are distributed following open auditions held in January and February. The award is made for the following year for three of the four quarters. Available to graduate students who show special potential for creative contribution to the profession are the University Scholar Awards and graduate assistantships and fellowships. Additionally, loans, grants and work programs are available to qualified University of South Florida students. Financial aid is granted on need, academic promise and character.
The Departmental Major:

Through its curriculum and production program, the theatre department offers to seriously interested students the opportunity to prepare themselves for the beginning of a professional career in the Theatre or to continue their studies at the graduate level. In addition, students from other departments have the opportunity to study and participate in the work of the department, thereby allowing them to gain insight into the creative experience of Theatre.

After a thorough orientation to all facets of the art gained in the basic courses, the theatre major may begin to concentrate in either the area of performance or design and technology. Throughout the student's course of study, contact is encouraged by the faculty in the student's chosen area of concentration to help the student realize his/her full potential and to help maintain awareness of progress. To earn a major in theatre, the student must take a minimum of 64 quarter hours in the basic courses, the theatre major may begin to concentrate in either the area of performance or design and technology. Throughout the student's course of study, contact is encouraged by the faculty in the student's chosen area of concentration to help the student realize his/her full potential and to help maintain awareness of progress. To earn a major in theatre, the student must take a minimum of 64 quarter hours in theatre. In addition to these, 28 hours of electives in the theatre department may be taken to broaden either the general program or to pursue a particular interest in more depth.

Through the production program, which includes various performances for general audiences, children and department faculty and students, the student has the opportunity to participate in many different ways, thereby gaining practical experience that is essential to his/her development as an artist.

For the more advanced acting student, opportunities sometimes arise for participation with other companies in the area. The Design/Technology area of the Florida Center (see description elsewhere in this section) offers to the advanced Tech and Design student opportunities to work with the professional companies (Dance, Theatre and Music) that come to the campus as a part of the University Artist Series and Dance Residency Program. For all students, a broad involvement in all facets of their field of concentration is encouraged.

Visiting Artists and Artists in Residence:

Despite the fact that the University is relatively young the theatre department has had in residence artists from many kinds of theatre and many countries including: London's West End, The Actors Studio, Dublin's Abbey Theatre, Broadway, Washington's Arena Stage, The American Shakespeare Festival, The Welsh National Theatre, the BBC, the London Academy of Music and Dramatic Art, Coventry's Belgrade Theatre, Paris, Hollywood, East Berlin's Deutsches Theatre, Taiwan, the Socialist Republic of Armenia, and Poland. A partial alphabetized list would include Miriam Goldina, Boris Goldovsky, Henry Hewes, Mesrop Kesdekian, Marcel Marceau, Paul Massie, Siobhan McKenna, Olga Petrovna, Ben Piazza, Alan Schneider and Doug Watson.

Requirements for the B.A. degree. Total 180 hours

TAR MAJOR REQUIREMENTS: (total of 64 hours)

All students must take:

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Depending upon choice of concentration, additional requirements are:

PERFORMANCE:

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TECHNOLOGY AND DESIGN:

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And a choice of either all of:

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<td>TAR 463</td>
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<td>TAR 417</td>
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Special Requirements:

A. Courses inside or outside TAR department as suggested by TAR faculty or advisers as necessary for an individual student's progress; or additional Free Electives (see restrictions on page 93)............. 12 hours

B. When the student makes an initial declaration of major, a reading list will be presented. The list is comprised of plays, books and articles which the department considers essential to the general knowledge of majors. The student will be expected to read independently from this collection.

University and College of Fine Arts Requirements:

A. General Distribution Requirements (details on page 33)................................. 60 hours

B. Free Electives (up to 28 hours may be taken in TAR courses beyond major requirements)............. 35 hours

C. Special Requirements—courses in other departments in College of Fine Arts......................... 9 hours
MASTER'S LEVEL DEGREE PROGRAMS

The College of Fine Arts offers two master's level degree programs, the Master of Fine Arts (M.F.A.) in the Art department and the Master of Music (M.M.) in the Music department. The general University admissions requirements for graduate degree-seeking status and the regulations of the University governing graduate study are described beginning on page 43 in this bulletin. The general University application procedures are explained on page 12. When all of the information required for general acceptability into the University is received in the Graduate Admissions Office, the information gathered by that office will be forwarded to the appropriate department in the College of Fine Arts where the applicant's final acceptance or rejection is actually determined.

Master of Fine Arts Degree (Art)

The major concentrations, or areas of emphasis, available to graduate (M.F.A. seeking) art students are:

- DRAWING
- PAINTING
- SCULPTURE
- CERAMICS
- GRAPHICS
- (LITHOGRAPHY and/or INTAGLIO and/or SILKSCREEN)
- PHOTOGRAPHY
- CINEMATOGRAPHY and VIDEO

Procedure for Applying

For consideration of acceptance into the Master of Fine Arts degree program, it is required that the applicant submit a portfolio of his work directly to the Director of Graduate Studies in the College of Fine Arts. The portfolio usually consists of 35-mm slides for convenience in shipping, handling and presentation. Legitimate exceptions to this rule are naturally acceptable, such as when the applicant's work is comprised of film, or in such other obvious cases when the nature of the work does not lend itself to slides, or when the work can be displayed or presented more conveniently and/or more effectively by delivering it personally (with prior permission), to the Director of Graduate Studies in the College of Fine Arts, or when the work itself and/or additional work is requested by the Director to be sent or brought in. The "portfolio" should indicate a competent level of involvement in an area (or areas) of visual exploration and, when mailed, must be posted directly to the Director of Graduate Studies, College of Fine Arts, University of South Florida, Tampa, Florida 33620, with return postage in stamps, (please, no cash, checks or money orders!) in the amount deemed necessary for the return of all materials.

A personal interview with an applicant is sometimes (though infrequently) requested by the Art department when it is considered necessary (and reasonable) in order to arrive at a final decision regarding the applicant's acceptability into the graduate program. Travel in connection with any interview, requested by the art department or by the applicant, is naturally at the applicant's own expense. An applicant who would seek consultation with the Director of Graduate Studies, with the Art Graduate Committee, or with any other member of the art department for whatever reason and for whatever date or time would do well to write or telephone for an appointment in advance of his/her arrival on campus if at all possible.

The following are deadlines for receipt of all materials (letters of recommendation, letter of intent, and portfolio), in the Office of the Director of Graduate Studies, College of Fine Arts: February 1, (for consideration for admission for Quarters III, IV and I); May 1, (for consideration for admission for Quarters IV and I); November 1, (for consideration for admission for Quarters II and III). At this same time, the Office of Graduate Admissions must have received all transcripts from former institutions, the GRE scores and the Application for Admission. It is the applicant's responsibility to see that all required transcripts and GRE scores are received in the Office of Graduate Admissions in time for their processing only after which we are presented with the record of those credentials. Without those credentials in hand, we cannot consider an application. The applicant will be advised to allow at least one full quarter in order to permit processing within the system. (If applicable, see graduate admissions requirements on page 43 of this bulletin).

Applicants to the Master of Fine Arts Degree program are also required to submit three letters of recommendation, a letter of intent, and slides of their work for approval by a faculty committee. These materials must be submitted directly to the Director of Graduate Studies in the College of Fine Arts.

Requirements for the M.F.A. Degree:

General requirements for graduate admission are given on page 43.

A student may be accepted into the program with degree-seeking status either provisionally (conditionally) or fully (unconditionally). The provisionally admitted student may be required to be enrolled for one or two consecutive terms for the removal of a deficiency or to provide time to demonstrate a particular competency. At the end of a provisional period, the student's work will be reviewed by the art faculty, at which time the student will either (1) be allowed to continue in the program, with provisional status removed; or (2) be terminated from the program; or (3) be allowed an additional term of provisional status. Students accepted fully into the degree-seeking program initially will be given a calendar year in which to achieve "degree-candidacy" by faculty review. Neither the first term of a fully accepted degree-seeking student's enrollment nor any summer term may be used for a candidacy review, however. A student admitted into the degree program provisionally will not be permitted a candidacy review during the first term of his/her provisional enrollment. Such a student could be given a candidacy review during the second term of enrollment if he/she had been removed from the provisional status at the end of the first term, or could be reviewed simultaneously for both the removal of the provisional status and for candidacy consideration during the second term provided that he/she is not required...
to enroll for a third term in the provisional status. Students initially admitted provisionally also have a calendar year in which to achieve candidacy. All degree-seeking students are provided with two opportunities within the calendar year to achieve candidacy. If a degree-seeking student does not achieve candidacy on the second attempt, the student will then be terminated from the program.

Upon acceptance to candidacy, the student will select a committee of three faculty members who will assist in his progress toward the degree (at least two of the committee members must be from the student's discipline). There is no foreign language requirement for the M.F.A. degree. In spite of the seven-year rule generally applicable to the Master's Degree candidate (see page 47 in this Bulletin), the M.F.A. degree candidate is expected to be in planned continuous residence (enrollment for course work only in Summer Quarters not being required), regardless of the number of course credit hours carried in any given term, regardless of whether there be few, several, or many, and regardless of any per-term averaging pattern. If enrollment is not planned or made for any given term or terms during "continuous residence", the degree-seeking student must request in writing the College of Fine Arts for such absence. Violation of the written terms of a permitted leave of absence could result in termination from the M.F.A. program, at the discretion of the Director of Graduate Studies in the College. Absence from the program (failure to be actively enrolled for any term during "continuous residence", excluding any summer term) without explicit written consent of the Director of Graduate Studies in the College of Fine Arts could result in immediate dismissal from the program (absence without leave). Any violation of the terms of a provisional or conditional acceptance into the program could result in the termination from the program. Any student not meeting the requirements of the program otherwise, explicit or implicit, and who are not terminated by the provisions indicated above, may be placed on "pending" by a written notification to the Records Section in the Office of the Registrar from the Director of Graduate Studies in the College of Fine Arts.

The M.F.A. degree requires a minimum of 72 quarter hours. With the exception of: (1) ART 682 (Graduate Instruction Methods), which must be taken at least twice; and (2) ART 694 (Graduate Instruction Methods), which must be taken at least once, but which is limited to a cumulative total of 5 credits per student; and (3) the "Documentation" requirement, the course credits for which may be earned in either ART 681 (Directed Research), with only the appropriate number of credits commensurable to the work undertaken, submitted, and approved toward the degree; or earned in ART 699 (Thesis, Masters), under the same conditions; and (4) the "Presentation of Work" requirement, the credits for which are allowed within reasonable limits, according to the committee-imposed requirements and the enormity of the other aspects of the task undertaken—all of which above are generally required, the specific course structure of the student’s graduate program will be determined by the Director of Graduate Studies in the College of Fine Arts after appraisal of the student’s interests, capacities and background during his/her first term of residency. Major areas of study include drawing, painting, sculpture, ceramics, lithography, intaglio, silkscreen, photography and cinematography. Under normal circumstances, students will not be encouraged to diversify too broadly; nor will they be encouraged in specializing too narrowly; but students who plan to prepare themselves for college or university-level teaching will be advised to develop competencies in more than one area in the interest of the sort of flexibility expected to be sought by hiring institutions for the next ten years or more.

The graduate student must meet all of the stated prerequisites for any course into which he/she desires to enroll. The responsibility for seeing that all graduation requirements are met rests with the student. Although the Director of Graduate Studies in the College will generally coordinate and supervise the student’s registrations and direction in the College in the early stages of the student’s program involvement, the student’s graduate committee will be directly responsible for the student upon the student’s achievement of candidacy. The student’s graduate committee will be directly responsible for the satisfactory completion of all requirements for graduation. The student must be registered as a fulltime graduate student for at least two quarters of residency. The requirements for the M.A. Degree in Art Education are listed under the College of Education.

**M.F.A. Thesis Requirements**

The thesis required for the M.F.A. degree, while primarily a body of creative visual work (as opposed to the traditional written scholarly research document with standardized requirements), has other components and is developed in the following manner:

1. The production of the body of visual work for a Thesis Exhibition under the guidance of the student’s major professor (who will be the Chairman of the student’s graduate committee) and the two remaining faculty members on the student’s graduate committee.

2. The formally scheduled Thesis Exhibition itself. Although the reservation of desired available space and dates is arranged in advance of the Theses and Dissertations Coordinator, the body of thesis work to be presented must receive the final approval of the student’s entire graduate committee before there may be a Thesis Exhibition.

3. The Documentation of the Thesis Exhibition, which is not to be confused with "the thesis" as described in "Division of Graduate Studies", under "Master’s Degree" as being required to the required degree. Five sets of the documenting slides are normally required by the College for distribution and will be retained, the student bearing the expense.

a) A record in 35mm slides of each piece of work in the Thesis Exhibition when appropriate such as, in the case of paintings, sculptures, ceramics, etc. (obvious exceptions would be in the case of cinematography, video, etc.). Five sets of the documenting slides are normally required by the College for distribution and will be retained, the student bearing the expense.

b) A logically developed, well organized, clearly articulated, written documentation of the development of the Thesis work. Although there is no rigidly prescribed style or format, the written documentation should be conceived and designed to reveal rather than to conceal, to communicate rather than to preclude communication, and must provide supporting evidence of an aesthetic awareness and of a creative sensibility.

i) Thesis Development: Before midterm of the quarter prior to the graduation quarter, student should submit in written form an outline of the ideas, concepts to be dealt with in the thesis document and exhibition to his Graduate Committee.

The student’s Graduate Committee within a week will in turn:

a) meet with the student to discuss their recommendations and reactions to the student’s proposal.

b) these recommendations and reactions to be submitted to the student in writing.

It will be the student’s responsibility to act on these recommendations and to arrange meetings with the committee to review the development of the work and obtain their written approval for concerning of the oral and presentation of the work at least two weeks prior to the opening of the thesis exhibition.

Failing this written approval two weeks prior to
the scheduled opening of the exhibition, the exhibition will be postponed.

2) Thesis Orals: Held in conjunction with the exhibition during the first week of the Thesis Exhibition. Three faculty questioners will be selected by the student with approval of his committee and the questioners will be given copies of the written documents two weeks prior to the exhibition orals. Student will meet with his Graduate Committee and three questioners in a closed session with the remainder of the faculty members. A positive, constructive and careful examination of issues involved in the thesis/exhibition will take place. Those in attendance will be the candidate, committee, questioners and other members of the faculty, with the questioners and committee asking questions. If any clarifications to the thesis document/exhibition are indicated, agreement should be reached at this time as to the necessary revisions. The committee has the responsibility to seek the opinion of the faculty. Any questioner or member of the committee can request consultation with the full faculty. The committee will consider the advice of the faculty when they make their decision.

3) Thesis Exhibition: If at all possible, the thesis exhibition will be held for a period of two weeks during the quarter of intended graduation, but in no case will any exhibition be held until the third week of the quarter.

4) Open Dialogue/Thesis Exhibition: During the final week of the Thesis Exhibition, a specific time will be established for an open dialogue to take place within the gallery. This dialogue will be open to the public and might include undergraduates, graduate students and faculty. There should be a free flow of questions, answers and discussion in direct reference to the development of the exhibited work and the student will be responsible for leading the activity. The formal aspects of evaluation of the thesis document/exhibition will NOT take place at this time, but will have been resolved earlier within the Thesis Orals.

The signed original and four signed copies of the finally approved written documentation, together with slides, must be submitted for permanent retention before the degree approval.

4. The oral defense of the Thesis Exhibition accompanying the oral defense of the written documentation (as outlined above).

Master of Music Degree

The major concentrations available to graduate (M.M. seeking) music students are:
- performance
- composition
- theory
- choral conducting

Procedure for Applying

The applicant seeking acceptance into the Master of Music Degree program must meet the University's general admissions requirements and make formal application for general University acceptability with the Graduate Admissions Office. Concurrently, or even before, but certainly not appreciably later, the applicant must arrange to fulfill the specific acceptance requirements in the Music department (of the College of Fine Arts). Full acceptance can not be given until the applicant satisfies: (1) performance audition, (2) placement examinations in music theory-literature and piano. Dates and times for auditions and examinations may be obtained by telephoning or writing the Music department, College of Fine Arts. Persons to contact directly are the Chairman of the Music department and the Graduate Music adviser, or the Director of Graduate Studies (College of Fine Arts) for referral.

Requirements for the M.M. Degree:

General requirements for graduate work are given on page 47. In addition, the applicant for the Master of Music degree program will need to satisfy the following requirements in music before initial registration: (1) performance audition, and (2) placement examinations in music theory-literature.

The specific program for each student will vary according to his needs and interests. Each program must be approved by the student's adviser in conformance with the guidelines established by the Graduate Music Committee. A minimum of 54 quarter hours is required.

The responsibility for seeing that all graduation requirements are met rests with the student.
The major objectives of the College of Medicine are, first, to create and maintain an academic environment in which medical education, the production of new knowledge, and community service may be continued in a quality manner. The second objective is to integrate the College of Medicine into the mainstream of the community and to participate in and lead in the up-grading and improvement of the health care standards of the community in which the College is located. The third objective is to function within the framework of the total University as an integral and valued part of the University community.

The philosophy of the educational program at this institution is to provide a strong academic basis for lifetime scholarship in medicine and growth in professional stature for our students; to lay the foundation for the development of ever increasing technical and professional competency and proficiency in the arts and sciences of medicine for each of the students; to instill in our students compassion and a sense of devotion to duty to their profession and to their patients; to provide relevance and continuity in instruction among the various disciplines related to medicine; to maintain and increase our students' motivation for community and human service in the practice of their profession; to stimulate the students to accept major responsibilities in learning; to orient teaching activities around the student and his desire and ability to learn.

With these concepts in mind, a curriculum has been developed which we believe will achieve an effective correlation between the pre-clinical and clinical instructional areas. This curriculum is designed to emphasize conceptually oriented teaching, thus affording the students a challenging and intellectual experience as opposed to a routine and the superficial presentation of a large volume of facts. Relevance to medicine will be emphasized in all areas of instruction in a way recognizable and understandable by the student of medicine. Increased correlation on an interdisciplinary basis will be instituted providing reinforcement between the various fields of study. The curriculum will also provide a close and ongoing experience for the student in the day-to-day and continuing health care delivery system within the community hospitals and in ambulatory care facilities. It is anticipated the program will produce graduating physicians who understand and desire the practice of medicine as a fruitful and meaningful choice for a lifetime career of service to their patients and the community.

It is recognized that the program does place heavy demands upon the students. They will be expected to utilize all resources provided by the College, to maintain a consistent level of academic achievement, and to demonstrate evidence of initiative and dedication to their chosen profession.

**MEDICINE**

Students admitted to the College of Medicine, seeking an M.D. degree, are selected on the basis of what appears by present standards to be the best suited for the successful study and practice of medicine. The selection is made by the Admissions Committee composed of members of Pre-Clinical, Clinical and Volunteer faculty. Each applicant is considered individually and is judged strictly on his or her own merits. Characteristics evaluated include motivation, integrity, character, and general fitness. These are judged by recommendations of the applicant's Pre-Medical Advisory Committee as well as other letters of recommendation. The academic record and Medical College Admission Test furnish an estimate of academic achievement and intellectual competence.

Interviews are arranged for applicants whose qualifications appear to warrant complete exploration.

All inquiries concerning admission should be directed to the Associate Dean for Admissions, Office for Admissions, College of Medicine, University of South Florida, Tampa, Florida 33620.

**Requirements for Admission**

A minimum of three years of college or university work is required with some preference given to those applicants who present a bachelor's degree from a liberal arts college approved by one of the national accrediting agencies. The minimum requirement is three years of college work (90 semester hours or 135 quarter hours, exclusive of Physical Education and ROTC.)

Regardless of the number of years involved in Pre-Medical training, the college credits submitted by the applicant must include the following:

- One Year—General Chemistry, including laboratory
- One Year—Organic Chemistry, including laboratory
- One Year—Physics, including laboratory
- One Year—Biology, including laboratory
- One Year—Mathematics

All applicants must arrange to take the Medical College Admission Test.

**Requirements for Graduation**

The awarding of the degree Doctor of Medicine will follow successful completion of the entire required course of study. Appropriate arrangements for post graduate training must be made. Grading of performance in academic subjects will be on a pass, fail, honors grading system, and the student must have achieved a grade of at least pass in all subjects in the curriculum.

**Doctor of Philosophy Degree in Medical Sciences**

A graduate program leading to the Doctor of Philosophy degree in Medical Sciences is offered by the Basic Science Departments of the College of Medicine. Information concerning this program may be obtained by contacting the Graduate Coordinator, College of Medicine, University of South Florida, Tampa, Florida 33620.
Students in the College of Natural Sciences are trained in the tools of logical analysis and the modes of experimentation in the continuing attempt to better understand the nature of man and his relationship to the universe. In all its functions the College is dedicated to fostering a spirit of inquiry and intellectual growth.

In its seven departments, the College of Natural Sciences offers programs in astronomy; biology, including botany, microbiology and zoology; chemistry, and biochemistry; geology; marine science; mathematics and physics. These programs are designed for students planning scientific careers in the science fields or for those planning professional careers having a considerable component of science. These students will typically major in one of the sciences or in a combination of sciences as preparation for employment, transfer to professional schools or admission to graduate school.

In addition to the majors in science, the college administers the pre-medical sciences advising program and the medical technology advising program. These programs combine specialized counseling and curriculum planning to assist the student in gaining admission to a professional school or internship program.

**BACCALAUREATE LEVEL DEGREE PROGRAMS**

**Admission to the College**

To be admitted to the College of Natural Sciences a student must make written application and satisfy the admission criteria of the college. Upon admission, the student will be assigned a faculty adviser for counseling and program planning. Students preparing for a science or mathematics career must plan their courses carefully because of the sequential nature of the science curricula, and students seeking entrance into a professional school or medical technology internship program require specialized counseling. Because of this, immediate application for admission into the college is strongly recommended.

Information on admission criteria, departments, majors, programs, counseling, and other services of the college may be obtained from the office of the Dean or by contacting the Director of Advising, College of Natural Sciences, University of South Florida, Tampa, Florida, 33620.

**General Requirements for Degrees**

In addition to the University graduation requirements found on page 34, the requirements for graduation in any undergraduate degree in the college are as follows:

1. Completion of a sequence of courses constituting a major program. A major program is defined to be courses in a department of concentration plus supporting courses in related departments. All courses in the major program must be taken with letter grade except those courses which are graded S/U only.

A 2.0 grade point average must be achieved in courses in the department of concentration and a 2.0 grade point average must be achieved in the supporting courses of the major program. For a more detailed description of the major program requirements, consult the appropriate departmental section.

Certain courses offered in the college are designated "For non-majors," "No credit for (department) major," "No credit for science majors," or some similar phrase. For these courses the following rules apply:

"For non-majors"—For majors in the college, the course will count as credit towards graduation only as a free elective.

"No credit for (department) major"—the course will not count toward graduation for a science major in the specified department, but will count as credit towards graduation as a free elective for all non-specified departments.

"No credit for science majors"—the course will not count towards graduation for any major in the college.

2. Satisfaction of the University distribution requirement, except:

(a) In area III, the minimum requirement of eight hours in Mathematics may be waived by credit in at least eight hours of Mathematics courses required by the major.

(b) In area IV, the minimum of eight hours in Natural Sciences may be waived by credit in at least eight hours of natural sciences courses required by the major.

3. Completion of 24 hours of courses from the Colleges of Fine Arts, Social and Behavioral Sciences, or Arts and Letters. The student may elect any course from any of these colleges provided:

(a) The courses are approved by the student's adviser.

(b) No more than 12 hours are taken in courses in any one prefix.

Courses taken to satisfy the University distribution requirement may not be used to satisfy this requirement.

4. At least 45 credit hours with letter grades must be earned in the College of Natural Sciences.

5. At least 45 of the last 90 hours of undergraduate credit must be in residence in courses (with letter grades) at the University of South Florida. The approval of the dean must be secured for any transfer credits offered for any part of these last 90 hours.

Credits transferred from other schools will not be included in the grade point average computed for graduation.

For graduation with honors, see page 35.

Natural Science students are permitted to repeat a course only once under the Forgiveness Policy.

**Grading Systems**

Typically, courses in the University receive letter grades (A,B,C,D,F,I). However, the college recognizes that educa-
ational competence may be achieved and demonstrated by experiences other than classroom attendance leading to letter grades. The attention of the student is directed to the following:

1. CLEP and other advance placement examinations.
2. Waiver by either documentation or examination.
3. Off-Campus Term programs.
4. Cooperative Education Program.
5. Independent Study.
   A. With the exception of courses graded S/U only, all courses required to satisfy the departmental major and all supporting courses required by the departmental major are considered in the students' major program and may not be taken S/U. However, once the requirements of the major program have been satisfied, subsequent courses taken in the major or supporting areas are considered free electives and may be taken S/U. All hours required to complete the 24-hour rule must be taken by letter grade.
   B. With the exception of ENG 101, 102, 103 all courses in Distribution Requirements and all courses in free electives may be taken S/U. There is no restriction regarding the number of hours to be taken S/U except the graduation requirement that the student must earn at least 45 credit hours with letter grades in the College of Natural Sciences.
   C. Students will be permitted to enroll in a course by an S/U on the basis of a written contract signed by the student, and the instructor of the course. This contract should be completed no later than the third week of the quarter in which the course is offered.
   D. Each instructor for courses in the College of Natural Sciences will provide students with requirements necessary to attain an "S" grade. Essentially, "S" should be equal to a "C" or better.
   E. Students transferring from any other college or division of the University will be subject to the above requirements.

Programs Leading to the Baccalaureate Degree

The College offers the Bachelor of Arts degree with majors in Astronomy (AST); Biology (BIO), Botany (BOT), Microbiology (MIC), and Zoology (ZOO); Chemistry (CHM); Geology (GLY); Mathematics (MTH); Physics (PHY); and Interdisciplinary Natural Sciences (INS) with a concentration in one of the above. The College offers the Bachelor of Science degree with majors in Astronomy (AST); Biology (BIO), Botany (BOT), Microbiology (MIC), and Zoology (ZOO); Chemistry (CHM); Geology (GLY); Physics (PHS); and Interdisciplinary Natural Sciences (INS) with a concentration in one of the above. The College offers the Bachelor of Science degree with majors in Chemistry (CHS), Clinical Chemistry (CHC), Medical Technology (MET), and Physics (PHS). For specific requirements, consult appropriate departmental sections of this bulletin.

■ PRE-MEDICAL SCIENCES

Modern health care is a spectrum of functions ranging from diagnosis and treatment of disease to basic and applied research. As a result, there is a need for individuals with a diversity of educational backgrounds and a wide variety of talents and interests; and the student contemplating a career in the health sciences has an opportunity for service in a wide range of health care activities.

The pre-medical sciences program at the University of South Florida is administered by the College of Natural Sciences and is designed to assist students seeking entrance into a professional school in medicine, dentistry, veterinary medicine, or optometry. Through a combination of curriculum and counseling, the program is designed to enhance the student's intellectual, personal, and social development. Upon entrance into the program, the student is assigned an adviser for curriculum planning and counseling. While specific requirements may vary, all professional schools recognize the need for a well-rounded education; therefore, the goal is to develop a perceptive, knowledgeable citizen with a strong foundation in the natural sciences yet broadened and enriched with a solid background in the social sciences and humanities. Upon completion of the basic science requirements, the student is assigned to the Chairman of the Pre-Medical Sciences Committee. The function of this committee is to assist the student in all phases of application to the professional school of his or her choice. This includes letters of evaluation, admission applications, entrance examinations, etc. The student remains in the program until he or she is admitted to a professional school or seeks other alternatives, even if this extends beyond the baccalaureate degree.

Pre-Medical Sciences Program

The pre-medical sciences program provides a complete array of courses and educational experiences necessary for preparing oneself for admission to a professional school. Pre-medical science students should major in a discipline which is of the greatest appeal to them, whether it be in the sciences or non-science major, and fulfill all requirements in that major for graduation. The following science courses are the minimum requirements for admission to virtually every accredited professional school:

- One year of Biology: BIO 201, 202, 203.

Additional science requirements vary according to the professional school to which the student will be applying. Part of these additional requirements may be fulfilled by the following courses:

- Chemistry: CHM 321, 341, 351
- Mathematics: MTH 211, 212, 213, (or MTH 122, 123, 302, 303, 304)
- Biology: BIO 331, 401, 402, ZOO 311

Beyond the science course requirements, it is essential that students acquire an inventory of courses developing a sense of understanding of cultural and moral values, and basic social problems. It is understood that the quality of academic performance should be of the highest level.

It may be noted that well-prepared students with exceptional qualifications may be admitted to some professional schools as early as the completion of the junior year of pre-medical work.

B.A. Degree for Medical and Dental Students

Students who are admitted to a medical or dental school after completing their junior year at USF may be awarded the B.A. degree in Interdisciplinary Natural Sciences from the College of Natural Sciences subject to the following conditions:

1. Transfer of a minimum of 45 hours in science courses from an approved medical or dental school.
2. In attendance at the University of South Florida, the minimum requirements from the Interdisciplinary Natural Sciences major must be fulfilled as follows:
   A. 135 credit hours with at least a "C" average (2.0) in those credit hours completed at the University of South Florida.
   B. Completion of a sequence of courses constituting a major program with courses in a department of concentration and supporting courses in related departments. There must be a minimum of 36 credit hours in the discipline of major concentration and a minimum of 24 credit hours in supporting courses in the College of Natural Sciences outside the discipline of major concentration. The 36 credit hours in the discipline of major concentration must be in courses...
applicable to a major in that department (and the student must earn a 2.0 grade point average in these courses). The 24 credit hours in supporting courses must be taken in courses applicable to a major in that department and must include a minimum of three courses at the 300 level or above. The student must earn 2.0 grade point averages in all attempted course work of both major concentration and supporting courses, except for any courses graded S/U only, all courses must be taken by letter grade.

3. Credit in the following courses:
   BIO 201, 202, 203
   CHM 211, 212, 213, 217, 218, 219, 331, 332, 333, 334, 335, 336
   PHY 201, 202, 203, 204, 205, 206

GRADUATE LEVEL DEGREE PROGRAMS

Programs of graduate study are available in every department of the College of Natural Sciences. Students apply for graduate work through the College of Natural Sciences and are recommended for admission by the department in which they intend to concentrate. A departmental committee is appointed which supervises and guides the program of the candidate. The general University requirements for graduate study at the master's level are given on page 47, and for the Ph.D. degree on page 48. The specific requirements for each department are listed under that department below. For further information regarding admission and the availability of fellowships and assistantships a candidate should write to the appropriate departmental chairman, University of South Florida, Tampa, Florida 33620.

Master's Degree Programs

The College of Natural Sciences offers graduate programs leading to the Master of Arts degree in the fields of Astronomy (AST), Botany (BOT), Mathematics (MTH), Microbiology (MIC), Physics (PHY), and Zoology (ZOO); and a Master of Science degree in Chemistry (CHM), Geology (GLY), and Marine Science (MSC).

Doctor's Degree Programs

The College of Natural Sciences offers three programs leading to the degree of Doctor of Philosophy:

Biology (BIO)—This program leads to the Ph.D. in Biology, including the fields of Marine Biology, Systematics, Behavior, Ecology, and Physiology.

Chemistry (CHM)—This program leads to the Ph.D. in Chemistry, including the fields of Analytical, Biochemistry, Inorganic, Organic and Physical Chemistry.

Mathematics (MTH)—This program leads to the Ph.D. in Pure and Applied Mathematics.

TEACHER EDUCATION PROGRAMS

This major is particularly appropriate for Science Education majors (SCE). Prospective students should consult the College of Education portions of this bulletin under the heading “Science Education (SCE)” for the required education courses and sample programs.

Science Center
M.A. Degree Program for Secondary School Teachers:

The College of Natural Sciences in cooperation with the College of Education offers the M.A. degree in Mathematics (MAE) and in Science (SCE). In science, concentrations are available in Biology, Chemistry, and Physics. Because requirements exist in both colleges the student will have an adviser in each college. At the outset the planned courses in mathematics and science must be approved by the student's adviser in the College of Natural Sciences.

The University requirements for the M.A. degree are found on page 47. Mathematics majors must complete a minimum of 51 quarter hours; science majors must complete at least 27 quarter hours in the discipline of concentration. For requirements in education the student should consult the College of Education portion of this bulletin entitled “Master’s Level Degree Programs—Science Education (SCE).”

M.A. Degree Program for Junior College Teachers:

The M.A. degree program for junior college teachers is available in the College of Natural Sciences with specializations in astronomy, biology, chemistry, geology, mathematics, or physics. Students seeking certification to teach in the state of Florida may select either of the following options:

1. The student may complete the Master of Arts degree program in any department of the College of Natural Sciences and in addition enroll in at least 9 hours of Directed Teaching which is numbered 689 in the appropriate departmental course listing. The master’s degree program is normally 45 credit hours. University requirements for an M.A. degree are found on page 47. The specific departmental requirements are found under the appropriate departmental description of this portion of the bulletin.

2. The student may complete the M.A. degree in a program offered jointly by the College of Natural Sciences and the College of Education. This program requires 36 hours in mathematics or science specialization courses which must be approved by the student’s adviser in the College of Natural Sciences; 9 hours are required in Professional Education courses and 1-9 hours are required in internship depending on the amount of teaching experience of the student. For requirements in education, the student should consult the College of Education portion of the bulletin entitled “Junior College Teaching Program.”

CURRICULA

ASTRONOMY (AST)

The Department of Astronomy offers programs leading to the degrees of Bachelor of Arts and Master of Arts in astronomy. Students who graduate with an undergraduate degree in astronomy are expected to have a good foundation not only in astronomy but also in mathematics and physics, with the emphasis varying with the individual. They are also trained to become competent computer programmers. Employment opportunities exist at various government agencies, in private industry, and as teachers in public and private schools. Students who receive an undergraduate degree in astronomy will not necessarily continue to become professional astronomers. Because of the breadth of their education, astronomy majors can take up a variety of post-college careers including graduate study in astronomy, mathematics, or physics.

The graduate program leading to a master’s degree emphasizes specialization in various fields of astrophysics and astronomy. Most students continue to work for a master’s degree after receiving the bachelor’s. Employment opportunities at the master’s level exist in the same way as they do on the bachelor’s level. In addition the master’s degree is regarded at some educational institutions as a terminal degree for teachers on the junior college or sometimes even college level.

The Astronomy Department has at this time 6 faculty members, all of whom are actively engaged in original research. The facilities include a 26-inch Schmidt-Cassegrain telescope with a focal length of 30', as well as several smaller telescopes and auxiliary equipment. Faculty and students have access to the IBM 360-65 computer.

Requirements for the B.A. Degree:

1. Astronomy Courses (34 cr. hrs. of upper level courses minimum).

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AST 301</td>
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</tr>
<tr>
<td>AST 311</td>
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<tr>
<td>AST 443</td>
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<td>AST 302</td>
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<td>AST 312</td>
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</tr>
<tr>
<td>AST 303</td>
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<tr>
<td>AST 413</td>
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   A minimum of 8 cr. hrs. from:

<table>
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<tbody>
<tr>
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</tr>
<tr>
<td>AST 536</td>
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</tr>
<tr>
<td>AST 351</td>
<td>5</td>
</tr>
<tr>
<td>AST 522</td>
<td>4</td>
</tr>
<tr>
<td>AST 583</td>
<td>1-6</td>
</tr>
<tr>
<td>AST 414</td>
<td>4</td>
</tr>
<tr>
<td>AST 533</td>
<td>4</td>
</tr>
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   A minimum of 1 cr. hr. from:

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<tbody>
<tr>
<td>AST 481</td>
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II. Supporting Courses in the Natural Sciences (45-46 cr. hrs.)

<table>
<thead>
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<tbody>
<tr>
<td>MTH 302-305</td>
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<tr>
<td>MTH 401</td>
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</tr>
<tr>
<td>PHY 201-206</td>
<td>18</td>
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<td>PHY 301-306</td>
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</tbody>
</table>

   At least three of the following Physics courses:

<table>
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<tr>
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<tbody>
<tr>
<td>PHY 307</td>
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<tr>
<td>PHY 331</td>
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<tr>
<td>PHY 437</td>
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<td>PHY 309</td>
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<td>PHY 405</td>
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<td>PHY 541</td>
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<tr>
<td>PHY 323</td>
<td>4</td>
</tr>
<tr>
<td>PHY 407</td>
<td>3</td>
</tr>
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</table>

   At least one of the following Mathematics courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
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<td>MTH 311</td>
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<td>MTH 345</td>
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</tr>
<tr>
<td>MTH 447</td>
<td>4</td>
</tr>
<tr>
<td>MTH 323</td>
<td>4</td>
</tr>
<tr>
<td>MTH 445</td>
<td>3</td>
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</tbody>
</table>

III. General Distribution Requirements

   (60 cr. hrs. excluding waivers)

   The astronomy major must satisfy the General Distribution requirements of the College of Natural Sciences (See page 103).

IV. Liberal Education Electives

   The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (See page 103).

V. Free Electives (40 cr. hrs. maximum)

   The student is expected to familiarize himself with the techniques of programming electronic computers before the end of his sixth quarter.

   For students planning to attend graduate school, it is strongly recommended that they enroll in several courses numbered 500 or higher from group I above. They should also achieve a reasonable level of competence in at least one of three languages: French, German, or Russian.

Teacher Education Programs:

For information concerning the M.A. degree for junior college teachers, see above.

Requirements for the M.A. Degree:

General requirements for graduate work are given on page 47.
A minimum of 45 credits (excluding AST 694) must include at least 24 for courses numbered 600 or higher and at least 18 for structured astronomy courses numbered 500 or higher. It will be assumed that the student knows enough mathematics and physics to follow the astronomy courses required in his curriculum. No credit is available for courses numbered 499 or lower which the student takes in order to make up for his initial deficiencies in this respect. Since candidates for the graduate degrees in astronomy may have a variety of backgrounds, including majors in astronomy, mathematics, or physics, the required course of studies may vary considerably among students.

A thesis is required and must be based on original work. In lieu of the thesis, however, the student may be permitted to enroll for at least 8 additional hours on a level of 500 or above beyond the present requirements. It will be expected that the student will be assigned to a faculty member and perform research under this faculty member's direction. The student must also demonstrate, before the degree is granted, his ability to translate into English the pertinent scientific literature in at least one of the foreign languages: German, French or Russian. This last requirement may, in exceptional cases, be replaced by an equivalent one agreeable to the student and the department chairperson.

■ BIOLOGY (BIO/BOT/MIC/ZOO)

In addition to a set of basic courses in biology, students must have a thorough preparation in other areas of natural sciences in order to be competitive for jobs or for further study beyond the baccalaureate. A modern biology curriculum is built on a foundation of mathematics, chemistry and physics. Four specific Bachelor of Arts degrees (Biology, Botany, Microbiology, and Zoology) are available for students interested in the biological sciences. They are all preparatory for careers in teaching agriculture, medicine, dentistry, marine biology, biotechnology, or for post-graduate study in any of the various life sciences. Students should study the requirements listed below and then make maximum use of the vigorous advising program maintained by the Department in structuring their total program. A reading knowledge of a modern foreign language (German, French, or Russian) is strongly recommended for those who intend to enter graduate school.

Requirements for the B.A. Degree:

I. Department of Biology Courses
   A. Biology Core Courses (Required for all B.A. Degrees, 35 or 36 cr.)
      BIO 201-203 (12)
      BIO 331 (4)
      BIO 401-402 (10)
      BIO 445 (4)
   B. Individual Degree Requirements
      BIOLOGY MAJOR (BIO) (25 cr. hrs.)
      25 credit hours in BIO,BOT,MIC, and ZOO courses in consultation with adviser.
      BOTANY MAJOR (BOT) (25 cr. hrs.)
      BOT 300 (5) BOT 421 (0)
      BOT 311 (5)
      BOT 419 (5)
      Biology Department Electives (9)
      MICROBIOLOGY MAJOR (MIC) (25-27 cr. hrs.)
      MIC 351 (4)
      MIC 451 or MIC 456
      MIC 352 (2)
      BIO 558 (5/4)
      &
      MIC 401 (3)
      MIC 457 (4)
      MIC 402 (0)
      MIC 453 (4)
      MIC 491 (1)
   One of the following:
      BOT 417/MIC 518/BOT 543/ZOO 513 (3-5)

NOTE: Every microbiology major should obtain a recommended course sequence from a member of the microbiology faculty in order to avoid possible scheduling problems.

ZOOLOGY MAJOR (ZOO) (15 cr. hrs.)
   ZOO 422 (5)
   ZOO 313 (5)
   ZOO 423 (0)
   and
   Any one lab course in vertebrate biology (5)

II. Supporting Courses in the Natural Sciences (Required for all B.A. Degrees, 42 or 44 cr.)
   CHM 211-213; CHM 217-219 (12)
   or
   CHM 215-216 (10)
   CHM 331-334 (10)
   PHY 201-204 (10)
   MTH (12)
   (Three courses in mathematics chosen from the following to attain 12 credits: MTH 211, 212, 213; 302, 303, 304, 305, 310, 311, 323, 345)

III. General Distribution Requirements (Required for all B.A. Degrees, 60 cr.)
   Each student is required to satisfy the General Distribution requirements of the College of Natural Sciences (see page 103). The selection of courses within the requirement is to be done in conference with Biology Department advisers.

IV. Liberal Education Electives
   The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (see page 103).

V. Free Electives (including General Distribution waivers) can be taken over and above major requirements and major electives to complete a 180 hour program.

Teacher Education Programs:

For information concerning the degree programs for secondary school teachers and junior colleges, see pages 72, 77, and 80 of this Bulletin.

Marine Biology

The field of marine biology is especially important in Florida and there is a good demand for trained personnel. Several faculty members in the Department teach courses and conduct research in this area. Undergraduates interested in specializing in marine biology may do so by taking marine-oriented courses offered within the Department. Appropriate courses include ZOO 313 (Introductory Invertebrate Zoology), ZOO 519 (Ichthyology), ZOO 520 (Echinoderm Biology), ZOO 545 (Zoogeography), ZOO 557 (Marine Animal Ecology), BOT 543 (Phycology), and BOT 547 (Marine Botany). The Biology Department offers M.A. degrees and the Ph.D. degree which allows specialization in marine biology.

Requirements for the M.A. Degree:

General requirements for graduate work are given on page 47.

Major programs are offered in Botany, Microbiology, or Zoology. The M.A. degree may be obtained by completion of a research thesis or by appropriate substitution of structured courses and an approved paper. The satisfactory completion of all general requirements and those specifically stated below are the responsibility of the individual student.

The selection of a major professor must occur within the first three quarters after admission. Failure to do so will be cause for termination. The choosing of a major professor includes acceptance of the student by the faculty member. Until selection is accomplished, the departmental graduate coordinator will function as the student's adviser. The three-member supervisory committee, as approved by the departmental chairman and
Requirements for the Ph.D. Degree:

General requirements are given on page 48.

A doctorate program in biology is offered. Areas of specialization for the Ph.D. are marine biology, ecology (tropical ecology, population ecology, and physiological ecology), physiology (cellular physiology, microbial physiology, neurophysiology), systematics, and behavior. On admission to the Department for doctoral study, the student shall select a major professor from the departmental faculty for the direction of his program. Upon acceptance of the student by the faculty member and before the lapse of three quarters, a five-member supervisory committee will be named and approved by the Department chairman and College Dean. At least one member of the committee shall be from beyond the student’s area of specialization. This committee shall approve the courses of study, choice of language skills, and the supervision of the student’s research and dissertation.

It is expected that students will have had undergraduate training comparable to that of a USF undergraduate in biology. A departmental requirement of a minimum of 30 credit hours are required in formally structured graduate-level courses from more than one faculty member, as well as any additional courses necessary to the needs of the individual’s program as determined by the supervisory committee. A maximum of 9 hours of formally structured graduate-level courses may be transferred from other graduate institutions. Fifteen hours from the master’s degree program at USF may be applied toward meeting the above requirements with approval of the supervisory committee.

Some time before the end of the sixth quarter, a student must have demonstrated a reading proficiency in two foreign languages or approved special work. Language selection will be by the supervisory committee and testing by either the faculty of biology or foreign languages. After the language examination and before the end of the sixth quarter, the written portion of the departmental preliminary examination must be completed. The oral portion of the preliminary examination must be completed during the next academic quarter.

After completion of the above requirements, the student may be admitted to candidacy upon approval of the Dean of the College and the Director of Graduate Studies. One academic year of satisfactory service as a teaching assistant is recommended of all candidates. Also, a public seminar presentation of the dissertation during the final quarter’s work is required.

A final oral examination will be administered and evaluated by the supervisory committee. Emphasis will be upon the dissertation, the student’s mastery of his general field of research, and the application of fundamental biological principles to the dissertation. The examination is conducted by a neutral and non-voting convenor and the candidate shall be subject to questioning by any biology faculty member in attendance.

Graduate Application Deadlines:

Applications must be completed by March 10th for Quarter I applicants who wish to be considered for assistantships. All other applications must be completed by the fourth week of the quarter preceding the one for which you are applying.

CHEMISTRY (CHS/CHM/CHC)

The Department of Chemistry offers three degrees at the baccalaureate level, Bachelor of Arts degree in Chemistry, Bachelor of Science degree in Chemistry, and Bachelor of Science degree in Clinical Chemistry, and two degrees, Master of Science and Doctor of Philosophy, each with specialization in the areas of analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry, at the graduate level. The chemistry faculty is comprised of 30 full-time senior faculty members, all of whom hold the Ph.D. degree. A comparable number of teaching assistants, generally graduate students enrolled in the Ph.D. program, serve as instructors in the laboratories. The combination of a large and strong faculty with a wide variety of courses and electives provides students with programs of study which can be tailored to fit individual needs while maintaining a sound background in all general aspects of chemistry.

The Bachelor of Science degree in Chemistry (CHS) is a rigorous program which supplies the foundation in chemistry required for both the student who begins a chemical vocation immediately upon graduation as well as the one who pursues advanced study in chemistry or related areas. In accord with this goal the curriculum for the B.S. degree meets the requirements for degree certification by the American Chemical Society.

The Bachelor of Arts degree (CHM) provides a course of study designed for the student who does not intend to become a professional chemist but whose career goals require a thorough understanding of chemistry. Inherent in this program is a high
degree of flexibility which permits tailoring a course of study to the student's own educational objectives. As such it offers considerable advantages to pre-professional students planning careers in medicine and the other health-related fields and an excellent preparation for primary and secondary school teachers of chemistry or physical science.

A program leading to a B.S. degree in Clinical Chemistry (CHC) is offered by the Department of Chemistry. This program, one of only a few such programs in the country, is specifically designed to train personnel for this new and growing field of the medical profession; however, the strong scientific background and specific technical expertise provided by this program also afford the student an excellent preparation for graduate study in clinical chemistry, biochemistry, or medicine. Interested students should see the Coordinator of the Clinical Chemistry Program in the Department of Chemistry for further information.

In graduate work, the excellent physical facilities and very low student-teacher ratio combine to afford unique opportunities for advanced study in chemistry. In addition to the five traditional fields, analytical chemistry, biochemistry, inorganic, organic and physical chemistry, research opportunities are also available in such interdisciplinary and specialized areas as bioorganic and bio-inorganic chemistry, clinical chemistry, environmental chemistry, lasers and photochemistry, marine chemistry, organometallic chemistry, photoelectron spectroscopy (ESCA), polymer chemistry, and medicinal chemistry.

Requirements for the Baccalaureate Degree:

I. Chemistry Courses

| B.A. CHEMISTRY (CHM) (54 cr. hrs.) | CHM 211-213 | CHM 311 | 5 |
| and 217-219 | CHM 321 | 5 |
| or CHM 331-336 | 15 |
| CHM 215-216 (10) | CHM 341-343 | 8 |
| CHM electives (300 level or above) | (9) |

| B.S. CHEMISTRY (CHS) (65 cr. hrs.) | CHM 211-213 | CHM 331-336 | 15 |
| and 217-219 | CHM 351 | 4 |
| or CHM 441-443 | 12 |
| CHM 215-216 (10) | CHM 445-447 | 11 |
| CHM 291 | (1) | CHM 491 | 1 |
| CHM 321 | (5) | CHM 411 | 4 |

| B.S. CLINICAL CHEMISTRY (CHC) (66 cr. hrs.) | CHM 211-213 | CHM 441, 443 | 8 |
| and 217-219 (12) | CHM 485 | (5) | CHM 421 | (4) |
| or CHM 441-443 | 12 |
| CHM 215-216 (10) | CHM 423 | (4) |
| CHM 321 | (5) | CHM 425 | (4) |
| CHM 331-336 (15) | CHM 462 | (2) |
| CHM 351, 354 | (7) |

*CHM 215-216 (10) can be substituted for CHM 211-213 and 217-219 (12). This reduces by 2 the cr. hrs. of required chemistry courses in each degree program.

II. Supporting Courses in the Natural Sciences

| B.A. CHEMISTRY (CHM) (35 cr. hrs.) | MTH 212-213 | PHY 201-206 | 15 |
| Electives (except 370-379, 470-479 series) | (12) |

| B.S. CLINICAL CHEMISTRY (CHC) (54-61 cr. hrs.) | MTH 302-304 | EGB 204, 304 |
| PHY 301-306 | or 201-206(12-15) | ESC 301-302 | (3-6) |
| BIO 201-203 | 12 | PHY 422 |
| MIC 351 | (4) | or ZOO 423 | (5) | ETK 522 | (4-5) |

| B.S. CHEMISTRY (CHS) (32 cr. hrs.) | MTH 302-305 | PHY 301-306 | 12 |
| Electives (except 300-400 level except 371) | (3) |

III. General Distribution Courses

| (60 cr. hrs. excluding waivers) | The student is required to complete the General Distribution requirements of the College of Natural Sciences (see page 103). |

IV. Liberal Education Electives

The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (See page 103).

V. Free Electives* (Including General Distribution waivers)

| B.A. CHEMISTRY (CHM); 31 cr. hrs. |
| B.S. CHEMISTRY (CHS); 23 cr. hrs. |

The required sequence of Chemistry courses should be started immediately in the freshman year and the mathematics and physics requirements should be completed before the junior year so that CHM 341 (B.A. degree) or CHM 441 (B.S. degree) can be commenced at that time.

*Students taking CHM 215-216 must add 2 more hours of free electives.

Teacher Education Programs:

For information concerning the degree programs for secondary school teachers and junior college teachers, see pages 72, 77, and 80 of this bulletin.

Requirements for the M.S. Degree:

General requirements for graduate work are given on page 47.

All entering graduate students who have no advanced work beyond a B.A. or B.S. will be required to take the core courses in each of the five areas: Analytical, Biochemistry, Inorganic, Organic, and Physical Chemistry. This requirement can be waived by recommendation of the supervisory committee on the basis of past work, performance on a diagnostic test, or substitution of more comprehensive and advanced courses. The required core courses are CHM 512, CHM 532, CHM 542, CHM 555 and CHM 621.

Beyond the required core courses, the curriculum for a chemistry major will vary with the area of the thesis. The specific course requirements will be determined by the supervisory committee and the proposed research, in consonance with the regulations of the University.

In order to gain the experience that comes from teaching, satisfactory service as a teaching assistant for two academic years is required (unless a specific exemption is recommended by the supervisory committee).

Comprehensive Examination

Each student must pass the written comprehensive examinations in three of the five areas: Analytical, Biochemistry, Inorganic, Organic, and Physical Chemistry. Each examination will be administered by the faculty of that area and will be from one to three hours duration. Each examination will be graded by the members of the respective areas, each arriving at a fail-pass-high pass verdict. A student may repeat any or all of the examinations provided that 3 have been passed by the time five quarters have elapsed since enrollment as a graduate student. The exams (each 1-3 hours) are offered four times each year, once between each quarter (except in the summer when the exams will be offered the first week of QTR IV). Note that this requirement is to be completed before the beginning of the sixth quarter.

While it is anticipated that the core courses will bridge the gap between undergraduate and graduate courses, and will therefore help students prepare for the comprehensive examinations, it should be understood that the comprehensive examinations are general examinations in their respective fields, and not merely further examinations in the core courses.

Final Thesis Defense

Upon completion of the thesis research and preliminary approval of the thesis by the supervisory committee, the M.S.
candidate will be required to pass an oral examination conducted by the supervisory committee on the research. Final approval of the examination and of the thesis will require approval by the entire committee.

Requirements for the Ph.D. Degree:

General requirements for graduate work are given on page 48.

While there are no specific course requirements for the Ph.D. degree in chemistry, each student must take at least 16 hours of structured 600-level chemistry courses. No more than four hours of Graduate Seminar (CHM 691) may be used to satisfy this requirement. The candidate, with the help of the adviser and the approval of the supervisory committee, will design a program of study and research that will result in a mature and creative grasp of chemical science. Approval of the candidate's program will rest with the supervisory committee.

While there are no specific course requirements for the Ph.D. degree, beginning graduate students who plan to circumvent the M.S. degree are advised to take the core courses or their equivalent.

In order to gain the experience that comes from teaching, satisfactory service as a teaching assistant for two academic years is required (unless a specific exemption is recommended by the supervisory committee).

Qualifying Examination

The Qualifying Examination requirement for the Ph.D. degree will be the same as the comprehensive examination for the M.S. degree except that the Ph.D. candidate must pass the examinations in four out of five areas, and must also pass two of these examinations (one of which is in the major area) "with distinction." In other words, the Ph.D. candidate must demonstrate a very real grasp of the fundamentals in the major area and one other area (probably related to the major area, but not necessarily so). As in the case of the M.S. requirements, a student may repeat any or all examinations, provided that four have been passed, two "with distinction," by the time five quarters have elapsed from enrollment as a graduate student. The exams are offered four times each year, once between each quarter (except in the summer when the exams will be offered one time). As noted earlier, the exams must be taken by one of the following first week of QTR IV. Again, it is to be noted that this requirement, as for the M.S. degree, must be completed before the beginning of the sixth quarter. The Qualifying Examinations shall be given in the form of one to three hour examinations in each of the five areas—analytical, biochemistry, inorganic, organic, and physical.

What is anticipated that the core courses will bridge the gap between undergraduate and graduate courses, and will therefore help students prepare for the qualifying examinations, it should be understood that the qualifying examinations are general examinations in their respective fields and not merely final examinations in the core courses. Qualifying examinations should be attempted by students as soon as possible. These examinations are intended to test for broad and basic knowledge in each area at the Bachelor of Science level.

Language Examinations

Before a student is eligible to qualify for candidacy for the Ph.D. degree, a reading knowledge of the chemical literature in any two of the languages—German, Russian, and French (or any other language approved as appropriate by the supervisory committee) must be demonstrated; or a reading knowledge in one of these languages and proficiency in a skill or specialization outside the discipline of chemistry must be demonstrated. The latter could include (1) proficiency in computer programming; (2) advanced specialization in mathematics, physics, biology, geology, or any other appropriate area pertinent to scholarly work in chemistry; (3) any other field of advanced study or proficiency deemed appropriate by the supervisory committee. The language requirement may be demonstrated by the following: (1) reading knowledge in two foreign languages as demonstrated by a test to be specified; (2) reading knowledge in one foreign language and some other proficiency such as computer programming; (3) in-depth knowledge of one foreign language (speaking and reading knowledge); (4) three quarters of a foreign language at the college level with a minimum of C grade in each quarter may be taken. If two foreign languages are taken, the language requirement is fulfilled; (5) periodic translations to be administered by the student's supervisory committee.

The language requirement must be met one year before graduation.

Major Comprehensive Examination

A comprehensive major examination will be required of Ph.D. candidates sometime after satisfactory completion of the qualifying examination. This examination must be taken one year before graduation.

Advancement of Candidacy

Completion of all the foregoing requirements admits the student to candidacy for the Ph.D.

Final Thesis Defense

When the Dissertation Committee has inspected the final draft (final unbound form: typewritten and ready for duplication with the exception of possible minor corrections) of the dissertation and finds it suitable for presentation, the Chairperson will complete a form requesting the scheduling and announcing of the final oral examination. The request form will be submitted via the appropriate department chairperson to the college dean and the Director of Graduate Studies for approval. The final oral examination must be held at least three weeks before the end of the quarter in which the student is to be awarded the degree. The required copies of the completed dissertation signed by the Committee must be received by the Director of Graduate Studies at least two weeks before the end of the quarter.

The Chairperson of the examination committee shall be appointed by the Dean of the College and shall not be a member of the student's Dissertation Committee or the department or program in which the program is sought.

The candidate may expect questions concerning the details and significance of the research after the oral presentation which is open to the public. Final approval of the candidate's degree will require approval by a majority of the supervisory committee, which shall include the Chairperson of the oral presentation.

GEOLOGY (GLY)

Geology is one of the broadest of all sciences because of its dependence on fundamentals of biology, chemistry, mathematics, and physics as applied to the study of the earth. As a result, undergraduate students are expected to obtain a broad background in the other sciences as well as a concentration in geology. This bachelor's degree program is designed to provide the geology major with a broad foundation that will prepare him for employment in industry or with various governmental agencies as well as the necessary training to continue study in graduate school.

The graduate program in geology allows the student to specialize in nearly all of the major areas of concentration. Because of the geographic and geologic location of the University in a rapidly expanding urban center of coastal Florida, there are a number of areas of specialization which are being emphasized. These include coastal geology, hydrogeology, low temperature and pollution geochemistry, geology of carbonate rocks and phosphate deposits. All of these are closely related to local problems of the environment.

In addition to the staff in the Department of Geology, there are a number of geologists on the faculty in the Department of Marine Science located in nearby St. Petersburg. Close ties are maintained between the two departments and students interested in marine aspects of geology are encouraged to take advantage of this situation for both course work and research.
Requirements for the B.A. Degree:

I. Geology Courses (49 cr. hrs.)
- GLY 210 (4) GLY 361 (4) GLY 412 (4)
- GLY 211 (4) GLY 405 (4) GLY electives (12)
- GLY 212 (4) GLY 410 (4)
- GLY 302 (5) GLY 411 (4)

II. Supporting Courses (35-41 cr. hrs.)
- CHM 211-213, 217-219 (12) PHY 201-206 (15)
- or
- CHM 215-216 (10) PHY 301-306 (12)
- or
- MTH 211 and 212 (8)
- or
- MTH 123 and 302 (8)

Plus one additional course in mathematics, statistics, or computer science as approved by the student’s adviser.

III. General Distribution Courses (60 cr. hrs. excluding waivers)

The student is required to satisfy the General Distribution requirements of the College of Natural Sciences. See page 103.

IV. Liberal Education Electives

The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (See page 103.)

V. Free Electives (Including Distribution waivers) (41-47 cr. hrs.)

The student will choose, in consultation with his Geology adviser, such courses in the College of Natural Sciences that support his major interest within the field of Geology. A foreign language, preferably French, German, or Russian, is strongly recommended, especially for those students who anticipate continuing for a doctorate in graduate school. All geology majors are strongly urged to attend a summer field camp.

An entering student anticipating a major in Geology is advised to enroll in GLY 210, 211, 212 and CHM 211, 212, 213, 217, 218, 219, in the freshman year and to seek curriculum counseling with a Geology adviser.

Teacher Education Programs:

Prospective elementary and secondary school teachers desiring to teach science should include basic courses in Geology and related sciences as part of their curriculum. For information concerning the M.A. degree program for junior college teachers, see page 80.

Requirements for the M.S. Degree:

Requirements for admission to the Division of Graduate Studies and general graduate curriculum guidelines are given on pages 43-47.

Students are admitted for graduate work in Geology if they present the requisite background in Geology and supporting sciences. The bachelor’s degree with a major in Geology or a major in other sciences with strong supporting program in geosciences is required. Students who wish to enter the graduate program in Geology without the proper background will be required to take some undergraduate courses without receiving credit toward their master’s program. In addition, a formal summer field course is strongly recommended.

The curriculum for a Geology graduate student will vary depending on the area interest and thesis topic of the individual. A minimum of 45 credit hours (excluding GLY 694) is required for the master’s degree of which a minimum of 24 credits must be in courses numbered 600 or above. All graduate students must take Graduate Seminar (GLY 691) at least twice. Although a written thesis in the student’s field of specialization is normally required, an equivalent amount of course work in Geology may be substituted if the program is approved in advance by the graduate committee of the Department. Satisfactory performance on a comprehensive examination covering the student’s course work and thesis is also required.

INTERDISCIPLINARY NATURAL SCIENCES (INS)

The Bachelor of Arts in the Interdisciplinary Natural Sciences major is designed for majors in an interdisciplinary program in the college and for majors in Science Education and Mathematics Education. For information on teacher certification in science or mathematics, prospective teachers should consult the section entitled Teacher Education Programs on page 105, and also consult the College of Education section of this bulletin.

The requirements for graduation for this degree are the same as those contained on page 103 except that item 1 of the requirement is altered as follows:

1a. Completion of a major program consisting of a minimum of 68 hours in College of Natural Sciences courses. In these hours there must be a minimum of 36 credit hours in a discipline of major concentration and a minimum of 24 credit hours in supporting courses in the College of Natural Sciences outside the discipline of major concentration. All courses in the major program must be applicable to a major in that department and must have the approval of the student’s adviser. At least three of the supporting courses must be at the 300 level or above.

The student must earn 2.0 grade point average in all attempted course work of both major concentration and supporting courses and must complete at least 45 hours after acceptance into the major, all of which must have prior approval of his adviser.

MARINE SCIENCE (MSC)

Some of the most important research currently being carried out in the Gulf of Mexico is centered at the University’s Department of Marine Science. There, biologists, chemists, physicists and geologists work together to bring greater understanding of not only the Gulf but all the seas of the world. The department offers courses leading to a master’s degree in Marine Science. Degree candidates study and work with the researchers who have made the department’s Bayboro St. Petersburg headquarters a major ocean research center. The research interests of the department are widespread and include interdisciplinary studies of estuarine environments, shelf and deep water investigations, hydrodynamic modelling, nutrient cycles, benthic ecology, mariculture, and marine policy. The department has excellent research and classroom facilities on the downtown St. Petersburg waterfront, including a fleet of small vessels ranging from 16 to 36 feet in length.

Marine scientists traditionally specialize in one of four basic research areas: marine biology, marine chemistry, marine geology, or marine physics. Thus, while the degree program in Marine Science is at the master’s level, students may prepare for graduate work by obtaining a baccalaureate degree in one of these four areas. By a suitable choice of marine oriented elective courses, a major in Biology, Chemistry, Geology, or Physics can be an excellent vehicle for entry into a graduate program. Potential marine sciences majors should consult with an undergraduate adviser concerning these baccalaureate majors.

The field of Marine Science is destined to grow rapidly in all its subdivisions and offers great opportunities for individuals as our use of the sea expands.

Requirements for the M.S. Degree:

General requirements are given on page 47. A minimum
of 45 credits (excluding MSC 694) must include MSC 521, 531, 541, and 551 unless the student, as determined by this graduate committee, has had the equivalent of one or more of these courses.

The student may emphasize biological, geological, chemical, or physical oceanography through his thesis research and course work. A thesis is required but a foreign language is not.

Courses taken in addition to those required are determined by the area of specialty in consultation with the student's graduate committee. Normally, a student entering this program spends one or two quarters in residence at the Tampa campus taking courses in those departments most closely related to his specialty. Following course work at the Tampa campus, the student will usually move to St. Petersburg to complete his course work and thesis research. Admissions materials for students entering Qtr. I should reach the department by March 15. For students entering Qtr. II, III, or IV materials should be in by October 15 for admission sessions in late March and October respectively.

## MATHEMATICS (MTH)

The Department of Mathematics offers a diversity of courses designed not only to enable the student to pursue a profession in mathematics itself, but also to enhance his competence in the fields of engineering, the physical sciences, the life sciences, and the social sciences. The Department offers programs leading to the B.A., M.A., and Ph.D. degrees. The undergraduate program emphasizes the broad nature of modern mathematics and its close association with the real world. The program is designed to prepare students for entry into graduate school or careers in industry or secondary education.

The Department has a flexible Ph.D. program which is designed to encourage students to take an active role in the shaping of their own curricula. This flexibility is coupled with a desire to promote interdisciplinary research. In cooperation with the Departments of Astronomy, Marine Science and Physics, and the Colleges of Engineering and Medicine, the Department offers special Ph.D. programs in the applications of mathematics.

The Department is composed of four areas of concentration. These areas are as follows:

1. **Algebra and Topology**
   - Number theory, algebraic coding theory, general topology, topological semigroups.
2. **Analysis**
   - Abstract harmonic analysis, abstract measure theory, approximations and expansions, functional analysis, geometric function theory.
3. **Applied Mathematics and Computer Science**
   - Asymptotic methods, differential equations, integral equations, numerical analysis.
4. **Statistics and Stochastic Systems**
   - Biomathematics, theory of probability and statistics, reliability theory, stochastic modeling in the life sciences and engineering, stochastic systems and time series.

There are 34 faculty members in the Department and about 50 graduate students. The graduate program is young and still in the developmental stage. While programs in the more traditional areas of pure mathematics are offered, the Department is committed to emphasizing applied mathematics at both the graduate and undergraduate levels. For both undergraduate and graduate work students and faculty have access to the university's computer, an IBM 360/365.

### Requirements for the B.A. Degree:

The courses taken to satisfy the Group I and Group II requirements below will constitute the major program referred to in the general graduation requirement of the College of Natural Sciences.

**I. Mathematics Requirements (47 cr. hrs.)**

Majors must complete at least 47 credits in mathematics courses above the 100 level, including MTH 302 (5), 303 (4), 304 (4), 305 (4), 309 (3), and 323 (4). In addition, except for majors in mathematics for teaching, the following sequence is required: MTH 405 (3), 406 (3), and 407 (3). Majors in mathematics for teaching must have MTH 423 (3), and 424 (3).

Suggested upper level courses for a major in mathematics are:

- MTH 401 (4)
- MTH 511 (4)
- MTH 531 (4)
- MTH 445 (3)
- MTH 520 (4)
- MTH 547 (3)
- MTH 447 (4)
- MTH 523 (4)

Variation in course selection for special needs is to be done in consultation with the appointed adviser.

**II. Mathematics Related Courses (21-26 cr. hrs.)**

Majors, except for majors in mathematics for teaching, must take PHY 301-302, 303-304, and 305-306 and one of the following sequences:

1. AST 301, 302, 303.
2. BIO 201, 202, 203.
3. CHM 211, 212, 213, 217, 218, 219, or CHM 215-216.
4. GLY 210, 211, 212.
5. EGB 301, 202 and one of EGB 301 or 323.
6. EGB 311, 312, 313.
7. EGB 321, 322, and one of EGR 311 or 315.
8. EGB 340, 341, 344.
9. EGB 350, 300, 311, 312.

Majors will not receive credit toward graduation for the following courses: AST 371, PHY 371, EGB 231, EGB 331, EGB 433, EGB 331. Majors wishing to take a course which requires a knowledge of statistics should take MTH 345.

**III. General Distribution Courses (60 cr. hrs, excluding waivers)**

Majors must satisfy the General Distribution requirements of the College of Natural Sciences, which must include (or show competence in) one of the following sequences:

- FRE 101, 102, 103
- GER 101, 102, 103
- RUS 101, 102, 103

**IV. Liberal Education Electives**

The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (See page 103).
The following is a suggested course program for the first two academic years:

<table>
<thead>
<tr>
<th>Fall Quarter (I)</th>
<th>Winter Quarter (II)</th>
<th>Spring Quarter (III)</th>
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<td>MTH 122, 123</td>
<td>MTH 302</td>
<td>MTH 303, 309</td>
</tr>
<tr>
<td>Sophomore Year</td>
<td></td>
<td>Two MTH electives</td>
</tr>
</tbody>
</table>

Students with a strong background in high school mathematics may omit either or both MTH 122, 123 with the consent of the chairman.

Teacher Education Programs:
For information concerning the degree programs for secondary school teachers and junior college teachers, see pages 72, 77, and 80 of this Bulletin.

Requirements for the M.A. Degree:
General requirements for graduate work are given on page 47.

A thesis is optional. The thesis program requires a minimum of 45 credits of course work (excluding MTH 694), of which the thesis may carry three to nine credits. The non-thesis program requires 45 credits of course work. In either case, 24 hours of the course work must be taken in courses numbered 600 or above and the program must total at least 45 credits.

The course of study is flexible and interdisciplinary work is encouraged.

The areas of specialization include the following:
- Algebra and Topology
- Analysis
- Applied Mathematics and Computer Science
- Statistics and Stochastic Systems

Each candidate for the M.A. degree is required to pass a written examination in three of the following subjects:
- Algebra (MTH 511, 523, 524)
- Applied Statistical Methods (MTH 525, 526)
- Complex Analysis (MTH 520, 521 or MTH 540, 521)
- Differential Equations (MTH 501, 502, or MTH 541, 542)
- Probability Theory (MTH 545, 546)
- Real Analysis (MTH 513, 514)
- Topology (MTH 531, 532)

Each examination will cover the prescribed contents of the courses listed above.

A reading knowledge of either French, German or Russian is encouraged. Computer Science may be substituted for the language requirement.

For specific program requirements, the student should consult the Department Chairman.

Requirements for the Ph.D. Degree:
In addition to the general University requirements for the Ph.D. degree, on page 48, the Mathematics department requires the following:

1. Qualifying Examinations
   Each doctoral student must pass at the Ph.D. level a written examination in four of the subjects listed under the Requirements for the M.A. degree.

2. Foreign Language Requirements
   Each student must pass an examination in two of the three languages: French, German or Russian. Computer Science may be substituted for one of the languages.

3. Course Requirements
   The student’s program of study must meet the course requirements for the M.A. degree. Other course requirements will be determined by the student’s Supervisory Committee.

4. Specialization Examination
   This examination shall be administered by the student’s Supervisory Committee after he has passed the qualifying examinations, the language requirements, and has completed all course requirements. The composition and scheduling of this examination shall be determined by the Supervisory Committee and may be written and/or oral.

5. For specific program requirements, the student should consult the chairperson of the Department of Mathematics.

6. The student must submit a dissertation to be approved by the Supervisory Committee.

MEDICAL TECHNOLOGY (MET)

Medical Technology is one of the growing professions associated with the advances in modern medical science. Working in the clinical laboratory, the medical technologist performs chemical, microscopic, bacteriologic, and other scientific tests to help track the cause and treatment of disease. This talent requires specialized training and a baccalaureate degree is essential preparation for certification as a medical technologist.

The University of South Florida offers a four-year program leading to the Bachelor of Science degree in Medical Technology. A student electing to major in Medical Technology will spend the first three years of the program on the campus of the University of South Florida; the fourth year (12 months) will be spent in one of the affiliated hospitals or clinical laboratories. Admission to the fourth year is limited by the number of openings in the affiliated hospitals. Selection of interns is made by the hospitals.

During the first three years, the medical technology student will complete the liberal arts and basic science requirements for entrance into the fourth year of the program for clinical training. To remain in good standing as a Medical Technology major during this period, a reasonable grade point average, determined by the College of Natural Sciences, must be maintained. To be eligible for entrance into the program’s fourth year, the student must have completed not less than 135 credit hours of work (excluding physical education courses). Of these hours, at least 30 credit hours must be from the College of Natural Sciences at the University of South Florida (in courses approved by the Director of the Medical Technology Program). The following courses must be included in the three years of work which precedes the fourth year of clinical training:

1. Biological Sciences
   A minimum of 24 hours is required with at least one course in microbiology. Physiology (ZOO 371 or 423) is strongly recommended.

2. Chemistry
   A minimum of 24 hours is required including organic chemistry. Biochemistry (CHM 351) and Elementary Analytical Chemistry (CHM 321) are strongly recommended.

3. Physics
   A minimum of 12 hours (one full-year majors-type course) is required.

4. Mathematics
   One course in mathematics (above the level of MTH 110) is required. A year of math or its equivalent is strongly recommended.

5. General Distribution Requirements
   Courses satisfying the general distribution requirements of the College of Natural Sciences.

6. Courses in non-science fields to insure a broad background.

Upon successful completion of this curriculum, recommendations by the College, and acceptance by one of the affiliated hospitals or clinical laboratories the student will complete 12 continuous months of training at that hospital or laboratory.
This training period usually begins in early August or September of each year. During this period, one will continue to be registered as a full-time student of the University and will receive a total of 45 credit hours of work in MET 311, 431, 432, 442, 451, 453, 454, and 485. These courses will be taught at the hospital or clinical laboratory. Students successfully completing this program will be granted a Bachelor of Science degree in Medical Technology.

PHYSICS (PHY/PHS)

The Department of Physics offers programs leading to a Bachelor of Arts or a Bachelor of Science degree, and to a Master of Arts degree. Both thesis and non-thesis programs are available for the M.A. degree.

Undergraduate course offerings of the Department provide a well-balanced program covering virtually every area of physics. Special courses may be offered upon sufficient demand. Modern, excellently equipped classrooms and laboratories provide an outstanding environment for students. Opportunities for undergraduate students to participate in research projects with professors and graduate students form an integral part of the undergraduate experience. Undergraduate students have engaged in research efforts to the extent that their work has been published in scientific journals. There is a tradition of close working relationships between professors and students.

At the graduate level, thesis research areas include theoretical and experimental plasma physics, theoretical and experimental solid state physics, experimental gaseous electronics, elementary particle theory, and biophysics. Supporting facilities include an IBM 360/75 computer, an excellently equipped machine shop and electronic shop, a glass blowing shop, an electron microscope, and an x-ray photoelectron spectrometer. Teaching assistantships and financial aid through the College Work-Study Program are often available to qualified students. A study hall is available where students may obtain help with their course work at their convenience throughout each week day.

Requirements for the Baccalaureate Degree:

I. Physics Courses

| B.A. PHYSICS (PHY) 45-51 cr. hrs. | \n| --- | \n| PHY 201-206, 315 (18) PHY 309 (4) or* PHY 409 (3) | \n| PHY 301-306 (12) PHY 419** (3) | \n| PHY 307 (3) PHY 341 (2) | \n| PHY 308 (3) PHY 441 (2) | \n| PHY 417** (3) PHY Electives (10) | \n| B.S. PHYSICS (PHS) 55-62 cr. hrs. | \n| PHY 201-206, 315 (18) PHY 423 (3) or* PHY 331 (4) | \n| PHY 301-306 (12) PHY 405 (3) | \n| PHY 307 (3) PHY 437 (3) | \n| PHY 308 (3) PHY 421 or PHY 417 (3) PHY 517 or PHY 409 (3) PHY 419 (3) or PHY 501 (4) PHY 341 (2) or PHY 541 (3) PHY 441 (2) |

II. Supporting Courses in the Natural Sciences

| B.A. AND B.S. PHYSICS—(28-33 cr. hrs.) | \n| --- | \n| CHM 211-213 MTH 302-305 (17) and 217-219 (12) MTH 351-354 (14) | \n| CHM 215-216 (10) MTH 401 (4) | \n
*Credit will not be given for both general physics sequences PHY 201-206 and PHY 301-306.

**With the consent of the Physics Adviser, either or both of the following substitutions may be made: PHY 437 for PHY 417 and PHY 331 for PHY 419.

III. General Distribution Requirements

(60 cr. hrs. excluding waivers)

The student is required to complete the General Distribution requirements of the College of Natural Sciences (see page 103). Selection of a foreign language, preferably French, German, or Russian, is also strongly recommended.

IV. Liberal Education Electives

The student must satisfy 24 hours of liberal education electives as described in item 3 of the graduation requirements of the College of Natural Sciences (see page 103).

V. Free Electives (Including General Distribution waivers)


B.S. PHYSICS (PHS): 37-49 cr. hrs.

Teacher Education Programs:

For information concerning the degree programs for secondary school teachers and junior college teachers, see pages 72, 77, and 80 of this Bulletin.

Requirements for the M.A. Degree:

General requirements are given on page 47. When a student is admitted to the graduate program in physics, he will consult with the Graduate Physics Adviser, who will be his course adviser and will also keep a close check on the progress of the student in his work. After a decision has been made concerning the student's academic goals, the duties of the Graduate Adviser will be assumed by a Supervisory Committee appointed by the department chairman. The Supervisory Committee will have the right and the responsibility to add special requirements to meet any deficiency in the student's background.

The student desiring the M.A. degree with a thesis is required to take a minimum of 45 credits no more than nine of which may be for PHY 681, 691, and 699. Of these 45 credits, 24 must be in courses numbered 600 or above. Required courses are PHY 537, 541, 607, 631, and 641. The Supervisory Committee will administer a comprehensive examination before recommending that a degree be granted.

The student desiring the M.A. degree without a thesis is required to take a minimum of 45 credits (excluding PHY 694), no more than three of which may be for PHY 681 and 691. Of these 45 credits, 24 must be in courses numbered 600 or above. Required courses are PHY 541, 542, 543, 605, 606, 633, 637, and 641. The Supervisory Committee will administer a written and an oral comprehensive examination before recommending that a degree be granted.
New College, a former private liberal arts college, became a part of the University of South Florida in 1975, retaining its distinctive academic program and the status of an honors college within the greater University.

New College attempts to provide an educational environment that will allow students to obtain maximum academic and personal development. The curriculum is designed to promote their self-direction and to supply them with the knowledge and skills necessary for their careers. New College is both traditional and contemporary in its orientation: dedicated to humane learning, but also purposely seeking the discovery, the development, and the creation of ways to equip man for survival in a fluid society.

During its 12-year history, New College fostered a constantly evolving program with faculty and students ever alert for better ways to nourish individual growth. Students are encouraged to develop their own educational plans—using the educational contract—that will help them reach individual goals. Flexibility, individualism, and broad freedom of choice characterize the program, giving to each student the opportunity to play a major role in the constructing of his or her own program.

The Academic Calendar and Residence Requirements

New College operates on a slightly different academic year than the rest of the University. The College's academic year is divided into three 10-week terms beginning in September and ending in June with a special four-week period intervening in late fall designed specifically to permit students to accomplish independent studies.

Since students at New College are selected for their ability to benefit from the special New College program, they are considered, at entrance, to have the ability to begin at an advanced state of preparation. Therefore, New College offers each student the opportunity to earn a bachelor's degree in three academic years, or nine terms, of residence. However, each student also has the option to distribute his educational experience over a four-year period by taking several terms off from study at selected times during those four years.

Educational Contracts

The basic instrument of the New College educational program is the educational contract, a written document constructed at the beginning of a term by each student and expressing that student's plans for the ensuing term.

Each contract states the individual student's educational and personal goals for the term and possibly longer range objectives; a listing of the specific educational activities that will help accomplish these ends; and an explanation of how those specific educational activities will be evaluated at the end of the term.

Each contract is developed by the individual student as an expression of personal education and career goals, but faculty are expected to contribute substantially to help students determine the best ways to shape contracts to reach goals.

Residence Halls, Sarasota Campus
Admissions Requirements

New College welcomes applications from all qualified students without regard to nationality, creed, race, or sex. New College seeks those students who are unusually well-qualified to thrive in its intellectual and social atmosphere. The College uses a variety of indicators to help each student measure whether he or she is right for participating in this special program. The most reliable index of this ability remains past scholastic performance.

Student Scholastic Aptitude Tests (SAT) combined scores range from 1100 to 1600 with the average falling near 1200. The experience of students over the past 11 years has demonstrated that those whose combined scores fall anywhere within that 1100 to 1600 range are capable of succeeding at New College, provided they also have the personal characteristics that will allow them to cope effectively with the educational program. These individual traits, in addition to motivation, are initiative, tenacity, maturity, curiosity, concern for others and an excitement about life and learning as essential attributes.

Residents of the state of Florida may submit results of the Florida 12th-grade testing program, the Scholastic Aptitude Test from the College Entrance Examination Board, or scores received from the American College Testing Program (ACT) to help the Admissions Office of New College determine whether a student should be selected for any class.

Since the program at New College has been deliberately designed to fulfill the needs of individual students, it follows that the College will also accept students with varied academic preparation. The College does not require that certain courses be completed to gain admittance, but does urge prospective students to complete the customary courses within a college preparatory program before enrolling at New College. Particular attention is given to students who have participated in honors courses, advanced placement, or enriched and accelerated courses and independent studies.

Advanced placement provided at some institutions is not necessary for admission to New College of USF simply because admissions procedures are designed to assure that all students will be able to function at an advanced level. The fulfillment of this expectation is facilitated by the mutual effort of each student and his academic adviser to design a program that takes the abilities of the individual student and his previous preparation into consideration. Students are encouraged to begin studies at advanced levels, if they have adequate background.

Application forms and literature may be obtained from the Director of Admissions, New College of USF, 5700 N. Tamiami Trail, Sarasota, Florida 33580. Prospective students should note that a supplemental application is needed for admission to New College.

Application Deadlines:

Fall Term/Term I: Application should be completed before March 1 and no later than April 1. Application for financial assistance should be received before February 1.

Winter Term/Term II: Application should be completed by November 1.

Spring Term/Term III: Application should be completed by February 1.

Degree Requirements

All students who are graduated from New College of USF receive a Bachelor of Arts degree. However, students may elect to concentrate in any of a number of areas within the various divisions or to elect an interdisciplinary course of study in fields of their own shaping. Requirements for completion of a course of study at New College include satisfactory evaluations on nine educational contracts, on four independent study projects, on the senior project, and on the baccalaureate examination.

Areas of Study

New College is divided into three academic divisions—Humanities, Social Sciences, and Natural Sciences—and students may elect to study primarily in one area, to distribute their studies throughout the entire three divisions, or to create special interdisciplinary curricula which span offerings in any of the disciplines.

To aid prospective students of New College, each division has indicated broad areas of study which are available in each division. Within each area there are, of course, many subdivisions and information about these may be obtained from the New College Records Office.

### Humanities
- Art History
- Fine Arts
- Music
- Literature

### Natural Sciences
- Mathematics
- Biology
- Chemistry

### Social Science
- Anthropology
- Political Science
- Economics
- Sociology
- History
- Social Psychology

### Special Programs

New College has two special programs which are available to students of New College but which fall outside of the regular divisional or interdisciplinary areas.

The Environmental Studies Program is an interdisciplinary and interdivisional program that is also expected to integrate academic and “real world” experiences in problem-solving situations. Students who elect the Environmental Studies Program may develop disciplinary knowledge and skills through courses and seminars in the College’s three academic divisions and then may apply their knowledge and skills in research...
projects dealing with practical problems in environmentally
related areas.
Each year, for three weeks in June, the New College
Summer Music Festival is held on campus. The Festival brings to
the campus a number of nationally and internationally known
musicians to teach and to perform public concerts with emphasis
on chamber music. Qualified New College students may enroll in
Festival classes while Festival concert performances are open to
everyone in the college community. Students for the Festival are
drawn from all parts of the country and abroad coming to the
college to study each year and also to perform in student
concerts which are held frequently on campus. New College
students have the opportunity to audit Festival master classes and
rehearsals and also to attend the public concerts.

Costs
Costs for attending New College of USF are the same as those
for attending any part of the State University System. Costs are
based on a per-credit hour basis (see page 18 for University
credit-hour costs). Each term's educational contract is the
equivalent of 16 credit hours while the independent study project
is equivalent to four credit hours.
Since New College offers students the opportunity to have a
more individualized type of study than is available in other
University programs, it is easily seen that such a program would
be more expensive. To help meet this difference in cost, a
private organization, the New College Foundation, has agreed to
provide an annual subsidy of private funds to the university
system to make up the difference of state funding and the actual
cost of the educational program. These funds are raised by the
New College Foundation and its Board of Trustees from
individuals, corporations and foundations.

### 1976-77 ACADEMIC CALENDAR

#### NEW COLLEGE OF USF

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<th><strong>Spring Term (III), 1977</strong></th>
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<td>April 1, Thurs.</td>
<td>Feb. 1, Tues.</td>
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<td>Sept. 6, Mon.</td>
<td>March 28, Mon.</td>
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<td>Sept. 8-11, Wed.-Sun.</td>
<td>April 1, Fri.</td>
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<td>Sept. 13, Mon.</td>
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<td>Sept. 17, Fri.</td>
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<td>Sept. 24, Fri.</td>
<td>May 30, Mon.</td>
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<td>Nov. 1, Mon.</td>
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<td>Nov. 19, Fri.</td>
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<td>Nov. 22, Mon.</td>
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<td>Nov. 26-27, Thurs.-Fri.</td>
<td>June 11, Sat.</td>
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<td>Dec. 17, Fri.</td>
<td>Commencement</td>
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**Winter Term (II), 1977**

| | |
| Nov. 1, Mon. | Deadline for applications |
| Jan. 3-4, Mon.-Tue. | Orientation and advising |
| Jan. 5, Wed. | Classes begin |
| Jan. 7, Fri. | Last day to withdraw and receive refund of term fees |
| Jan. 12, Wed. | Contracts due |
| Jan. 14, Fri. | Last day for contract submission for Winter Term* |
| March 1, Tues. | Deadline for declaring option or off-campus study for Spring Term† |
| March 15, Tues. | End of Winter Term |

### Student Life

New College is essentially a residential institution with the
majority of the students living either on campus or in the
surrounding community. Students are challenged to accept
major responsibilities for the direction of their own affairs,
including their social and extra-curricular activities. A Student
Affairs Office is an essential part of New College and is
concerned with almost all phases of student life from orientation
of arriving students to commencement plans for those ready to
depart. Student Affairs, through its professional staff, is
responsible for counseling, housing, recreation and health
services. Staff also are concerned with helping students assume
responsibilities in relation to others on campus and in the outside
communities.

All first-year students live on campus during their initial
academic year. Upper-class students may choose College or
non-College residency and all students have the option of taking
advantage of using the college food service plan or of making
independent arrangements for meals.

New College offers counseling for students in several
different areas. New College provides for students a small health
center on campus, staffed while the college is in session.
Excellent specialized medical services are readily available in
the community with a community hospital only minutes away
from campus. Qualified clinical psychologists provide for
students a broad range of psychological counseling and therapy
as well as dealing with students concerned about life goals,
academic and career decisions, and study skills. Professional
medical and psychiatric counsel is available in the community at
the student's expense.
COLLEGE OF NURSING

The College of Nursing is committed to the improvement of nursing and health care services through its education programs, community service and related research activities. The College offers a National League for Nursing accredited upper division program in nursing that leads to a Bachelor of Science degree with a major in nursing. The program provides two curricula: 1) Curriculum A for generic students (qualified students with no previous preparation in nursing) and 2) Curriculum B for registered nurses who are graduates of diploma and associate degree programs.

Applications from all qualified students are accepted without regard to age, sex, cultural, racial, religious or ethnic background. Qualified students with no previous preparation in nursing and registered nurses who are graduates of associate degree and hospital programs are admitted.

Student may meet all requirements at the University of South Florida or they may complete lower division prerequisites elsewhere and transfer to USF for the nursing major. Students who enroll at the first or second year level at USF are admitted to the Division of University Studies. They meet the same requirements as other applicants for admission to the University and should follow the admission procedures outlined elsewhere in the Bulletin. College graduates and transfer students from other nursing programs are also eligible for admission to the major.

The practice of professional nursing involves problem-solving and decision-making based on knowledge from the humanities and the physical, biological, social and behavioral sciences. Shortages of qualified personnel, technological advances and increasing demands for health care services have brought changes in the functions and responsibilities of those in the health care professions. As a result, nursing practice has become increasingly complex and demanding in terms of knowledge and skills required to assume added responsibilities and functions. The goal of this program is to provide students with opportunities to develop cognitive, affective and psychomotor skills basic to general nursing practice in any setting where professional nursing services are provided: acute care hospitals, community health agencies, extended care facilities, industry, physicians' offices, military health services, the American Red Cross, and so on. The program also focuses on interpersonal and leadership skills essential to meeting their responsibilities as citizens and as professionals in the health care system. An additional goal is that of assisting students to establish investigative and independent study habits that will persist throughout a lifetime of professional growth and development.

The undergraduate program is approved by the Florida State Board of Nursing and graduates of this program are eligible for admission to examinations leading to licensure to practice as professional nurses in the State of Florida or to apply for licensure in other states. Graduates also have the educational background necessary for graduate study in nursing to prepare for expanded roles in clinical nursing practice or for teaching, administration, research and other leadership responsibilities.

Admission to the College

The College of Nursing is a quota program in that limitations are set on enrollments on the basis of availability of sufficient qualified faculty, laboratory and classroom facilities, and clinical resources for nursing practice experience for students. Therefore, admissions are upon a selective basis through special application directly to the College of Nursing. Florida residents are given priority. One class is admitted to Curriculum A in the fall quarter of each year. The deadline for acceptance of applications is February first. Applications may be obtained by contacting the Coordinator of Advisement, College of Nursing.

Transfer students seeking admission to the College of Nursing follow the procedure outlined for transfer students in the USF Bulletin and the procedure outlined here for admission to the College of Nursing. All transfer students must apply for admission to the University and be accepted prior to acceptance by the College of Nursing. Transcripts certifying completion of all requirements for admission must be available to the College of Nursing before admission will be confirmed. Applications for admission to the University may be obtained by contacting the Office of Admissions, University of South Florida, Tampa, FL 33620. Applications are accepted throughout the school year. Applications are given priority. Qualified students with no previous preparation in nursing and registered nurses who are graduates of diploma and associate degree programs are admitted to the Division of University Studies. They meet the same requirements as other applicants for admission to the University and should follow the admission procedures outlined elsewhere in the Bulletin. College graduates and transfer students from other nursing programs are also eligible for admission to the major.

Transfer students seeking admission to the College of Nursing should submit an application to the College of Nursing. These applications will be sent upon request.

The academic requirements used as a basis for evaluating eligibility of applicants for admission to the upper division major are outlined below. The applicant should realize that these are minimum requirements and that applicants are rated in addition with regard to a number of factors relevant to completion of the program and to professional nursing practice.

A. OVERALL REQUIREMENTS (CURRICULUM A)

The requirements listed below are not enforceable until 1977/78 under the Articulation Agreement between the State Universities and Public Community Colleges in Florida. However, these changes were instituted for the students' benefit and allow for maximum flexibility while still...
maintaining academic standards. Students applying prior to 1977 may elect to meet the requirements as listed in the University of South Florida Bulletin under effect at the time the student initially enrolled, provided that enrollment has been on a continuous basis.

1. Completion of 90 quarter (60 semester) hours of college level work with a cumulative average of "C" or better. Credit received on the basis of CLEP examinations or other appropriate procedures may be included as part of these requirements.

2. Completion of the University of South Florida general education distribution requirements as part of the above. These requirements may be satisfied by the completion of 60 quarter (40 semester) hours in the following areas with not less than 8 quarter hours (6 semester hours) in each area:

   1) English Composition
   2) Humanities
   3) Mathematics/Quantitative Methods
   4) Natural Sciences
   5) Social Sciences

   Students with an A.A. degree will be considered to have met the above requirements.

In the specific course requirements for the nursing major, certain courses are required in the natural sciences and in the social and behavioral sciences. These courses will also apply toward meeting the general education distribution in the natural and social sciences. In addition, the courses taken in statistics or quantitative methods which have content in these areas are also acceptable.

3. At least one of the above must include laboratory or have a corequisite laboratory course for which the student received credit.

4. Microbiology: completion with a "C" or better. (USF: MIC 351 or BIO 372). Courses taken at another institution will be evaluated individually on the basis of content included.

5. Completion with a "C" or better, of at least one of the following: anatomy, nutrition (USF: NUR 302, or satisfactory completion of the correspondence course offered by the University of Florida), human growth and development (USF: HUS 427 or a combination of PSY 341 and AGE 301 or PSY 403 and AGE 301). Courses taken at another institution will be evaluated on an individual basis.

6. Social and Behavioral Sciences:
   a) One course in American government (e.g., USF: POL 200, 201, 360, 448, 411) or modern American history (e.g., USF: HTY 212, 306, 307). Courses taken at another institution will be evaluated individually on the basis of content.
   b) Completion, with a "C" or better, of at least four courses in the areas of individual and social/community behavior with at least one course in each area. Any courses in psychology and sociology as well as human growth and development, group dynamics, aging studies, cultural issues, etc., are acceptable. Courses with education prefixes which have content in these areas are also acceptable.

7. Statistics or Quantitative Methods: completion of at least one course in mathematics and one course in statistics or quantitative methods.

All applicants whose applications indicate eligibility for admission are required to be interviewed by College faculty prior to a decision regarding acceptability.

Factors given consideration in evaluating applicants include: cumulative grade point average; grade point average in the specific course requirements (biology, chemistry, social sciences, microbiology and the supporting sciences); substantive changes in academic performance in general education and prerequisite sciences; extent to which applicant meets or exceeds minimum requirements; progress toward completion of A.A. or higher degree in another field; extracurricular, civic, military or employment activities; evidence of commitment to the health field; health status; and ability to communicate (assessed by interview and short essay required at time of interview).

Those applicants with the highest total rankings are accepted in order until the class quota is filled. As vacancies occur prior to the enrollment date, those next on the list are accepted to fill them. Enrollment of all students is contingent upon verification through official transcripts of satisfactory completion of all the minimum requirements outlined above.

B. OVERALL REQUIREMENTS (CURRICULUM B)

1. The academic requirements for admission to Curriculum B, which differ somewhat from those for Curriculum A, because consideration is given to previous preparation and experience, include the following:
   a. An overall "C" average for all prior college level work attempted.
   b. Eligibility to return to last institution attended.
   c. Current licensure to practice as a registered nurse.

2. Registered nurses from hospital schools may be admitted to the major after completion of 45 hours in the general education distribution (described under Curriculum A) with no less than 8 quarter hours in each of the five areas. This policy, which differs from that in effect for generic students, has been developed to provide more flexibility for registered nurses in moving through the program on a part-time basis. However, admission to the College does not insure enrollment in those courses that have supporting science prerequisites.

3. Registered nurses with an Associate of Science or Associate in Arts degree in nursing are eligible for admission to the major providing they have met general education distribution requirements as described above.

4. Registered nurses who possess an Associate of Arts degree (other than in nursing) are eligible for admission to the University and will be considered to have met general education distribution requirements of the University. However, the College requirements in mathematics, social and behavioral sciences, and physical and biological sciences must be met prior to graduation.

5. Registered nurses may receive up to 20 hours of credit for previous nursing education and/or experience or satisfactory performance on proficiency examinations. These credits will be allocated as elective credits and will not apply toward meeting the University requirement of 60 upper division credits or toward meeting the requirements of the upper division nursing major.

6. Priority for admission is given to Florida residents who are currently engaged in the practice of nursing
in the State or who have practiced during the past five years and plan to return to practice upon graduation.

**General Education Requirements**

All registered nurse applicants must have completed 45 quarter (30 semester) hours in general education with not less than 8 quarter (6 semester) hours in each of the five areas prior to enrollment in the major. These credits may be obtained by any one or any combination of the methods listed below:

1. Successful completion of the work at an approved college or university. Students with an A.A. degree (other than in nursing) will be considered to have met these requirements.
2. Successful performance in College Level Examination Program general tests and appropriate subject examinations. College regulations permit up to 67.5 hours in advanced standing credit (including 45 hours of the general distribution requirement) for successful performance on CLEP examinations.
3. Successful performance on the Standardized Subject Matter Test (USST), a United States Armed Forces Institute Examination.

There are specific course requirements for graduation with a B.S. degree with a major in nursing which are also applicable toward the general education distribution. While not all of these are required for admission to the major, some are prerequisite to courses in the major. With careful consideration to program planning, the student may meet these major requirements and at the same time meet requirements of the general education distribution. These requirements are outlined below:

1. **Mathematics**—a total of 8 quarter hours, including one course in general mathematics or college algebra and one course in elementary statistics or quantitative methods.
2. **Social sciences**—a total of 18-24 quarter hours with at least one course in American government or modern American history and a minimum of four courses in individual and social/community behavior (at least one course in each of these areas). All courses must be completed with a grade of "C" or better. Courses in psychology, sociology, cultural and medical anthropology, gerontology, behavioral sciences, growth and development and life cycle may apply toward meeting this requirement. (Students may CLEP general psychology, growth and development, American government and American history).
3. **Physical and biological sciences**—a minimum of 18-20 quarter hours must be earned, but this requirement can be met through many different combinations of basic and/or advanced physical and biological science courses. All courses taken toward meeting this requirement must have been completed with a "C" or better.

**Program Leading to the Baccalaureate Degree**

The College of Nursing offers one undergraduate program with a major in nursing (NUR).

**Degree Requirements**

Students are certified for the Bachelor of Science degree with a major in nursing upon completion of 180 quarter hours of credit distributed among the general education distribution, supporting sciences, minimum requirements of the major and electives. A cumulative grade point ratio of 2.0 or better must be maintained throughout the program. At least 60 quarter hours must be upper division level work (courses numbered 300 or above). Overall requirements, which differ for Curriculum A and Curriculum B, are outlined below:

**CURRICULUM A**

The clinical nursing courses emphasize wellness as well as illness and focus on prevention of disease and maintenance of health as...
The required nursing theory and clinical practice courses are as follows:

- NUR 340 (4) NUR 353 (5) NUR 451 (3-5)
- NUR 350 (4) NUR 403 (3) NUR 458 (5-7)
- NUR 351 (5) NUR 412 (1-5) NUR 483 (2-12)
- NUR 352 (4) NUR 450 (5)

Nursing courses for both Curriculum A and B include substantial theory and nursing practice in care of the physically and mentally ill, the young and the old, the acutely and chronically ill. They also provide opportunities for learning in health maintenance, preventive and rehabilitative services and for functioning as members of nursing and health care teams in highly responsible and complex patient care settings. Learning experiences in nursing are developed and guided by registered professional nurses with graduate preparation in clinical nursing. Nursing practice experiences are provided in a variety of institutions and agencies involved in the delivery of nursing services.

Electives

The number and kinds of electives taken will depend upon the number of credits needed to fulfill the 180 quarter hour requirement for the degree and upon individual interest and goals. They may be chosen by the student from language, literature, fine arts, natural science, etc.; from areas relating to nursing roles and relationships—e.g., management, health education, mental retardation, gerontology, urban problems, race relations, women's studies, biological or physical sciences, social or behavioral sciences, statistics; or from NUR 483, Special Topics in Nursing.

Special Requirements for Nursing Majors

Tuition and fees for students enrolled in nursing are the same as for other undergraduate students at the University of South Florida. However, there are substantial expenses not covered by the basic tuition and fees. Textbooks, laboratory manuals and standardized tests are essential tools for students enrolled in the nursing major. Texts in nursing are somewhat more expensive than those in general education, and it is estimated these costs run from $35.00-$50.00 per quarter. Since texts are used over the two year major, these costs are somewhat higher at the junior level.

Uniforms including watch with sweep second head, scissors, shoes, stethoscope, etc., are required after the first quarter of the junior year. Uniform specifications and policies have been developed by students elected in the first class and costs vary depending upon personal choice. In addition, lab coats or aprons are necessary during the first quarter.

Medical care insurance is required. Professional liability insurance is highly desirable for all and required for registered nurse students.

An annual physical examination is required. The first one must be done before enrollment in courses involving patient contact in Quarter II of the junior year.

Transportation to and from community health agencies for clinical nursing experience is also the responsibility of the student. Since public transportation in the Tampa area is not usually convenient to the hours of clinical schedules, students must have access to some other means of transportation or form car pools. Also, from time to time, field trips to an institution or agency at some distance from the campus will be required for an entire class or section of a class. In these instances, students making the trip share the costs.

Financial Aid

Policies and procedures pertaining to financial aid are the same for students in nursing as for other students. Specific information can be obtained from the Office of Financial Aid, Student Affairs, University of South Florida, Tampa, Florida 33620.
The social and behavioral sciences are concerned with human beings and their development, problems, behavior, and institutions. The study of man helps the student to understand the world of which he/she is a part, to become a more informed citizen, and to prepare for a role in contemporary society. The social and behavioral sciences provide the student with knowledge, experience, and background for future application in business and industry, government, human service professions, and graduate education.

Three programs in the college—Urban Community Psychology, Gerontology, and Urban Anthropology—have been approved by the Board of Regents as Programs of Distinction. Although the programs are housed respectively in the Department of Psychology, the Aging Studies Program, and the Department of Anthropology, they utilize faculty expertise from many disciplines. Approval has been requested to extend the Program of Distinction to include Communicology, Criminal Justice, Geography, Political Science, Rehabilitation Counseling, and Sociology to further emphasize the human sciences and services. Students majoring in these areas receive distinctive educational experiences in both university and community settings.

BACCALAUREATE LEVEL DEGREE PROGRAMS

Admission to the College

Admission to the College of Social and Behavioral Sciences is open to students who have been accepted to the University of South Florida and who declare a major in a particular field within the college.

Undergraduate students must submit a formal application for admission to the college. This application is available in the Office of the Coordinator of Advising. Students will then be counseled by an academic adviser in his/her major field. Information about majors, departments, programs, advising, and other services of the college may be obtained from the Coordinator of Advising, College of Social and Behavioral Sciences, University of South Florida, Tampa, Florida, 33620.

Any student in the University may take courses in the College of Social and Behavioral Sciences. Students in other colleges or adults in the community may select social and behavioral science courses of particular interest.

General Requirements for Degrees

The College of Social and Behavioral Sciences currently offers two undergraduate degrees: Bachelor of Arts and Bachelor of Social Work. Requirements for graduation (referred to on page 34) are summarized as follows:

1. 180 credits with at least a “C” average (2.0) in courses taken at the University of South Florida. At least 60 of these 180 credits must be in courses numbered 300 or above. (A maximum of four credits of physical education courses may be counted toward graduation requirements; no credits in physical education are required.)
2. 60 hours of general distribution courses as required by the University in the areas of English Composition, Fine Arts and Humanities, Mathematics and Quantitative Methods, Natural Sciences, and Social and Behavioral Sciences. (See General Distribution Requirements, page 33).
3. Completion of a major in a subject or an integrated major, with at least a “C” average (2.0). (See following pages for requirements in specific majors offered in the college.)
4. 120 credits outside the major, including 90 credits outside the College of Social and Behavioral Sciences. These requirements are designed to insure breadth of academic experience.

5. Credits transferred from other institutions will not be included in the computation of the grade point average for graduation. To be eligible for graduation with honors requires at least a 3.5 average in USF work and all previous college work.
6. A student must complete at least 45 of the last 90 credits in academic residence at USF. The approval of the dean of the college granting the degree must be secured for any transfer credits offered for any part of these last 90 hours.

Students are encouraged to consult with an academic adviser in his/her major. It must be noted, however, that the student assumes full responsibility for satisfying all University, college, and departmental requirements for graduation.

Programs Leading to the Baccalaureate Degree

The College of Social and Behavioral Sciences offers a major in 14 fields as described in the following pages. In addition to the departmental majors, interdisciplinary majors are offered. (See Interdisciplinary Social Sciences, International Studies, and Social Science Education listed below.) Economics offers two majors, one in the College of Social and Behavioral Sciences and the other in the College of Business Administration.

A Bachelor of Arts Degree is offered in the following:

- Afro-American Studies (AFA)
- Anthropology (ANT)
- Anthropology-Linguistics (ANL)*
- Criminal Justice (CIP)
- Economics (ECN)
- Geography (GPY)
- History (HTY)
- Interdisciplinary Social Sciences (SSI)
- International Studies (INT)
- Political Science (POL)
- Psychology (PSY)
- Sociology (SOC)
- Social Science Education (SSE)**

A Bachelor of Social Work Degree (SOK) is also offered.

*Offered jointly with the College of Arts and Letters
**Offered jointly with the College of Education.
GRADUATE LEVEL DEGREE PROGRAMS

Master's Degree Programs

Graduate level courses are now offered in most social and behavioral science areas. The Master of Arts Degree is offered in the following:
- Anthropology (ANT)
- Criminal Justice (CJP)
- Geography (GYP)
- Gerontology (AGE)*
- History (HTY)
- Political Science (POL)
- Psychology (PSY)
- Rehabilitation Counseling (REH)
- Post-Baccalaureate
- Rehabilitation Counseling (REF)

*Offered by the Aging Studies Program

In addition to the Master of Arts degree offered from the College of Social and Behavioral Sciences, joint degrees are offered with the College of Education in Social Science Education, School Psychology, and the Junior College Teachers' Program. The Department of Communicology (formerly Speech Pathology and Audiology) in the college offers a Master of Science Degree in the following:
- Audiology (AUD) Post-Baccalaureate
- Audiology (AUF) 5-year program
- Aural (Re) Habilitation (ARH) Post-Baccalaureate
- Aural (Re) Habilitation (ARF) 5-year program
- Speech Pathology (SPP) Post-Baccalaureate
- Speech Pathology (SPF) 5-year program

Doctor of Philosophy

The Department of Psychology offers a program leading to the degree of Doctor of Philosophy.

SPECIAL NON-DEGREE PROGRAMS

The AGING STUDIES undergraduate program consists of a core of courses designed for interested students. These courses are AGE 301, 325, 405. Additional information will be found in the Aging Studies Program section of the catalog.

The LEISURE STUDIES PROGRAM is concerned with leisure in its broadest sense and provides a core of courses for interested students. This program is presently housed in the Department of Interdisciplinary Social Sciences, and the courses are listed under Social Sciences (Interdisciplinary) (SSI) as SSI 413, 421, 522, 523, 525.

The OFF-CAMPUS TERM PROGRAM offers a wide variety of opportunities for self-designed, supervised educational experiences for credit. This program is presently housed in the Department of Interdisciplinary Social Sciences, and the courses are listed under Off-Campus Term (OCT).

PROGRAMS AND CURRICULA

AFRO-AMERICAN STUDIES

Afro-American Studies Program provides a quality undergraduate education leading to a Bachelor of Arts degree in Afro-American Studies. Essentially it is a service program which provides opportunities for all students to broaden the bases of their knowledge of the entire human experience and intercultural understanding so essential to living in a multi-racial society and a world that has become a global village. It provides a new horizon in liberal education that seeks reunification of the knowledge of human experience and strikes at the narrowness and ethnocentrism of the traditional disciplines which have contributed much to race prejudice and misunderstanding. Part of its mission is to assist its black student clientele to achieve a more dignifying identity and fuller participation in the mainstream of American life. It attempts to help them to develop a greater awareness of themselves and their talents and to provide them educational and research opportunities necessary for the acquisition of understanding of political and economic realities and tools that must enable black people and other minorities to become effective determinants of their own political and economic life.

Requirements for the B.A. Degree:

The major in Afro-American Studies consists of a minimum of 56 hours in the field specified as follows:

- AFA 230 (4) AFA 334 (4) AFA 336 (4)
- AFA 333 (4) AFA 335 (4)

Required Core Courses (20 cr. hrs.)

Required Supporting Courses (12 cr. hrs.)
- AFA 343 (4) AFA 440 (4) AFA 484 (4)
- AFA 432 (4) AFA 481 (1-4) AFA 491 (4)

Suggested Elective Courses (24 cr. hrs.)
- AFA 337 (4) AFA 438 (4) AFA 483 (1-4)
- AFA 341 (4) AFA 442 (4) AFA 485 (2-4)
- AFA 428 (4) AFA 443 (4) AFA 499 (4)
- AFA 431 (4) AFA 444 (4)

AGING STUDIES

Undergraduate Program

Although no baccalaureate degree in gerontology is offered, the Aging Studies Program does provide a core of four courses at the undergraduate level. These courses range from AGE 301, Introduction to Gerontology, to AGE 405, Seminar in Selected Topics in Social Gerontology, and are designed as electives for students from a variety of areas, particularly the human service areas. More generally, the objective of the sequence of undergraduate courses is to provide students with a broad educational experience in gerontology.
The Human Services Courses

The HUMAN SERVICES COURSES are designed for students interested in careers in the human sciences and services, and may be taken in conjunction with any major, or by special students. They are closely related to our Urban Community Psychology and Gerontology Program of Distinction and will be taught by qualified faculty from the various disciplines within the college. The Human Services sequence is coordinated by the Aging Studies Program.

Graduate Program

The primary objective of the graduate program in aging is to train personnel for leadership positions in the planning, development, delivery, and evaluation of community services for older persons. In keeping with this objective, the program offers a broad range of cross-disciplinary courses. As an important part of the training process, each graduate student spends a supervised internship for one academic quarter in a community agency or facility which provides services for older persons. A Master of Arts degree in Gerontology is awarded upon satisfactory completion of the requirements.

Requirements for the M.A. Degree in Gerontology:

The M.A. degree requires five quarters of full-time study including one quarter of supervised field experience. Most of the courses required were developed specifically to meet the objectives of the program and are offered under the label "AGE". The M.A. degree in Gerontology requires a minimum of 54 credit hours in approved courses including 12 hours of field placement. Of the 54 hours, 48 hours must be in courses labeled "AGE". Required courses for the M.A. degree include:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE 501 (4)</td>
<td>AGE 603 (4)</td>
</tr>
<tr>
<td>AGE 502 (4)</td>
<td>AGE 606 (4)</td>
</tr>
<tr>
<td>AGE 503 (4)</td>
<td>AGE 610 (4)</td>
</tr>
<tr>
<td>AGE 507 (4)</td>
<td>AGE 690 (2)</td>
</tr>
</tbody>
</table>

Electives from other departments must be approved by the student's adviser. There are no language or thesis requirements.

Admission Requirements

To be eligible for admission to the M.A. program, the applicant must:

1. Hold a baccalaureate degree or its equivalent from an accredited college of university.
2. Have a minimum score of 1000 on the Graduate Record Examination (total of Quantitative and Verbal Aptitude scores) plus a minimum grade point average of 2.5 (A = 4.0) on the last half of courses taken for the bachelor's degree.

or

Have a minimum score of 900 on the Graduate Record Examination (total of Quantitative and Verbal Aptitude scores) plus a minimum grade point average of 3.0 (A = 4.0) on the last half of courses taken for the bachelor's degree.

Preference is given to applicants who demonstrate commitment to or experience in programs for older persons. In addition to the University graduate studies application, a program application is required and should be obtained from the Aging Studies Program.

Because of the sequential nature of the graduate courses, entering students are ordinarily admitted only in the Fall Quarter (September) each year. At that time a new cycle of courses begins and runs for five academic quarters.

ANTHROPOLOGY (ANT/ANL)

Anthropology aims at comprehending man as a biological and social being. It is concerned with all forms of man through time and space. One consequence of this broad-ranging view is the presence within anthropology of four branches: physical anthropology, archaeology, cultural anthropology, and linguistics. Exposure to anthropological information and the cross-cultural perspective produces heightened sensitivity in the student to the world about him. This helps the student to adopt an intellectual posture of disciplined skepticism with respect to any scheme which purports to define and account for regularities in human life.

The primary objective of the graduate program is to provide both basic education and specialized training in several specific fields of applied anthropology which will enable the graduate to render valuable and substantive service at local, state, national and international levels in a context of non-academic, non-teaching employment. Graduates will be capable of assuming vital positions in the various agencies and institutions charged with understanding acting on the complex problems which beset our society.

Because of the sequential nature of the graduate courses, entering students are ordinarily admitted only in the Fall Quarter (September) each year. At that time a new cycle of courses begins.

Requirements for the B.A. Degree in Anthropology (ANT):

The major in Anthropology consists of a minimum of 44 credit hours in the field. Students may take more than this minimum if they desire. ANT 201 is prerequisite to all subsequent courses. ANT 311, 321, 331, and LIN 301 are required as intermediate level training in the main subdivisions of the field and ANT 461 and ANT 491 complete the specific course requirements. Majors may not include more than two each of any of the 400-level courses in the total of the 44 hours required. Anthropology majors are required to take Social Science Statistics (SS 301) or the equivalent, and urged to become competent in the use of a foreign language. Exceptions to course prerequisites require the consent of the instructor.
Required Core Courses (28 cr. hrs.)

ANT 201 (4)  ANT 321 (4)  ANT 491 (4)
LIN 301* (4)  ANT 331 (4)
ANT 311 (4)  ANT 461 (4)

Requirements for the B.A. Degree in Linguistics (ANL):

This sequence is designed for students who are particularly interested in the role of language in human behavior and cultural development.

Required Core Courses (43 cr. hrs. minimum)

ANT 201 (4)  ANT 461 (4)  LIN 301* (4)
ANT 311 (4)  ANT 491 (4)  LIN 401 (4)
ANT 331 (4)  ANT 431 (3-6)
ANT 331 (4)  ANT 401 (3-6)  ANT 411 (3-6)

Required Supporting Courses (12 cr. hrs. minimum from the following group)

LIN 321 (4)  HII 401 (4)  PSY 441 (4)
ANC 373 (2)  HII 402 (4)

Requirements for the M.A. Degree

General requirements for graduate work are listed on page 47 and should be studied carefully.

The student must complete 45 credit hours of graduate course work. All students must complete the four core seminar courses, then proceed to take minimally, one methods course, one selected topics course, and one regional problems course in one of the three tracks (medical anthropology, urban anthropology, public archaeology). In addition, each student must: complete a graduate level statistics course and two graduate-level courses outside the department for a minimum of 6 quarter hours, chosen in mutual agreement by the student and his committee; successfully pass the comprehensive examinations; undertake graduate research; and write a thesis. The student must maintain a "B" average in all course work. In addition, our program requires a "B" average for all four core seminars before the student can proceed to take the comprehensive examinations.

I. COURSES REQUIRED OF ALL STUDENTS
   A. Core Courses
      ANT 601 (3)  ANT 621 (3)  ANT 631 (3)
      ANT 611 (3)
   B. Additional Requirements
      Two graduate-level courses outside the department; one graduate-level statistics course;
      ANT 681 (1-15)  ANT 699 (1-6)
   II. COURSES IN ONE OF THREE TRACKS
      A. Medical Anthropology Track
         ANT 641 (4)  ANT 651 (4)  ANT 661 (4)
      B. Urban Anthropology Track
         ANT 644 (4)  ANT 654 (4)  ANT 664 (4)
      C. Public Archaeology Track
         ANT 647 (4)  ANT 657 (4)  ANT 667 (4)

COMMUNICOLOGY
(AUD/AFU/ARH/ARF/SPP/SPF)

A Master of Science Degree is offered through the Department of Communology that is structured to meet the preparation requirements of the American Speech and Hearing Association for the Certificate of Clinical Competence or the national basic certification requirements of the Council on Education of the Deaf. In addition to the core subject material each student may elect to pursue a program of specialization in the areas of Speech Pathology, Audiology or Aural (Re)Habilitation.

Undergraduate students enroll in a five-year program terminating in the Master of Science degree in Speech Pathology, Audiology or Aural (Re)Habilitation. Students may apply for acceptance in the M.S. degree program upon attaining Junior Class Standing, completion of the CLY 300-level course sequence with a 3.0 grade average, submitting cumulative Graduate Record Examination scores of 850 or greater, and demonstrating competency in communication skills as determined by the Chairperson or his delegate. Students may not apply for a baccalaureate degree. Programs are planned through the master's degree at the time of acceptance.

Applicants holding a baccalaureate degree from an accredited college or university with appropriate prerequisite coursework will be eligible for admission if the following minimal requirements are met:

1. Submission of a cumulative score of 1000 or greater for the GRE aptitude tests plus a grade point average of 3.0 (A=4.0) for the last half of their undergraduate coursework.
2. Submission of three satisfactory letters of recommendation for graduate study, and
3. Demonstration of competency in communication skills as determined by the Chairperson or his delegate.

Requirements for the M.S. Degree in Speech Pathology—Post-Baccalaureate (SPP):

General requirements for graduate work are already delineated by the University’s Division of Graduate Studies. A minimum of 45 credits is required as well as completion of sufficient coursework and practicum to meet the American Speech and Hearing Association’s requirement for clinical certification in speech. The attainment of clinical competency as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communology is also required for graduation. The student with an existing bachelor’s degree and appropriate prerequisites may plan his/her degree program from among the following courses with approval of the Department Chairperson or his delegate:

CLY 311 (6)  CLY 579 (4)  CLY 680 (4)
CLY 513 (6)  CLY 580 (4)  CLY 683 (4)
CLY 571 (6)  CLY 583 (4)  CLY 684 (6)
CLY 572 (6)  CLY 598(1-12)  CLY 685 (6)
CLY 574 (6)  CLY 620 (4)  CLY 698 (1-12)
CLY 575 (4)  CLY 621 (4)  CLY 699 (6)
CLY 576 (4)  CLY 622 (4)  or
CLY 577 (4)  CLY 623 (4)  CLY 681 (6)
CLY 578 (4)  CLY 675 (4)

Requirements for the Combined Undergraduate/Graduate
M.S. degree in Speech Pathology (SPP):

A minimum total of 225 credits is required for the combined undergraduate/graduate M.S. program. In addition to the General Distribution requirements the following courses will be required for all programs:

CLY 301 (6)  CLY 572 (6)  CLY 621 (4)
CLY 302 (6)  CLY 574 (6)  CLY 622 (4)
CLY 311 (6)  CLY 575 (4)  CLY 680 (4)
CLY 312 (6)  CLY 576 (4)  CLY 684 (6)
CLY 313 (6)  CLY 577 (4)  CLY 698 (1-12)
CLY 482 (6)  CLY 578 (4)  CLY 699 (6)
CLY 498(1-12)  CLY 583 (4)  CLY 681 (6)
CLY 511 (6)  CLY 583 (4)  CLY 681 (6)
CLY 513 (6)  CLY 598(1-12)
CLY 571 (6)  CLY 620 (4)

Plus one of the following:
CLY 579 (4)  CLY 675 (4)

*A section of LIN 301 is for anthropology majors and requires ANT 201 as a prerequisite.
In addition, sufficient and appropriate coursework (approved by the Chairperson or his delegate) will be included to meet the preparation requirements of the American Speech and Hearing Association for the Certificate of Clinical Competence. The attainment of clinical competence as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communicology is also required for graduation.

Requirements for the M.S. Degree in Audiology—Post Baccalaureate (AUD):

General requirements for graduate work are already delineated by the University’s Division of Graduate Studies. A minimum of 45 credits is required as well as sufficient coursework and practicum to meet the American Speech and Hearing Association’s requirements for clinical certification in Audiology. The attainment of clinical competence as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communicology is also required for graduation. The student with an existing bachelor’s degree and appropriate prerequisites may plan a program from the following courses with approval of the Department Chairperson or his delegate:

- CLY 512 (6) CLY 580 (4) CLY 680 (4)
- CLY 511 (6) CLY 583 (4) CLY 684 (6)
- CLY 571 (6) CLY 598 (1-12) CLY 685 (6)
- CLY 572 (6) CLY 673 (4) CLY 698 (1-12)
- CLY 573 (6) CLY 674 (4) CLY 699 (6)
- CLY 574 (6) CLY 675 (4) or CLY 575 (4) CLY 676 (4) CLY 681 (6)
- CLY 579 (4) CLY 677 (4)

Requirements for the Combined Undergraduate/Graduate M.S. Degree in Audiology (AUF):

A minimum of 225 credits is required for the combined program. In addition to the General Distribution requirements the following courses will be required for all programs:

- CLY 301 (6) CLY 571 (6) CLY 675 (4)
- CLY 302 (6) CLY 572 (6) CLY 676 (4)
- CLY 311 (6) CLY 573 (6) CLY 677 (4)
- CLY 312 (6) CLY 575 (4) CLY 680 (4)
- CLY 313 (6) CLY 579 (4) CLY 684 (4)
- CLY 482 (6) CLY 580 (4) CLY 698 (1-12)
- CLY 498 (1-12) CLY 583 (4) CLY 699 (6)
- CLY 512 (6) CLY 673 (4) or CLY 513 (6) CLY 674 (4) CLY 681 (6)

Plus one of the following:

- CLY 574 (6) CLY 685 (6)

In addition, sufficient and appropriate coursework (approved by the Department Chairperson or his delegate) must be included to meet the preparation requirements of the American Speech and Hearing Association for the Certificate of Clinical Competence in Audiology. The attainment of clinical competence as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communicology is also required for graduation.

Requirements for the M.S. Degree in Aural (Re)Habilitation—Post Baccalaureate (ARH):

General requirements for graduate are already delineated by the University’s Division of Graduate Studies. A minimum of 45 credits is required as well as sufficient coursework, practicum and internship to meet the Florida State Department of Education certification requirements for specialization with the hearing impaired and to meet the national basic certification requirements of the Council on Education of the Deaf. The attainment of clinical competence as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communicology is also required for graduation. Students may plan programs with emphasis in the areas of preschool, school age, multiply handicapped, and adult hearing impaired. All teachers of the deaf programs will be planned from among courses offered by the appropriate teacher preparation areas within the College of Education as well as from the following:

- CLY 482 (6) CLY 598 (1-12) CLY 685 (6)
- CLY 511 (6) CLY 673 (4) CLY 698 (1-12)
- CLY 572 (6) CLY 675 (4) CLY 699 (6)
- CLY 577 (4) CLY 676 (4) or CLY 580 (4) CLY 680 (4) CLY 681 (6)
- CLY 583 (4) CLY 684 (6)

Requirements for the Combined Undergraduate/Graduate M.S. Degree in Audiology (AUF):

A minimum of 225 credits is required for the combined programs as well as sufficient coursework, practicum and internship to meet the Florida State Department of Education certification requirements for specialization with the hearing impaired and to meet the national basic certification requirements of the Council on Education of the Deaf. The attainment of clinical competence as determined by a minimum GPA of 3.0 in CLY 698 and the approval of a majority of the academic staff of the Department of Communicology is also required for graduation. Students may plan programs with emphasis in the areas of preschool, school age, multiply handicapped, and adult hearing impaired. In addition to the General Distribution requirements all teacher of the deaf programs will be planned to include coursework from the appropriate teacher preparation areas within the College of Education as well as from the following:

- CLY 301 (6) CLY 572 (6) CLY 680 (6)
- CLY 302 (6) CLY 577 (4) CLY 684 (6)
- CLY 311 (6) CLY 579 (4) CLY 685 (4)
- CLY 312 (6) CLY 580 (4) CLY 698 (1-12)
- CLY 313 (6) CLY 583 (4) CLY 699 (6)
- CLY 482 (6) CLY 673 (4) or CLY 513 (6) CLY 675 (4) CLY 681 (6)
- CLY 598 (1-12) CLY 676 (4)

CRIMINAL JUSTICE (CJP)

The major in criminal justice provides students with an indepth exposure to the total criminal justice system including law enforcement, detention, the judiciary, corrections, and probation and parole. The program concentrates on achieving balance in the above aspects of the system from the perspective of the criminal justice professional, the offender, and society.

The objective of the graduate program in criminal justice is to develop a sound educational basis for professional training in one or more of the specialized areas comprising the modern urban Criminal Justice System.

Requirements for the B.A. Degree:

A minimum of 53 quarter hours is required of all undergraduate majors in Criminal Justice including the following courses or their equivalents:

- CJP 300 (5) CJP 302 (4) CJP 491 (3)
- CJP 301 (4) CJP 315 (8) CJP 499 (12)

In addition to the above, a minimum of 17 hours in Criminal Justice selected by the student complete the requirements.

*In-service students are required to take only 4 hours of CJP 499, thus reducing their major course credits to 45 quarter hours.

Any student who receives a grade of "D" or lower in more than one USF CJP course will be automatically barred from continuing as a Criminal Justice major. This applies only to students whose first CJP course is taken during Fall Quarter (I) 1975 or thereafter.
Requirements for the M.A. Degree:

University requirements for graduate study are given on page 47. Additionally, each graduate applicant should submit three letters of recommendation and a letter of intent to the Department of Criminal Justice. Further information may be obtained by contacting the Director of Graduate Studies of the Department of Criminal Justice.

Requirements for graduation for all M.A. candidates will consist of:
1. 45 credits of CJP course work (or approved equivalents) which include:
   - CJP 601 (4) CJP 603 (4) CJP 693 (1)
   - CJP 602 (4)
2. Completion of a thesis; CJP 699.

All course work counted toward the degree must have the prior approval of the student’s major professor and the Director of Graduate Studies of the Criminal Justice program.

■ ECONOMICS (ECN)

Requirements for the B.A. Degree:

Economics is one of the vital disciplines investigating the complex problems and relationships in modern society. Indeed, the theory and practice of economics have made economics a major area within the discipline, including labor economics, international economics, urban and regional economics, monetary economics, public finance, industrial organization, comparative economic systems, and the like. In addition, students are given a sound grounding in complex problems and relationships in modern society. Indeed, concentration area for majors in the other social sciences. The concentration area will be designed for the individual student’s discipline, including labor economics, international economics, urban and regional economics, monetary economics, public finance, industrial organization, comparative economic systems, and the like. In addition, students are given a sound grounding in complex problems and relationships in modern society.

A student may earn a Bachelor of Arts degree with a major in Economics by completing satisfactorily 48 credits in Economics in addition to College requirements. Normally, these 48 credits include:

- ECN 201 (4) ECN 323 (5) ECN 331 (5)
- ECN 202 (4) ECN 231 (3) ECN 405 (4)
- ECN 301 (4)

In addition to this core, students are encouraged to select 300-level courses in several of the applied areas during their junior year. The remaining economics electives may be selected from those 300 and 400 level courses that provide the type of program that best suit the students’ interests and objectives.

Students majoring in economics are encouraged to supplement their programs with appropriate courses in other social sciences. Political science, psychology, sociology and others contribute greatly to an enriched plan of study. Similarly, a variety of courses in economics are designed to permit students majoring in other disciplines to acquire the skills and insights provided in economics. The Department of Economics offers a concentration area for majors in the other social sciences. The concentration area will be designed for the individual student’s program. Thus students have the option of broad interdisciplinary programs, a general grounding in many areas of economics, or a more intensive concentration in one of the areas within economics.

Students interested in majoring in economics or having a concentration area are encouraged to contact the departmental adviser for more information about the program. In addition, the department maintains a file describing the varied career opportunities for economists in business, government, and education.

■ GEOGRAPHY (GPY)

Requirements for the B.A. Degree:

Geography as a discipline is designed to account for the variable character of the earth’s surface. The two major divisions of geography are physical and cultural (human). Physical geography includes the study of earth-sun relationships, weather, climate, and natural features of the landscape such as landforms, soils, vegetation, and hydrology. Cultural geography studies people, their various cultures, levels of technology, and economic activities which operate differentially to alter the natural landscape.

Geography’s overriding purpose is to understand the earth as the home of man. A major concern of geography is the wise use of natural, human, and economic resources. Therefore, ecological and environmental considerations are central to the study of geography.

Students are encouraged to take elective credits in a wide variety of disciplines because of the cross-disciplinary approach of geography. Both social and natural sciences are recommended.

Geography majors generally teach or work in various planning, resource management, or consulting agencies, both private and governmental at all levels—local, state, and federal.

A major in geography consists of 50 credit hours as follows:
- Required core courses (40 cr. hrs.)
  - GPY 301 (5) GPY 371 (5) GPY 407 (5)
  - GPY 302 (5) GPY 403 (5) GPY 409 (5)
  - GPY 303 (5) GPY 405 (5)
- Electives in geography (10 cr. hrs.)

Any 10 hours in GPY 400-or 500-level courses.

Requirements for the M.A. Degree:

General requirements for graduate work are given on page 47.

All students must complete 45 credit hours in graduate geography courses, following one of the two plans outlined below. A written and oral comprehensive examination covering the general field of geography is required before graduation, and the student must demonstrate his ability to translate into English the pertinent scientific literature from one modern foreign language. Foreign students, whose mother tongue is not English, may use English as their foreign language. A computer language (such as Fortran) may be used to meet the language requirement.

Thesis Program: The 45 credit hours in geography must include: GPY 501, 503, 507, 603, 605, 607, and 699. Up to eight credits outside the department may be elected with the approval of the student’s committee and major professor. An oral defense of the thesis is required.

Non-Thesis Program: The 45 credit hours in geography must include: GPY 501, 503, 507, 601, 603, 605, 607, and 689. Up to four credits outside the department may be elected with the approval of the student’s committee and major professor.

■ HISTORY (HTY)

Requirements for the B.A. Degree:

A minimum of 48 quarter hours is required for a major in history, 16 hours of 200-level courses, or their equivalent, constitute the lower level requirements. HTY 487, 491, and 492 constitute the upper level requirements for the degree. At least 20 hours of course work must be drawn from the 300-400 level. With the prior written consent of the student’s adviser, majors may take up to eight (8) hours of course work offered by other departments and apply these hours toward meeting the course requirements in history. The course work undertaken outside the Department of History must complement the student’s program in history.

It is recommended that history majors take ENG 350, "Advanced Expository Writing," SPE 201, "Fundamentals of Speech Communication," LLI 200, "Use of the Library," and 27 quarter hours drawn from the following disciplines: Afro-American Studies, Anthropology, Economics, Geography,
Political Science, Interdisciplinary Social Sciences, Psychology, Philosophy, Sociology, Literature, the Humanities, and the Fine Arts. Majors intending to pursue graduate work should take a minimum of two years of classical or modern foreign language.

**Requirements for the M.A. Degree:**

The graduate curriculum in history is composed of a core program, a thesis, and course work in the following fields: Field I, American history to 1877; Field II, American history since 1877; Field III, Early Modern European history; Field IV, Modern European history; Field V, Ancient and Medieval history; Field VI, Latin American history.

In addition to the general requirements of the University, a candidate is required to complete a total of 48 credit hours divided as follows: 8 hours of core courses; 16 hours in a major field; 8 hours in a minor field; 8 hours of thesis, and 8 hours of electives. Of the 48 hours, at least 30 must be in formal, regularly scheduled course work, 24 of which must be at the 600 level. Subject to the satisfaction of above requirements, courses at the 500 level are acceptable as part of a planned degree program and in special circumstances major advisers may approve up to 8 hours at the 400 level with the definite understanding that additional and superior work will be required of the graduate student. The core courses, HTY 600, 601 are required of all candidates.

A reading proficiency in one foreign language must be demonstrated. A satisfactory preparation in the core program, two fields, the completion of a comprehensive examination, and a thesis are required for graduation.

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**INTERDISCIPLINARY SOCIAL SCIENCES (SSI/INT)**

The Department of Interdisciplinary Social Sciences administers the College major and the major in International Studies; it offers non-degree programs in Leisure Studies and in Women’s Studies; it administers the Off-Campus Term Program.

**The College Major (SSI): Requirements for the B.A. Degree:**

The college major offers students whose educational and vocational interests and objectives cross disciplinary lines an opportunity to undertake a program of study individually designed to serve those interests and objectives. That program of study must include 64 credits in courses offered in the college of which 12 must be taken in courses bearing the SSI prefix (Interdisciplinary Social Sciences) and one of these must be SSI 301, Social Science Statistics.

Within these parameters each student’s program of study is to be evolved in consultation with and must be formally approved by the major adviser. The program of study must include an area of concentration of at least 20 credits in one discipline; it will normally be expected to include a second area of concentration with either a disciplinary or multidisciplinary focus. The choice of areas of concentration and of courses within them is to be directly related to the educational goals of the student and such as to provide an educational experience of excellent quality.

**International Studies (INT): Requirements for the B.A. Degree:**

The major in International Studies is designed to enable students to undertake programs of study based upon the course offerings of at least three departments of the college, which will emphasize (a) preparation for careers in international activities, or (b) the study of particular international themes or topics, or (c) the study of particular regions or cultures.

The program of study is developed by each student in consultation with the major adviser so as best to serve the individual’s educational goals. The program is to include not less than 48 credits. Of these 24 (6 courses) must be in the international studies offerings of the Department of Interdisciplinary Social Sciences, bearing the prefix SSI.

**Required Core Courses (24 cr. hrs.)**

SSI 300 (4)  SSI 449 (4)  SSI 491 (4)

SSI 361 (4)

**One of the following:**

SSI 339 (4)  SSI 343 (4)  SSI 347 (4)

SSI 341 (4)  SSI 345 (4)

**One of the following with international content:**

SSI 383 (2.5)  SSI 481 (1-4)  SSI 485 (1-4)

The additional 24 credits (6 courses) required must be selected from course offerings of at least two other departments which have international, regional, or cultural content.

**Required Supporting Courses**

18 cr. hrs. (or equivalent proficiency) of appropriate foreign language.

Students will be provided with advice as to choices of other courses offered throughout the University which will best reinforce and complement their major program. Each student’s program must be planned with the international studies adviser who is empowered to make appropriate substitutions when educationally justified. Up to nine credits may be substituted for these requirements by successfully passing SSI 395 (1-9).

**Leisure Studies Program**

The Leisure Studies Program is perhaps the only university agency in America devoted entirely to the subject of leisure in the broadest sense: a concern with the total pattern of work and nonwork trends of the post-industrial society related to cybernation, increases in bulk time, flexible work patterns, urbanization, changing values, public policy, expenditures for recreation, and new demands on education and other social institutions. This is done through conferences, consultations, field research, lectures, writings and newsletters, workshops and seminars. Its quarterly Newsletter is widely distributed: Technology, Human Values and Leisure (Abingdon Press, 1971) results from one of its conferences. The USF Program represents the United States in a research team including France, West Germany, Canada, Sweden, Switzerland, Poland,
Bulgaria, and Czechoslovakia. Students in the introductory and advanced seminars participate in field studies, such as family interviews, questionnaire surveys, and observations of activities.

Courses staffed by Leisure Studies and offered through the Interdisciplinary Social Science Department:
- SSI 413 Leisure in Society
- SSI 421 Sport in Society
- SSI 522 Leisure Theory
- SSI 523 Leisure Planning: Community and State
- SSI 525 Leisure Policy

Off-Campus Term
The Off-Campus Term Program, described more in detail elsewhere in this Bulletin, is a university-wide, interdisciplinary program which urges students to spend part of their time in college in pursuits that are self-designed and implemented in an environment entirely off-campus and out of the classroom. OCT provides an “education in life” for full academic credit as an alternative to the traditional methods of learning.

Women’s Studies Program
The Women’s Studies Program offers a concentration of interdisciplinary courses focusing on the role of women in the modern world. Several of its courses are cross-listed with those of other departments, such as Anthropology and Psychology.

POLITICAL SCIENCE (POL)

Requirements for the B.A. Degree
The undergraduate program leading to the B.A. in political science offers a general purpose degree, and a number of more specialized alternatives. These include the pre-professional plan in political science, the pre-law plan in political science and honors in political science. The program is designed for students interested in and seeking to understand political problems and issues, the nature of the political process, as well as the philosophical and legal bases of political structures and processes at local, state, and national levels within the United States and elsewhere. Satisfying the degree requirements prepares students for positions in the public and private sectors, for law school, for graduate work in political science and related disciplines, for positions in education, and for applied political activity.

A minimum of 48 credit hours is required to satisfy the requirements of the major. Students must take the eight credit hours which make up the core curriculum, and a total of 10 courses (40 credit hours) in political science, of which at least four courses must be above the 300 level. For instructional purposes, the political science curriculum is divided into seven fields. However, there are no field requirements. Students are free to select courses from any and all fields within the curriculum.

The undergraduate curriculum in political science is composed of the following:

<table>
<thead>
<tr>
<th>Required Core Courses (8 cr. hrs.)</th>
<th>Field I Political Theory</th>
<th>Field II Comparative Government and Politics</th>
<th>Field III International Relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>POL 200 (4)</td>
<td>POL 310 (4)</td>
<td>POL 320 (4)</td>
<td>POL 330 (4)</td>
</tr>
<tr>
<td>POL 315 (4)</td>
<td>POL 412 (4)</td>
<td>POL 427 (4)</td>
<td>POL 432 (4)</td>
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<td></td>
<td>POL 510 (4)</td>
<td>POL 520 (4)</td>
<td>POL 433 (4)</td>
</tr>
<tr>
<td>Electives from the seven fields (40 cr. hrs.)</td>
<td>Field I Political Theory</td>
<td>Field II Comparative Government and Politics</td>
<td>Field III International Relations</td>
</tr>
<tr>
<td></td>
<td>POL 411 (4)</td>
<td>POL 413 (4)</td>
<td>POL 331 (4)</td>
</tr>
<tr>
<td></td>
<td>POL 414 (4)</td>
<td>POL 515 (4)</td>
<td></td>
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<tr>
<td></td>
<td>POL 516 (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field IV American National and State Governments
- POL 200 (4)                          
- POL 201 (4)                          
- POL 341 (4)                          
- POL 342 (4)                          
- POL 343 (4)                          
- POL 346 (4)                          
- POL 447 (4)                          
- POL 448 (4)                          

Field V Urban Government and Politics
- POL 350 (4)                          
- POL 352 (4)                          
- POL 451 (4)                          
- POL 453 (4)                          
- POL 454 (4)                          
- POL 455 (4)                          
- POL 550 (4)                          
- POL 551 (4)                          

Field VI Public Administration
- POL 360 (4)                          
- POL 466 (4)                          
- POL 467 (4)                          
- POL 468 (4)                          
- POL 560 (4)                          
- POL 561 (4)                          
- POL 562 (4)                          
- POL 563 (4)                          
- POL 564 (4)                          

Field VII Law and Politics
- POL 370 (4)                          
- POL 371 (4)                          
- POL 373 (4)                          
- POL 374 (4)                          
- POL 471 (4)                          
- POL 472 (4)                          
- POL 473 (4)                          
- POL 474 (4)                          
- POL 475 (4)                          
- POL 476 (4)                          
- POL 477 (4)                          
- POL 478 (4)                          
- POL 479 (4)                          
- POL 481 (4)                          
- POL 482 (4)                          

Pre-professional Plan in Political Science
This plan is designed for students seeking an intensive undergraduate concentration in political science. Typically, students electing this plan will be oriented towards graduate work in political science or other social sciences. A minimum of 52 credit hours is required.

Students must take eight credit hours of required courses:
- POL 200 (4)                          
- POL 315 (4)                          

Eleven additional courses in political science (44 cr. hrs.) must be taken, of which at least seven must be above the 300 level. Concentration within fields will be encouraged.

Honors in Political Science
Honors in political science is designed for the outstanding undergraduate who seeks an intensive program plus academic recognition during the senior year. Admission to the honors sequence, which is available to all undergraduate majors, will be controlled by grade point average, personal interviews and close scrutiny of the student’s program and record. Students admitted will participate in an honors seminar, POL 491 (4) and will write an honors thesis, POL 492 (4).

Field Work
The Department of Political Science has a field work program which provides students with part-time internships with local government in the Tampa Bay area and with political parties at the state and local level. Academic credit is available for such internships. For further information, contact the Department of Political Science.

Requirements for the Pre-Law Plan in Political Science
The Department of Political Science offers a pre-law plan designed for the undergraduate considering a career related to law: Field VII of the undergraduate curriculum (Law and Politics). The courses making up the Field are of particular interest to law-oriented students, but may be taken by others as well. The Department seeks to guide majors to those courses which develop skills and provide information needed for good performance in the study of law. The department also seeks to give students the skills and information needed for entry into a number of law-related positions in business and government. An integral part of this plan is a high degree of student access to the Department’s pre-law adviser.
Prior to admission to a law school, a student must take the Law School Admission Test (LSAT). This test is given by the Educational Testing Service of Princeton, New Jersey.

The Law School Admission Test is given simultaneously several times each year at the University of South Florida and numerous other testing centers throughout the state. Students should plan to take the test no later than February of the year in which they make application to a law school. Information pamphlets and application forms for the test are obtainable from the Department of Political Science, University of South Florida.

(Pre-law is not a prescribed program of study. No specific college major is required for admission to law school. Those students intending to pursue the study of law must obtain a Bachelor of Arts degree in an area of personal choice. It is generally agreed that a good lawyer must have knowledge and understanding of the political, economic, and social context within which legal problems arise.)

Requirements for the M.A. Degree

The graduate program leading to the M.A. in political science is designed to offer advanced general instruction in political science and public administration on national, state, and local levels of government. It prepares its graduates for positions of responsibility in the public and private sectors as well as in research, teaching, and study at the doctoral level.

General requirements for graduate work are given on page 47.

The student must complete a minimum of 45 credit hours of graduate level courses, of which at least 24 hours must be at the 600 level. A minimum of 30 credit hours must be taken in formal, regularly scheduled classes. Courses at the 500 level are accepted for credit towards the degree when taken as part of a planned program, with the approval of the student’s adviser and the Department of Political Science.

A minimum of 28 credit hours must be taken in political science; eight credit hours of approved electives may be taken outside the department. All graduate students must write a thesis (nine credit hours) or petition for substitution with 12 credit hours of regular courses.

All students must pass a comprehensive examination in order to satisfy the degree requirements. This examination normally will be given following the completion of the thesis. Students whose petitions for the non-thesis option have been approved will be permitted to take the examination upon successful completion of at least 40 credit hours.

Students who do not have an undergraduate major in political science, or its equivalent, may be admitted to the program upon the consent of the department. Such students may be asked to take additional courses beyond the minimum requirements. Students must be registered as full-time graduate students for at least one quarter of study.

All graduate students are required to take the graduate core curriculum:

POL 610 (4)
POL 515 or POL 516 (4)

For instructional purposes, the graduate curriculum in political science has been divided into seven fields:

Field I Political Theory
POL 510 (4) POL 610 (4) POL 616 (4)
POL 515 (4) POL 614 (4)
POL 516 (4) POL 615 (4)

Field II Comparative Government and Politics
POL 520 (4) POL 626 (4) POL 627 (4)
POL 620 (4)

Field III International Relations
POL 630 (4) POL 631 (4)

Field IV American National and State Governments
POL 540 (4) POL 641 (4) POL 647 (4)
POL 640 (4) POL 646 (4) POL 648 (4)

Field V Urban Government and Politics
POL 550 (4) POL 650 (4) POL 652 (4)
POL 551 (4) POL 651 (4) POL 653 (4)

Field VI Public Administration
POL 560 (4) POL 564 (4) POL 667 (4)
POL 561 (4) POL 660 (4) POL 668 (4)
POL 562 (4) POL 661 (4)
POL 563 (4) POL 666 (4)

Field VII Law and Politics
POL 571 (4) POL 670 (4) POL 671 (4)
POL 574 (4)

The following non-field courses may be used as elective hours:

POL 681 (1-8) POL 685 (4) POL 699 (9)
POL 683 (4)

Plans of Study

Students may select one of two course plans:

Plan I: General Degree Plan
a) 2 core courses (POL 610 and either POL 515 or POL 516)

b) 3 courses in one or two major fields

c) 2 courses may be elected outside the department

d) other courses to be specified on an individual basis from any field within the graduate curriculum

Plan II: Public Administration and Urban Affairs Plan
a) 2 core courses (POL 610 and either POL 515 or POL 516)

b) POL 660

c) 5 courses in public administration and/or urban affairs

d) 2 courses may be elected outside the department

e) other courses to be specified on an individual basis from any field within the graduate curriculum

More detailed instructions may be obtained from the Department of Political Science.

■ PSYCHOLOGY (PSY)

The undergraduate program in Psychology offers the student a well-rounded Liberal Arts education, together with the opportunity to gain a special acquaintance with issues such as those concerning man’s role in modern society, tactics of social change, personal adjustment, and educational goals and strategies. In addition, the program provides excellent background training for qualified students who wish to pursue graduate work in disciplines such as clinical, experimental, or industrial psychology, education, aging studies, counseling, women's studies, black studies, or community relations.

The faculty of the Psychology Department is divided into three broad program areas: Clinical-Community, Experimental-Physiological, and Industrial-Organizational. Each of these program areas offers M.A. and Ph.D. level training as well as instruction at the undergraduate level. Members of the Clinical-Community faculty offer coursework and training in the areas of abnormal psychology, developmental psychology, behavior modification, psychotherapy, personality, and psychological assessment. Individual research experience is also available to qualified students. Members of the Experimental-Physiological faculty provide coursework and, for qualified students, direct and extensive research experience, in the areas of comparative psychology, electrophysiology, learning and conditioning, human memory, perception, and information processing. Members of the Industrial-Organizational faculty offer coursework and special training in areas including selection, training and evaluation of employees, job motivation and satisfaction, small group analysis, organizational theory, and human factors.

Requirements for the B.A. Degree:

 Majors must complete at least 45 credit hours in the field. All majors must complete:
and select four courses as follows:

- PSY 402 or PSY 441 (4)
- PSY 405 or PSY 445 (4)
- PSY 403 or PSY 404 (4)
- PSY 452 or PSY 455 (4)

In addition, 12 elective credits in psychology courses must be completed. PSY 411 (4) is strongly recommended for all majors and required of students planning graduate training. Functional mathematics and biological science are recommended. Otherwise, students majoring in psychology are encouraged to complete a varied undergraduate program.

Admission to Graduate Study:

Applications for admission to the M.A. or Ph.D. degree program are considered only once per year, for admission into the program in September of that year. The deadline for completed applications is March 1. A completed application includes a transcript of college work, a copy of scores on the GRE Aptitude Test, and three letters of recommendation (preferably from college instructors). Admission to the program is on a competitive basis. Details concerning the program, including a description of the credentials needed to be competitive with other applicants, are available from the Chairman, Graduate Admissions Committee, Department of Psychology, USF, Tampa, Florida 33620.

Requirements for the M.A. Degree:

The student must complete 50 credit hours of graduate psychology courses. All students must take at least two of the three methods courses, each of which must have a different topic, listed under PSY 631. In addition, the student must complete a minimum of five of the following ten courses:

- PSY 609 (5)
- PSY 612 (5)
- PSY 614 (5)
- PSY 634 (5)
- PSY 635 (5)
- PSY 636 (5)
- PSY 641 (5)
- PSY 642 (5)
- PSY 643 (5)
- PSY 639 (5)

The selection of these courses will be made by mutual agreement of the student and his advisory committee. Students with prior work in these areas may waive any of these courses by successfully passing a special examination given by the Psychology Department. Successful waiver may be used to reduce the overall credit hours requirement, if approved by the Psychology Department. A research thesis, PSY 699, is required and the student must successfully pass an oral examination of the thesis as well as maintain a B average in course work, exclusive of thesis and research courses.

In addition to the M.A. degree in psychology, the Psychology Department in the Department of Educational Psychology in the College of Education jointly grant the M.A. degree in School Psychology (PSE). (See College of Education, page 79.)

Requirements for the Ph.D. Degree:

The Ph.D. in Psychology is offered in the fields of Clinical, General Experimental, and Industrial-Organizational Psychology. Specific requirements are determined by the student and his supervisory committee.

Assuming that the student has completed an M.A. degree in Psychology or its equivalent, the Psychology Department requires the following in addition to the general University requirements for the Ph.D. degree, on page 48:

1. Reading knowledge of two foreign languages, or substitution for either or both languages by demonstrated competency in an area or areas approved by the Psychology Department. Two substitutive areas currently approved are computer usage skills and electronics skills.
2. Supervised undergraduate psychology teaching experience.
3. A one-year internship in an approved clinical facility for Ph.D. students in the Clinical Psychology program.
4. Six months of internship in approved industries or community agencies as available for Ph.D. students in the Industrial-Organizational Psychology program.

REHABILITATION COUNSELING (REH/REF)

Requirements for the M.A. Degree:

General requirements for graduate work are given on page 47.
The M.A. program in Rehabilitation Counseling requires a minimum of 60 credit hours and offers the student the flexibility of entering while he is a University senior (REF) or after he has earned a baccalaureate degree (REH).

Minimum admission requirements for students electing the five-year approach include completion of 135 quarter hours, a score of at least 1000 on the GRE or a B average on all work beyond 90 credit hours, and a personal interview. He/she must complete all General Distribution requirements and may not apply for a baccalaureate degree.

Minimum admission requirements for students entering the program as regular graduate students after they have earned a baccalaureate degree include a score of at least 1000 on the GRE or a B average during the last two years of college work, and a personal interview.

The GRE must be taken by all students entering the program whether or not they meet the B average requirement.

Requirements for graduation for all students include a minimum of 60 credit hours in the post-baccalaureate program and a total of no less than 225 for those in the five-year program. The following 50 hour core courses are consistent with national certification standards for rehabilitation counselors and must be taken by all students:

- REH 501 (5) REH 508 (2) REH 610 (4)
- REH 502 (5) REH 602 (5) REH 611 (2)
- REH 503 (5) REH 606 (3) REH 620 (10)
- REH 507 (4) REH 608 (5)

Additional hours to complete either the minimum of 60 credit hours or the minimum of 225 credit hours may be elected from other REH offerings or from related graduate programs, with the consent of the student's adviser. There are no language or thesis requirements; however, a comprehensive examination is required involving both written and practical work.

### SOCIOLOGY (SOC)

As an undergraduate major, sociology provides students with three different kinds of program concentrations. One, attractive to the majority of possible students, may be described as "useful sociology." Many of the courses taken involve skills valuable in employment. For example, in a research methods course, interviewing skills can be used in sales, personnel work, social action careers, management, as well as in research. Similarly, careers which involve inter-personal relations can benefit enormously from courses in social psychology or small group analysis. Also, pre-professional training, as in law school, business administration, social work, and the like, can rest on courses that have "useful" aspects in them. Another concentration can be styled that of "liberal education." In this concentration, the central point is the question of the nature of man, the social being. Experience has shown that the truly liberally educated person is prepared for a variety of life experiences because that person understands how to ask important questions and how to go about getting answers. More importantly, the liberally educated person is equipped to take seriously the matter of being a human being. Sociology courses are aimed largely at problems on the nature of one's social world, the nature of man collectively, and on the individual person—the student as a unique being. Finally, sociology can be a major in the sense that it represents an intellectual discipline. Some students will find that it is interesting in its own right and that they would like to continue educational pursuits beyond the bachelor's degree.

These different concentrations differ as much in the attitude of the student taking the courses as in the selection of courses making up the individual program of study. They are not logically distinct concentrations: any one course may have elements of all three. For example, a student majoring in sociology as an academic discipline may at the same time involve himself in questions of a liberal education and at the same time pick up skills which will lead to satisfying employment. Students should understand that sociology majors are not restricted to social work or even social action types of careers. Any career involving human interaction, and that covers an extremely wide range of careers, actually benefits from sociological training.

### Requirements for the B.A. Degree:

The major consists of a minimum of 40 credit hours. The following courses may not be counted in the 40-hour minimum for the major but may be elected as additional courses: SOC 181, 251, 326, 401, 481. A model program of recommended sequences may be obtained from the Department of Sociology.

Transfer students should be aware that by University regulations, the equivalent of one academic year must be taken in "on-campus" courses. In Sociology, we require that of the 40 credits needed to make up the major, no more than 10 credits earned elsewhere can count towards the major, and in addition, the 10 credits offered for the major must reflect courses offered here. The purpose of this rule is to insure that our certification that an individual has majored in sociology genuinely reflects our understanding of sociology as a major and that there is no fundamental difference between the transfer student and those whose work was entirely or mostly completed at the University of South Florida.

#### Required Core Courses (16 cr. hrs.)

- SOC 201 (4)
- SOC 321 (4)
- SSI 301 (4)
- SOC 315 (4)

#### Additional Requirements (8 cr. hrs.)

One course of:

- SOC 331 (4)
- SOC 433 (4)
- SOC 535 (4)

One course of:

- SOC 341 (4)
- SOC 345 (4)
- SOC 443 (4)

### Requirements for the M.A. Degree:

A minimum of 45 credit hours and a thesis.

#### Required Courses (23 cr. hrs.)

- SOC 611 (4)
- SOC 623 (5)
- SOC 699 (8)

#### University requirements for graduate study are listed on page 47.

Admission to the M.A. Program: Satisfactory score on the Graduate Record Examination (Aptitude); two letters of reference from previous instructors; four courses in sociology, including statistics, theory, and methods of research (SSI 301, SOC 315, and SOC 321 or equivalent). Documents are sent to the Office of Admissions. Instructions for applicants are available from the Department of Sociology.

### SOCIAL WORK (SOK)

The Department of Sociology is now offering a program leading to a Bachelor of Social Work degree. This program is designed along guidelines and recommendations of the Council on Social Work Education and the National Association of Social Workers, which are the accrediting body and the professional organization for social workers. The curriculum includes some courses previously and currently offered in the College of Social and Behavioral Sciences, plus supervised field work experience. Enrollment is limited to insure a quality program.

The baccalaureate degree in social work enables students to develop entry level competence for beginning professional social work practice. It prepares students for employment as generalists in social service agencies and organizations. It also provides a firm foundation for graduate study in social work and other human service professions. In addition, it educates students for more effective citizenship roles through a broad understanding of social service and welfare programs in their communities.

As a program for entry into the profession of social work, the program is designed to satisfy a diverse set of expectations. Any such training program must meet obligations to the clients to be served, to the profession itself, to the university community
of which it is a part, to the student who is undergoing the training, and to the general public for whom the profession, social service agencies, and the university exist. The sociology department reserves the right to refuse enrollment or the continuation of enrollment to any student who, in the judgment of the faculty, has physical, mental, or personality handicaps which would be detrimental to the welfare of the clients whom the student would serve.

Unlike other academic programs, the B.S.W. program cannot be entered simply by declaring a major. There are certain prerequisites which will be detailed below. After taking certain courses in social work, a student must formally apply and submit required information. This application will be reviewed by a committee which may require an in-person interview in special cases.

Largely because of limited state funds available for higher education, and to avoid needless duplication of effort in such training programs, access to the program will sometimes be denied on the grounds that there is no room for additional students however qualified they may be. This is an unfortunate circumstance, and can vary according to the pattern of tax collection by the state as it impacts on the budget of the university. Accordingly, each student in making application, must understand that in addition to academic restrictions, there may be budget restrictions imposed after an academic year is underway and over which neither the department nor the university itself has real control.

Prerequisites for Admission to Program

1. A student must be admitted to the University of South Florida and have met all distribution requirements for the bachelor's degree, or hold an AA degree with an overall GPR of 2.5 or better. The student must declare a major and file a statement of intention to apply for the B.S.W. degree.

2. The student must complete six (6) of the following courses (equivalent to 24 credits) or equivalent (some of which may count toward distribution requirements):
   - ANT 371 (4)
   - HTY 308 (4)
   - PSY 200 (5)
   - ECN 201 (4)
   - POL 200 (4)
   - SOC 181 (4)
   - ECN 202 (4)
   - POL 201 (4)

3. Successfully complete SOC 201, 301, SOK 411 or 412, and one of the Human Service courses (carrying an HUS identification) with a minimum grade of B in each.

4. Have at least one paid or volunteer experience of six (6) weeks or longer in a social service setting.

5. Submit a formal application for admission to the program together with at least three (3) letters of recommendation attesting to character, ability, and skills generically required of good professional conduct.

6. An overall GPA of 3.0 or better at time of application.

Requirements for the B.S.W. degree

1. Social Welfare Policy and Service
   - SOC 301 (4)

2. Social Work Practice Courses
   - HUS 426 (4)
   - SOK 411 (4)
   - SOK 412 (4)

3. Human Behavior and Social Environment
   - HUS 427 (5)
   - SOC 331 (4)

4. Social Research
   - SOC 321 (4)
   - SSI 301 (4)

5. Directed Field Experience
   - SOK 440 (12-15)

Summary:
- Prerequisites (some counting toward distribution requirements): 28 credits
- Social Work Sequence Courses: 33 credits
- Field Placement: 12-15 credits
- Total Credits: 73-76 credits
Courses offered for credit by the University of South Florida are listed on the following pages in alphabetical order according to subject area.

The first line of each description includes the prefix and course number, title, and number of credits. Credits separated by a colon indicate concurrent lecture and laboratory courses taught as a unit:

PHY 201-202. GENERAL PHYSICS (4:1)

The following abbreviations are utilized in various course descriptions:

- GR See S/U Grades in the Graduate Program heading in the Division of Graduate Studies
- PR Prerequisite
- CI With the consent of the instructor
- CC With the consent of the chairperson of the department or program
- CR Corequisite
- Lec.-lab. Lecture and laboratory
- Lec.-dem. Lecture and demonstration
- Lec.-pro. Lecture and problem

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

Accounting (ACC)
Afro-American Studies (AFA)
Aging Studies (Gerontology) (AGE)
American Studies (AMS)
Ancient Studies (Religious Studies) (ANC)
Anthropology (ANT)
Art (ART)
Astronomy (AST)
Biology (BIO)
Botany (BOT)
Microbiology (MIC)
Zoology (ZOO)
Chemistry (CHM)
Communicology (CLY)
Cooperative Education (COE)
Criminal Justice (CJP)
Dance (DAN)
Developmental Mathematics (DMA)
Economics (ECN)
Education:
- Art Education (EDA)
- Curriculum (EDC)
- Elementary Education (EDE)
- English Education (EDT)
- Exceptional Child Education (EDS)
- Foreign Language Education (EDX)
- Foundations (EDF)
- Guidance (EDG)
- Health Education (HEN)
- Humanities Education (EDY)
- Junior College Education (EDH)
- Library-Audiovisual Education (EDL)
- Music Education (EDM)
- Natural Science-Mathematics Education (EDN)
- Physical Education for Teachers (EDP)

Measurement-Research-Evaluation (EDQ)
Reading Education (EDR)
Social Science Education (EDW)
Speech Communication-English Education (EDT)
Vocational and Adult Education (EDV)

Engineering:
- Basic Engineering (EGB)
- Electrical and Electronic Systems (ESE)
- Energy Conversion and Mechanical Design (EGR)
- Industrial Systems (EGS)
- Structures, Materials, & Fluids (EGX)
- Computer Service Courses (ESC)
- Engineering Technology (ETK)

English (ENG)
Environment (ENV)
Finance (FIN)
Fine Arts (Interdisciplinary) (FNA)
Foreign Languages:
- General Foreign Languages (FOL)
- Arabic (ARA)
- Classics (CLS)
- French (FRE)
- German (GER)
- Greek (GRE)
- Hebrew (HEB)
- Italian (ITA)
- Latin (LAT)
- Portuguese (POR)
- Romance (ROM)
- Russian (RUS)
- Spanish (SPA)
- General Business Administration (GBA)
- Geography (GPY)

Geology (GLY)
History (HTY)
History of Ideas (HII)
Human Services (HUS)
Humanities (HUM)
Interdisciplinary Language-Literature (ILL)
Linguistics (LIN)
Management (MAN)
Marine Science (MSC)
Marketing (MKT)
Mass Communications (COM)
Mathematics (MTH)
Medical Sciences (MSG)
Medical Technology (MET)
Medicine (MED)
Military Science (MIS)
Music (MUS)
Natural Sciences (NAS)
Nursing (NUR)
Off-Campus Term (OCT)
Philosophy (PHI)
Physical Education, Elective (PEB)
Physical Sciences (PHS)
Physics (PHY)
Political Science (POL)
Psychology (PSY)
Rehabilitation Counseling (REH)
Religious Studies (REL)
Ancient Studies (ANC)
Senior Seminar (CBS)
Social Sciences, Interdisciplinary (SSI)
Social Work (SOK)
Sociology (SOC)
Speech Communication (SPE)
Theatre (TAR)
Women's Studies (WSP)

Cross-Listing of Departments and Programs Alphabetically by Prefix

<table>
<thead>
<tr>
<th>Department Prefix</th>
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<td>ACC</td>
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<td>BOT Botany</td>
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<td>CBS Senior</td>
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ACCOUNTING (ACC)


LOWER LEVEL COURSES

ACC 201. ELEMENTARY ACCOUNTING I (3)
Study of basic accounting principles including the recording and reporting of financial activity. The preparation and interpretation of financial statements.

ACC 202. ELEMENTARY ACCOUNTING II (3)
PR: ACC 201. Accounting theory and practices for various equity structures.

UPPER LEVEL COURSES

ACC 300. ACCOUNTING FOR MANAGEMENT CONTROL (3)
PR: ACC 202. Study of accounting from user's point of view. Includes measurement theory, use of financial statements, and accounting measurement in planning and control.

ACC 301. INTERMEDIATE ACCOUNTING I (4)
PR: ACC 300 or concurrent registration in ACC 300. Measurement theory and methodology underlying income measurement and reporting of financial position. The study of cash, time value analysis, receivables, and inventories.

ACC 302. INTERMEDIATE ACCOUNTING II (4)
PR: ACC 301. Continuation of theory and principles underlying financial statements, current and long term liabilities, plant and equipment, investments, intangible, leases and pensions, and owners' equity.

ACC 303. INTERMEDIATE ACCOUNTING III (3)
PR: ACC 302. Required for Accounting majors. Continuation of theory and principles underlying financial statements, earnings per share, income tax allocation, price-level changes, accounting changes, statements from incomplete records, statements of change in financial position and contemporary accounting issues.

ACC 401. ADVANCED ACCOUNTING (3)
PR: ACC 302; MTH 211 or College Algebra. Quantitative application in accounting, partnerships, governmental accounting and price-level changes.

ACC 402. CONSOLIDATED FINANCIAL STATEMENTS (3)
PR: ACC 302. Accounting for home office and branch operations and business combinations.
ACC 405. ACCOUNTING INFORMATION SYSTEMS (4)
PR: ACC 302, GBA 333. General systems theory, total systems concept, internal control problems, and computer based accounting systems.

ACC 411. FEDERAL TAXES (4)
PR: ACC 202. An introduction to the federal income tax structure. Use of tax services and the concept of taxable income primarily applicable to individuals.

ACC 412. FEDERAL TAXES (3)
PR: ACC 411. Continued study of the federal income tax structure. Special topics and the concept of taxable income as it applies primarily to business enterprises.

ACC 421. COST ACCOUNTING AND CONTROL I (4)
PR: FIN 301, ECN 331. Deals with relevant costs for decision making; standards and job order costing, flexible budgeting, direct and absorption costing, regression analysis, and decision models.

ACC 422. COST ACCOUNTING AND CONTROL II (3)
PR: ACC 421. A continuation of ACC 421. The study of cost allocation, capital budgeting, inventory planning and control, joint products, process costing, performance measurement, and transfer pricing.

ACC 423. AUDITING (4)
PR: ACC 302 and ECN 331. Principles and procedures of internal and public auditing. The ethics, responsibilities, standards and reports of professional auditing.

ACC 425. BUDGETING (3)
PR: ACC 421. The development of budgets and their relation to expense and cost control, including the use of standard cost as a budgetary tool.

ACC 481. INDEPENDENT RESEARCH OR DIRECTED READINGS (1-5)
PR: CI. Individual study contract with Instructor and Department Chairman required. The content of the course will be mutually determined by the student and Instructor. Course may be repeated up to 10 hours.

ACC 483. SELECTED TOPICS IN ACCOUNTING (1-5)
PR: CI. The course content will depend on student demand and instructor's interest.

FOR SENIORS AND GRADUATE STUDENTS

ACC 501. ACCOUNTING CONCEPTS AND METHODOLOGY I (3)
A study of basic accounting principles including the recording of transactions and the preparation and interpretation of financial statements.

ACC 502. ACCOUNTING CONCEPTS AND METHODOLOGY II (3)
PR: ACC 501. A continuation of ACC 501. Consideration is given to budgeting and cost accounting. Emphasis is placed upon the analysis of financial condition and business operations through an understanding of accounting statements and reports.

FOR GRADUATE STUDENTS ONLY

ACC 601. MANAGERIAL ACCOUNTING AND CONTROL (3)
PR: Business Core or equivalent. A study of the relevancy and limitations of accounting measurement as a basis for business decision-making. Includes a review of fundamental accounting measurement theory and related tax implications.

ACC 602. MANAGERIAL ACCOUNTING AND CONTROL (3)
PR: ACC 601. The relevancy and limitation of cost information in business decision-making. Emphasis is oriented towards the role of cost accounting measurements in: (1) planning and controlling current operations; (2) special decisions and long-range planning; (3) inventory valuation and income determination.

ACC 605. DEVELOPMENT OF ACCOUNTING THOUGHT (3)
PR: 24 quarter hours in accounting or CI. A study and evaluation of the development and evolution of current account theory and measurement concepts. The definition of accounting objectives and goals and the development of measurement models.

ACC 606. CONTEMPORARY ACCOUNTING THOUGHT (3)
PR: ACC 605 or CI. Concentrated study of current problems areas in the field of accountancy.

ACC 607. SYSTEMS THEORY AND QUANTITATIVE APPLICATIONS (3)
PR: ACC 405 or equivalent. The design and operation of contemporary accounting systems including the relevance of data processing and statistical methods to the system of financial information and control.

ACC 611. FEDERAL TAX RESEARCH AND PLANNING (3)
PR: ACC 411 or CI. A study of the the development of tax law and its implication in business decisions. Tax planning and tax research are emphasized.

ACC 621. MANAGEMENT COST ANALYSIS AND CONTROL (3)
PR: 24 quarter hours of accounting or CI. Measurement, interpretation, planning, and control of costs by means of predetermined standards and variance analysis. Use of accounting and statistical information in preparing budgets and controlling operations.

ACC 623. ETHICS AND RESPONSIBILITIES IN PROFESSIONAL ACCOUNTANCY (3)
PR: ACC 423 or equivalent. The study of elements of public accounting practice, professional conduct, auditing principles and reporting standards. The relationship of the field of public accounting to federal and state agencies.

ACC 681. DIRECTED RESEARCH (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

ACC 683. SELECTED TOPICS IN ACCOUNTING (1-6)
PR: CC. The course content will depend on student demand and instructor's interest. May be repeated up to 6 hours.

AFRO-AMERICAN STUDIES (AFA)

Director: F. U. Ohaegbulam; Associate Professor: F. U. Ohaegbulam; Assistant Professors: J. W. Dudley, S. J. Garcia, K. R. Glover.

LOWER LEVEL COURSES

AFA 230. INTRODUCTION TO AFRO-AMERICAN STUDIES (4)
Fundamental perspectives on the nature and meaning of the Afro-American experience and the role of Afro-American Studies in articulating major problems in American and world society. (Formerly AFA 130.)

AFRO-AMERICAN STUDIES (AFA)

UPPER LEVEL COURSES

AFA 333. INTRODUCTION TO AFRICAN HISTORY (4)
An outline survey of precolonial African history including a prefatory introduction to the use of primary sources (such as archaeology, oral tradition, cultural anthropology, comparative linguistics, documents) in reconstructing the African past.

AFA 334. AFRICAN HISTORY SINCE 1850 (4)
Survey of the colonial and post-colonial history of Africa. Emphasis on the impact of European and other alien
influences on the continent, emergence of independent African states and post-independence problems of nation building and economic development.

**AFA 335-336. AFRO-AMERICAN HISTORY** (4,4)
A survey of African-American history in Western Hemisphere. Emphasis on the experience in North America (AFA 335: 1493-1865; AFA 336: 1865-to present.) (Formerly AFA 261-262.)

**AFA 337. BLACKS IN AMERICAN POLITICAL PROCESS** (4)
An examination of the political experience of blacks in the American political process including their political socialization, and struggle to become effective participants in the American political process.

**AFA 341. ARTS AND MUSIC OF THE AFRICAN PEOPLE** (4)
An examination of the visual arts — painting, sculpture, architecture and music of African people in the Sub-Saharan Africa, the Caribbean and the United States. Particular attention to how blacks have expressed the meaning, suffering and triumph of their lives through legitimate theatre, visual arts, and musicalis and the role of black artists in the historical struggle for black consciousness and liberation.

**AFA 343. THE AFRICAN DIASPORA AND PAN-AFRICANISM** (4)
An examination of the African Diaspora and the influence of African culture and civilization on the growth and development of world cultures. Emphasis on the extent to which African culture has enriched the development of mankind, the cultural significance of African voyages and migrations to Asia, Europe and the Americas, and the historical quest for racial and continental pan-Africanism including Garveyism.

**AFA 428. GOVERNMENT AND POLITICS OF AFRICA** (4)
Designed to provide the information and analytical tools necessary to interpret current Sub-Saharan African policies. Survey of political organizations in traditional African societies; politics under colonial rule; the struggle for independence, and post-independence politics.

**AFA 431. SOCIAL INSTITUTIONS AND THE GHETTO**
A study of social institutions as they relate to the American Black ghetto, with emphasis on social systems operating within and on the ghetto. (Formerly AFA 302.)

**AFA 432 BLACK AMERICANS IN THE AMERICAN ECONOMIC PROCESS** (4)
Brief economic history of Black America emphasizing the impact of racial discrimination and evaluating proposals for improvement as they apply to Black Americans and other minority groups. (Formerly AFA 310).

**AFA 438 AFRICA IN WORLD POLITICS** (4)
Study of international relations in the new Africa including the relations of the new states with the major world powers and their role in the United Nations.

**AFA 440. CONTEMPORARY BLACK PHILOSOPHY** (4)
Major themes and participants in the Black liberation movement since 1900 (Formerly AFA 410).

**AFA 442. GOVERNMENT AND POLITICS OF WEST AFRICA** (4)
In depth study of government, political systems and processes in West Africa including political developments, ideologies, problems and prospects of political and economic development and military regimes in the area.

**AFA 443. GOVERNMENT AND POLITICS OF EAST, CENTRAL AND SOUTHERN AFRICA** (4)
In depth study of political developments, ideologies and modernization in East, Central and Southern Africa including race relations and white minority rule and Portuguese colonialism in Southern Africa.

**AFA 444. EDUCATIONAL DEVELOPMENT IN THE AFRICAN WORLD** (4)
An examination of educational systems and experiences of African peoples' cultural past and needs for their future. In tracing the development of education in the African world, close attention will be paid to changing structures and functions of education as manifestations of governmental needs and desires. Similarities and contrasts of African and Afro-American educational patterns will be explored.

**AFA 481. RESEARCH AND FIELD STUDIES** (1-4)
A course linking the study pursued by the student with research and work projects in the Tampa Black community.

**AFA 483. SELECTED TOPICS IN AFRO-AMERICAN STUDIES** (1-4)
Topics offered are selected to reflect student needs and faculty interests. In depth study in such areas as the Black Student and the American Educational Process; the Black Experience in the Americas; European Expansion in Africa to 19th century: Contemporary Economic Problems in Africa.

**AFA 484. AFRICA AND THE UNITED STATES** (4)
A consideration of the nature and character of African cultural survivals in America including an examination of the historical and current political, economic, and cultural relations between the United States and Africa.

**AFA 485. DIRECTED READINGS** (2-4)
Independent readings in a particular area of Afro-American Studies, selected by student and instructor.

**AFA 491. SENIOR SEMINAR** (4)
In-depth study of a particular topic in the area of Afro-American Studies. Individual research by students required.

**AFA 499. SEMINAR IN TEACHING BLACK STUDIES** (4)
An examination of instructional media, resources and approaches relevant to the study and teaching of the black experience.

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**AGING STUDIES (GERONTOLOGY) (AGE)**

**Director:** T. A. Rich; **Professors:** T. A. Rich, S. V. Saxon, W. Vasey; **Associate Professors:** D. R. Kenerson, W. P. Mangum.

### UPPER LEVEL COURSES

**AGE 301. INTRODUCTION TO GERONTOLOGY** (3)
This course is designed to be an introduction to the study of aging. The aging process is viewed from a multi-disciplinary perspective including the biological, psychological, and sociological aspects of aging.

**AGE 315. APPLIED GERONTOLOGY** (4)
**PR:** CI. This course is designed to provide an integration of empirical data in the study of aging with practical experience in working with older people. Students will spend time actually working with older people in an agency or institutional setting and then will use experiences in conjunction with other available data to gain perspective in this field.

**AGE 325. CULTURE, SOCIETY AND AGING** (4)
This course is designed to allow the student to consider aging within the context of culture and society. Emphasis will be given to cultural attitudes toward aging in the U.S. and to implications of cultural attitudes for human behavior.

**AGE 405. SEMINAR IN SELECTED TOPICS IN SOCIAL GERONTOLOGY** (3)
**PR:** CI. This course will provide upper level students with a seminar experience in discussing topics of interest and social relevance in the field of aging. Each student will be required to prepare a seminar paper and present it.

**AGE 485. DIRECTED READINGS** (1-3)
**PR:** CI. A reading program with topics in gerontology conducted under the supervision of a faculty member.
FOR SENIORS AND GRADUATE STUDENTS

AGE 501. PHYSIOLOGY OF AGING (4)
PR: CI. Lectures and discussion concerned with the biological bases of the aging phenomenon as it occurs on the levels of the cells, organs, tissues, and organism.

AGE 502. PSYCHOLOGY OF AGING (4)
PR: CI. Consideration of basic psychological processes as related to the aging process, changes in functioning and perceptual motor and cognitive-areas from the developmental perspective.

AGE 503. SOCIOLOGICAL ASPECTS OF AGING (4)
PR: CI. Examines, within a sociological frame of reference, the inter-relationships between the aged (or aging) and the structure and function of the social system and its major institutionalized subsystems.

AGE 504. AGING AND PERSONALITY (4)
PR: CI. An introduction to personality theory and concepts of adjustment with an overview of counseling techniques and rehabilitative efforts with the aged.

AGE 507. ECONOMICS AND AGING (4)
PR: CI. A study of the basic processes of macroeconomic thought in the modern mixed economy and what influences these processes have on the subject of aging. The course will include discussions on economic issues pertinent to aging such as income maintenance, problems, theories of consumption and income, and labor force problems.

AGE 509. LEISURE FOR THE AGING (4)
PR: CI. This seminar consists of general data and observations on trends and research in the leisure field, directed theoretical analysis of these studies as they pertain to the elderly and contact with progress by visits, interviews, and reports.

AGE 585. DIRECTED READINGS (1-3)
PR: CI. A reading program with topics in gerontology conducted under the supervision of a faculty member.

FOR GRADUATE STUDENTS ONLY

AGE 603. SOCIAL RESEARCH METHODS APPLIED TO GERONTOLOGY (4)
PR: CI. Systematic study of the methods and techniques employed in social, psychological, and health studies of population groups. Directed toward the consumers of research findings—persons whose positions call for the ability to interpret, evaluate, and apply the findings produced by others.

AGE 605. INTERPERSONAL RELATIONS PRACTICUM (4)
PR: CI. A practicum involving students in group and individual settings in interaction with older persons. Content will include implications from interviewing, counseling, and current conceptions of personality in the aged.

AGE 606. INSTITUTIONAL ADMINISTRATION (4)
PR: CI. This course deals with the management problems and practices in the administration of institutions in the field of aging. Consideration is given to the economics of aging, federal and state legislation, the management of people, and fiscal management.

AGE 608. HUMAN RELATIONS IN ORGANIZATIONS (4)
PR: CI. An analytical view of the modern human relations movement with stress on development since the 1930's. Incorporates the philosophy of the behavioral sciences and alternative theories and relates them to the management process.

AGE 610. ADMINISTRATIVE APPLICATIONS OF DEMOGRAPHY (4)
PR: CI. Acquaints the student with various sources of demographic data and its use. Emphasis is placed upon applicability in program planning and student experience in locating, tabulating, and interpreting data from selected publications.

AGE 611. PROJECTS IN AGING I (1-6)
PR: CI. In-depth study of special topics with the objective of identifying problems for research and developing research proposals.

AGE 612. PROJECTS IN AGING II (1-6)
PR: AGE 611 and CI. A continuation of AGE 611.

AGE 690, 691, 692, 693. SEMINAR IN SOCIAL GERONTOLOGY (2)
PR: CI. Designed to give the graduate student an opportunity to integrate concepts within the field of gerontology and relate these to other fields of study. Guest lecturers from a variety of disciplines participate in the seminar. (S/U only.)

AGE 696. FIELD PLACEMENT (12)
PR: CI. Internship in an agency or setting. An assignment to an agency or organization engaged in planning or administering programs for older people or in providing direct services to older people. (S/U only.) (Formerly AGE 695.)

AMERICAN STUDIES (AMS)


LOWER LEVEL COURSES

AMS 201. ISSUES IN AMERICAN CIVILIZATION (2)
Through lecture and demonstration an examination of such topics as natural environment and the quality of life, Architecture and American society, leisure and technology, jazz music, the role of higher education in America, the American success myth and the status of the arts in America.

UPPER LEVEL COURSES

AMS 301. INTRODUCTION TO AMERICAN CIVILIZATION (5)
Integration of major aspects of American life between 1898 and 1914. Should be taken the first term a student becomes an American Studies major. Elective for non-majors.

AMS 311. THE COLONIAL PERIOD (5)
Puritan heritage: The pattern of American culture as revealed through an examination of selected writings and pertinent slides and recordings dealing with the art, architecture and music of the period. Elective for non-majors.

AMS 312. THE AGRARIAN MYTH (5)
Frontier heritage: The pattern of American culture as revealed through an examination of selected writings and other pertinent materials dealing with American faith and the American frontier environment (the land, city, machine). Elective for non-majors.

AMS 313. AMERICA DURING THE TWENTIES AND THIRTIES (5)
Heritage of the nineteen twenties and thirties: selected interdisciplinary materials are used to examine the relationships among regionalism, nationalism and internationalism during the twenties and thirties. Emphasis is placed on the measure of cultural nationalism attained by the United States during this period. Elective for non-majors.

AMS 321. ARCHITECTURE AND THE AMERICAN ENVIRONMENT (4)
By means of slides, lectures and discussion the course examines 350 years of American architectural history. Architectural styles, aesthetics and the relation between a building and its social environment are stressed.

AMS 331. THE AMERICANIZATION OF ENGLISH (4)
An overview of American attitudes toward the English language from colonization to the present. Among the topics
discussed are: the American mania for correctness, the influence of the school marm, place and proper names and language prudery.

AMS 383. SELECTED TOPICS IN AMERICAN STUDIES (1-5)
Offerings include Cultural Darwinism in America, Creative American Women, American Painting: its social implications, American Jazz Music, American Utopias and Communes.

AMS 481. INDIVIDUAL RESEARCH (1-5)
The content of the course will be governed by student demand and instructor's interest. Instructor's approval required prior to registration.

ANCIENT STUDIES (ANC)—see Religious Studies

ANTHROPOLOGY (ANT)


LOWER LEVEL COURSES

ANT 201. INTRODUCTION TO ANTHROPOLOGY (4)
A general survey of physical anthropology, archaeology, linguistics and cultural anthropology.

ANT 311. PHYSICAL ANTHROPOLOGY (4)
PR: ANT 201 or CI. The comparative study of human physical variations and origins.

ANT 321. ARCHAEOLOGY (4)
PR: ANT 201 or CI. The comparative study of past cultures and societies.

ANT 331. CULTURAL ANTHROPOLOGY (4)
PR: ANT 201 or CI. The comparative study of cultures and societies.

ANT 371. THE ANTHROPOLOGICAL PERSPECTIVE (4)
Anthropological concepts relevant to contemporary life. Designed for non-anthropology majors. May not be counted for credit toward an anthropology major.

ANT 401. SELECTED TOPICS IN LINGUISTIC ANTHROPOLOGY (3-6)
PR: LIN 301, ANT 201 or CI. A detailed study of current issues such as the relationship of language and culture, ethnographic semantics, or paralinguistic phenomena. May be repeated as topics vary.

ANT 411. SELECTED TOPICS IN PHYSICAL ANTHROPOLOGY (3-6)
PR: ANT 201-311 or CI. A detailed study of current issues such as paleo-pathology, human races, or social biology. May be repeated as topics vary.

ANT 421. SELECTED TOPICS IN ARCHAEOLOGY (3-6)
PR: ANT 201-321 or CI. A detailed study of current issues such as the development of civilization, regional chronologies, or historical archaeology. May be repeated as topics vary.

ANT 431. SELECTED TOPICS IN CULTURAL ANTHROPOLOGY (3-6)
PR: ANT 201-331 or CI. A detailed study of current issues such as socio-cultural change, ethnopsychology, or social structure. May be repeated as topics vary.

ANT 441. REGIONAL ANTHROPOLOGY (3-6)
PR: ANT 201-331 or CI. A survey of cultures and societies in a limited area or region. May be repeated as topics vary: (1) Indians of North America; (2) Cultures of Africa; (3) Cultures of the Pacific; (4) Cultures of Mesoamerica; (5) Cultures of the Middle East; (6) Specified areas such as Asia, Southeastern U.S. or Florida depending on current interest and staff.

AMS 483. SELECTED TOPICS IN AMERICAN STUDIES (1-5)
Offerings include The American Success Myth, The American Counter Culture, The American City: Past, Present and Future, America as seen by Foreign Travelers.

AMS 491. SENIOR SEMINAR IN AMERICAN STUDIES (4)
PR: Senior in American Studies or CI.

AMS 492. SENIOR SEMINAR IN AMERICAN STUDIES (4)
PR: AMS 491.

AMS 493. SENIOR SEMINAR IN AMERICAN STUDIES (4)
PR: AMS 491, AMS 492.

ANT 461. HISTORY OF ANTHROPOLOGICAL THEORY (4)
PR: LIN 301, ANT 311-321-331 or CI. Survey and analysis of the development of theory and method.

ANT 471. METHODS IN ANTHROPOLOGY (3-6)
PR: CI. Study and application of a selected field or laboratory method in anthropology. Prerequisites will depend on area of study and will be determined by consultation with instructor in advance of registration. May be repeated as topics vary: (1) Archaeological Field Methods; (2) Field Methods in Cultural Anthropology; (3) Laboratory Methods in Archaeology; (4) Laboratory Methods in Physical Anthropology; (5) Others as specified.

ANT 481. INDIVIDUAL RESEARCH (3-6)
PR: CI. Individual guidance in a selected research project.

ANT 485. DIRECTED READING (1-6)
PR: CI. Individual guidance in concentrated reading on a selected topic in anthropology.

ANT 491. SENIOR SEMINAR IN ANTHROPOLOGY (4)
PR: Senior standing with major in anthropology, or equivalent. A seminar approach to the integration of the fields of anthropology. Designed to help the student refocus on and come to a better understanding of the nature of anthropology.

FOR SENIORS AND GRADUATE STUDENTS

ANT 571. SEMINAR IN ANTHROPOLOGY (3-6)
PR: CI. Topics to be chosen by students and instructor.

ANT 581. INDIVIDUAL RESEARCH (3-6)
PR: CI. Individual guidance in a selected research project.

ANT 585. DIRECTED READING (1-6)
PR: CI. Individual guidance in concentrated reading on a selected topic in anthropology.

FOR GRADUATE STUDENTS ONLY

ANT 601. SEMINAR IN ANTHROPOLOGICAL LINGUISTICS (3)
PR: Graduate standing. One of four core courses required of all students. A critical survey of anthropological linguistics emphasizing contributions to applied anthropology. Open to non-majors.

ANT 611. SEMINAR IN PHYSICAL ANTHROPOLOGY (3)
PR: Graduate standing. One of four core courses required of all students. A critical survey of physical anthropology emphasizing contributions to applied anthropology. Open to non-majors.

ANT 621. SEMINAR IN ARCHAEOLOGY (3)
PR: Graduate standing. One of four core courses required of all students. A critical survey of archaeology emphasizing contributions to applied anthropology. Open to non-majors.

ANT 631. SEMINAR IN CULTURAL ANTHROPOLOGY (3)
PR: Graduate standing. One of four core courses required of
all students. A critical survey of cultural anthropology emphasizing contributions to applied anthropology. Open to non-majors.

ANT 634. ANTHROPOLOGY TODAY
PR: CI. A graduate level survey of contemporary anthropology primarily intended for graduate students in Social Science Education.

ANT 641. METHODS IN MEDICAL ANTHROPOLOGY
PR: Three of the core courses, or CI. Field techniques, methods of collection, analysis, and interpretation of data. May be repeated up to 8 credit hours as topics vary. Open to non-majors. Lec-lab, field trips.

ANT 644. METHODS IN URBAN ANTHROPOLOGY
PR: Three of the core courses, or CI. Field techniques, methods of collection, analysis, and interpretation of data. May be repeated up to 8 credit hours as topics vary. Open to non-majors. Lec-lab, field trips.

ANT 657. METHODS IN PUBLIC ARCHAEOLOGY
PR: Three of the core courses, or CI. Field techniques, methods of collection, analysis, and interpretation of data. May be repeated up to 8 credit hours as topics vary. Open to non-majors. Lec-lab, field trips.

ANT 651. SELECTED TOPICS IN MEDICAL ANTHROPOLOGY
PR: Three of the core courses, or CI. Current topical issues in medical anthropology. May be repeated up to 8 credit hours as topics vary. Open to non-majors.

ANT 654. SELECTED TOPICS IN URBAN ANTHROPOLOGY
PR: Three of the core courses, or CI. Current topical issues in urban anthropology. May be repeated up to 8 credit hours as topics vary. Open to non-majors.

ART (ART)


LOWER LEVEL COURSES

ART 201. VISUAL CONCEPTS I
(4) Studio problems supplemented by reading and discussion. Consideration of spatial organization of the two-dimensional surface.

ART 202. VISUAL CONCEPTS II
(4) Studio programs supplemented by reading and discussion. Consideration of three-dimensional organization of space and mass.

UPPER LEVEL COURSES

ART 301. BASIC SEMINAR
(2) Philosophical dimensions of art. Discussion of purposes of art and the relationship of art to life.

ART 304. DRAWING I
PR: ART 201 and ART 301. Drawing as a means of formal organization. Introduction to intermediate drawing methods and media.

ART 310. INTRODUCTION TO ART
(3) An introductory course for the student who does not intend to major in art. (S/U only.)

ART 311. PAINTING I
PR: ART 201, 301, 304. Intermediate problems in painting with an emphasis on the exploration of methods and media and the development of individual concepts.

ART 321. SCULPTURE I
PR: ART 202 and ART 301. Intermediate problems in sculpture with emphasis on the exploration of materials and media and the development of individual concepts.

ART 331. CERAMICS I
PR: ART 202 and ART 301. Intermediate problems in ceramics with an emphasis on the exploration of methods and media and the development of individual concepts.

ART 340. GRAPHICS I
PR: ART 201, 301, 304. Introduction to the graphics media: Intaglio, Lithography, Silkscreen.

ART 361. PHOTOGRAPHY I
PR: ART 201 and ART 301. Intermediate problems in photography with emphasis on the exploration of materials and media and the development of individual concepts.

ART 365. CINEMATOGRAPHY I
PR: ART 201 and ART 301. Intermediate problems in cinematography with emphasis on the exploration of materials and media and the development of individual concepts.

ART 391. TECHNIQUES SEMINAR: SELECTED TOPICS
PR: ART 201, ART 202, ART 301 and CI. Concentration in specialized technical data and process. May be repeated for credit for different topics only.

ART 401. DRAWING II
PR: ART 304. Continued problems in drawing. May be repeated.

ART 411. PAINTING II
PR: ART 311. Continued problems in painting. May be repeated.

ART 421. SCULPTURE II

ART 431. CERAMICS II
PR: ART 331. Continued problems in ceramics. May be repeated.

ART 441. LITHOGRAPHY II
ART 442. INTAGLIO II

ART 443. SILKSCREEN II

ART 453. ART SENIOR SEMINAR
PR: Senior Status. To aid majors to understand, appraise and perfect their own art and technique through critical and aesthetic judgments of their colleagues. Discussion and critical evaluation.

ART 461. PHOTOGRAPHY II
PR: ART 361. Continued problems in photography. May be repeated.

ART 464. INTRODUCTION TO THE PERSONAL FILM
PR: ART 365. Comparison of philosophical and technical distinctions between the personal film and theatrical or commercial release.

ART 465. CINEMATOGRAPHY II
PR: ART 365. Continued problems in cinematography. May be repeated.

ART 467. SOUND TECHNIQUES
PR: ART 365. The recording and editing of sound for film. Collaboration with other departments, particularly Music and Theatre, is encouraged. To be taken concurrently with ART 465 or ART 565 whenever possible.

ART 470. PREHISTORIC AND ANCIENT ART
A comprehensive study of Paleolithic, Neolithic, Egyptian, Assyrian and Mesopotamian painting, sculpture and architecture.

ART 471. GREEK AND ROMAN ART
A comprehensive study of Aegean, Mycenaean, Etruscan, Greek and Roman painting, sculpture, and architecture.

ART 472. MEDIEVAL ART
A comprehensive study of early Christian, Byzantine and Medieval painting, sculpture, architecture and manuscript illumination.

ART 473. RENAISSANCE ART
A comprehensive study of Renaissance and Mannerist painting, sculpture and architecture in Italy and Northern Europe.

ART 474. BAROQUE AND ROCOCO ART
A comprehensive study of the painting, sculpture and architecture in France, Italy, Spain and the Netherlands in the seventeenth and early eighteenth centuries.

ART 475. NINETEENTH CENTURY ART
A comprehensive study of nineteenth century painting, sculpture and architecture in France and England.

ART 476. TWENTIETH CENTURY ART
A comprehensive study of painting, sculpture and architecture from Cezanne to the present in Europe and the United States. Required of all art majors.

ART 477. ORIENTAL ART
An introduction to concepts of the arts of China, Japan and other Far Eastern countries.

ART 481. DIRECTED STUDY
PR: CC. Independent studies in the various areas of Visual Arts. Course of study and credits must be assigned prior to registration. May be repeated.

ART 482. VIDEO ARTS I
PR: ART 201 and ART 301 and CI. A course designed to acquaint the student with the use and maintenance of primary portable equipment and introduction to the design and realization of creative TV presentation as an art form.

ART 483. VIDEO ARTS II
PR: ART 482. An elaboration of portable recording techniques for use in individual art projects.

ART 484. SEMINAR IN VIDEO ARTS
PR: ART 201 and ART 301. An examination of various aspects of transmission of visual images as they relate to the concerns of artists.

ART 485. DIRECTED READING
PR: CI and CC. A course of reading and study in an area of special concern governed by student demand, instructor interest, and/or departmental requirements. Selection of study area and materials for the course must be agreed upon and appropriate credit must be assigned prior to registration. A contract with all necessary signatures is required for registration. May be repeated for credit for different study areas only.

ART 491. IDEA SEMINAR
PR: ART 301. Readings, discussion. Subjects will change each quarter, determined by mutual student and faculty interests. May be repeated.

ART 498. CRITICAL STUDIES IN ART HISTORY
PR: CI. Specialized intensive studies in art history. Specific subject matter varies. To be announced at each course offering. May be repeated for different topics only. (Formerly ART 570.)

ART 499. SEMINAR IN THE HISTORY OF ART
PR: Four courses in Art History at the 400 level, CI. An examination of the origins of Art History as a discipline and the changing nature of Art History from Vasari to the present. (Formerly ART 573.)

FOR SENIORS AND GRADUATE STUDENTS
Admission to all 500-level studio courses by Consent of Instructor.

ART 501. DRAWING

ART 511. PAINTING
PR: ART 411. Advanced problems in the various painting techniques. Emphasis on individual creative expression. May be repeated.

ART 521. SCULPTURE
PR: ART 421. Advanced problems in the various techniques of sculpture. Emphasis on individual creative expression. May be repeated.

ART 531. CERAMICS
PR: ART 431. Advanced problems in the various ceramic techniques, including throw and glaze calculation. May be repeated.

ART 541. LITHOGRAPHY
PR: ART 441. Advanced problems in various lithographic techniques. Emphasis on individual creative expression. May be repeated.

ART 542. INTAGLIO
PR: ART 442. Investigations into more complex intaglio processes including photoengraving and color printing procedures. Emphasis on personal conceptual development in graphic media. May be repeated.

ART 543. SILKSCREEN
PR: ART 443. Advanced problems in the various silkscreen techniques. Emphasis on individual creative expression. May be repeated.

ART 561. PHOTOGRAPHY
PR: CI. Advanced work in photography and related media leading to development of personal/expressive statements. May be repeated.

ART 562. ADVANCED EDITING TECHNIQUES
PR: ART 465. Focus on advanced techniques and theory of editing for the film artist. May be repeated.
### ART 563. ADVANCED FILM TECHNIQUES
PR: ART 465. Description and demonstration of special film manipulation techniques for the artist. Optical printing, infrared film, computer filmmaking, polyvision, television manipulated film. Students will create original experimental works. May be repeated.

### ART 564. ANATOMY OF THE PERSONAL FILM

### ART 565. CINEMATOGRAPHY
PR: ART 465. Advanced studio work using black and white, color and sound as technical and aesthetic factors in visual, artistic productions. May be repeated.

### ART 566. ANATOMY OF THE COLLABORATIVE FILM
PR: ART 465. Analysis of aesthetic and other selected aspects of film produced through collaborative efforts. May be repeated.

### ART 567. SEMINAR IN THE PERSONAL FILM
PR: ART 464, ART 465 and ART 566. Discussion of techniques, approaches and motivations open to and pursued by established film artists. May be repeated.

### ART 568. SELECTED TOPICS IN THE HISTORY OF FILM
PR: ART 569. In depth investigation of a selected period, development or school in the history of film as art. May be repeated.

### ART 569. PURE CINEMA AS AUTONOMOUS VISUAL EXPRESSION
PR: ART 461 or CI. Consideration of historical development in cinematography emphasizing uses of special technical and visual possibilities unique to the aesthetics of the film art. May be repeated.

### ART 581. RESEARCH
PR: CC. May be repeated.

### ART 582. VIDEO ARTS III
PR: ART 483. An experimental approach to video-image thinking and the uses of video for the artist, demonstrating advanced special video techniques. May be repeated.

### ART 591. TECHNIQUES SEMINAR: SELECTED TOPICS
PR: ART 201, ART 202, ART 301, the topic-technique-related 300-400 level studio sequence, and CI. Concentration in specialized technical data and process. May be repeated for credit for different topics only.

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### ASTRONOMY (AST)

(See also the sections entitled Physical Sciences and Natural Sciences)

**Chairperson:** H. K. Eichhorn-von Wurmb; **Professors:** H. K. Eichhorn-von Wurmb, J. H. Hunter Jr., S. Sofia, R. E. Wilson; **Associate Professors:** E. J. Devinney Jr., C. A. Williams; **Assistant Professor (Visiting):** H. Smith Jr.; **Instructor:** F. W. Fallon; **Planetarium Director:** J. A. Carr.

#### LOWER LEVEL COURSES

**AST 203. DESCRIPTIVE ASTRONOMY I**
History of astronomy, celestial phenomena, timekeeping, astronomical instruments, properties of light, contents and elementary dynamics of the solar system. Descriptive approach with a minimum of mathematics. No credit for astronomy majors.

**AST 204. DESCRIPTIVE ASTRONOMY II**
Distances, fundamental properties and evolution of stars; the sun as a star, unusual stars (exploding stars, pulsating stars, etc.); the nature of the Galaxy and other galaxies, cosmology. Descriptive approach with a minimum of mathematics. No credit for astronomy majors.

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### FOR GRADUATE STUDENTS ONLY

**ART 601. DRAWING**
PR: CI. May be repeated.

**ART 611. PAINTING**
PR: CI. May be repeated.

**ART 621. SCULPTURE**
PR: CI. May be repeated.

**ART 631. CERAMICS**
PR: CI. May be repeated.

**ART 641. LITHOGRAPHY**
PR: CI. May be repeated.

**ART 642. INTAGLIO**
PR: CI. May be repeated.

**ART 643. SILKSCREEN**
PR: CI. May be repeated.

**ART 661. PHOTOGRAPHY**
PR: CI. May be repeated.

**ART 665. CINEMATOGRAPHY**
PR: CI. May be repeated.

**ART 670. ART HISTORY**
PR: CI. May be repeated.

**ART 681. DIRECTED RESEARCH**
PR: GR. Master's level. Repeatable. (S/U only.)

**ART 682. GRADUATE SEMINAR**
PR: CI. Advanced course in the theoretical and conceptual foundations of the visual arts. The specific structure and content to be determined by the instructor. Must be repeated for a minimum of four hours.

**ART 683. SELECTED TOPICS IN ART**
PR: Graduate Standing and CI. A variable credit depending upon the scope and magnitude of the work agreed to by the student and the responsible member of the faculty. May be repeated.

**ART 684. GRADUATE SEMINAR: DOCUMENTATION**
PR: CI. An advanced seminar focused on the problems of documenting in verbal form the development of a body of work in the visual arts.

**ART 694. GRADUATE INSTRUCTION METHODS**
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

**ART 699. THESIS: MASTER'S**
(credit varies) Repeatable. (S/U only.)

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**AST 271. ILLUSTRATIVE ASTRONOMY**
Constellations, use of small telescopes, etc., apparent motions of celestial objects, comets and meteors, seasons and weather. Current events in the space program. Planetarium and open sky demonstrations. Lecture-laboratory. No credit for astronomy majors.

**AST 301. INTRODUCTORY ASTRONOMY I**
CR: MTH 212 or MTH 302 or CI, AST 311. Aspects of sky, coordinate systems, timekeeping, elementary mechanics of planetary motion, nature and properties of light, eclipses, instrumentation. A quantitative first course for science and math majors.

**AST 302. INTRODUCTORY ASTRONOMY II**
CR: MTH 212 or MTH 302. Determination of star positions, distance and motions; solar systems, qualitative spectroscopy and spectral classification of stars; binary stars and clusters, variable stars, photometry, telescopes and instrumentation.
AST 303. INTRODUCTORY ASTRONOMY III (4)
CR: MTH 302 or MTH 212 or CI. Introduction to basic astrophysics and stellar structure and evolution; interstellar medium, nebulae and pulsars; nature and dynamics of the Milky Way and other galaxies, quasars and cosmology. A quantitative introduction to stellar and galactic astronomy for science and math majors.

AST 311. ASTRONOMICAL LABORATORY I (1)
CR: AST 301, required of majors, open to non-majors. Exercises in connection with AST 301. Use of small telescopes, introduction to the use of small calculators.

AST 312. ASTRONOMICAL LABORATORY II (2)
Required of majors. Introduction to astronomical instruments and observing practice, and actual observations at the telescope. Use of auxiliary instruments and reduction of observations.

AST 313. NAVIGATION (3)
PR: Some knowledge of geometry, algebra and trigonometry. Timekeeping, use of sextant, constellation, navigation with minimum equipment, some spherical astronomy.

AST 351. HISTORY OF ASTRONOMY (5)
To familiarize seriously interested students with the history of Astronomy and the influence of this discipline on the development of human knowledge.

AST 371. CONTEMPORARY THINKING IN ASTRONOMY (5)
PR: Junior or senior standing or CI. Current concepts of astronomy and space science of general interest; background facts; artificial satellites, space probes; surface conditions of planets and evolution of the stars; cosmology. No credit for astronomy majors or mathematics majors.

AST 413. GEOMETRY AND KINEMATICS OF THE UNIVERSE (4)
PR: CI. Astronomical coordinate systems and their mutual relationships, time.

AST 414. ANALYTICAL TECHNIQUES IN ASTRONOMY (4)
PR: Calculus and analytic geometry, AST 301, AST 302, AST 303. Newton's and Kepler's laws, two body problem, elementary perturbation theory, rigid body dynamics, tides, numerical analysis, planetary interiors and atmospheres, solar system cosmogony.

AST 443. STELLAR ASTROPHYSICS (5)
PR: AST 302 or CI, MTH 303. The physical characteristics of stars, their measurement, and their distribution. Analysis of stellar radiation. Double stars, associations, clusters, galaxies.

AST 481. UNDERGRADUATE RESEARCH (1-6)
PR: Senior or advanced junior standing and CI. Participation in professional research with a view to publication of results. May be repeated. (S/U only.)

AST 491. ASTRONOMY SEMINAR (1)
PR: Senior or advanced junior standing. May be repeated twice. (S/U only.)

FOR SENIOR AND GRADUATE STUDENTS

AST 521. INTRODUCTION TO CELESTIAL MECHANICS (5)
PR: AST 302 or CI, MTH 302 and some knowledge of differential equations, or CI. The two-body problem, artificial satellites, elements of perturbation theory.

AST 522. BINARY STARS (4)
PR: AST 302 or CI, MTH 302 or CI. Principles used to find the properties of astrometric, eclipsing, spectroscopic and visual binaries.

AST 533. STELLAR CONSTITUTION AND EVOLUTION (4)
PR: AST 443 or CI, PHY 405. CR: MTH 405. Internal constitution of stars, physics of gas spheres, energy generation in stars, theories of stellar evolution.

AST 536. INTRODUCTION TO RADIO ASTRONOMY (4)

AST 583. SELECTED TOPICS IN ASTRONOMY (1-6)
PR: Senior or advanced junior standing or CI. Intensive coverage of special topics to suit needs of advanced students.

FOR GRADUATE STUDENTS ONLY

AST 611. POSITIONAL ASTRONOMY (6)
PR: AST 413 or CI. The accurate determination of relative and absolute star positions and related problems.

AST 621. CELESTIAL MECHANICS (6)
PR: AST 521 or CI. Planetary theory, lunar theory, Hamiltonian systems, canonical variables, restricted three-body problem, artificial satellite theory, equilibrium and resonance. Certain topics will be emphasized according to the needs of the students.

AST 631. STELLAR ATMOSPHERES (4)
PR: AST 443 and MTH 406 or CI. Basic observational data. Thermodynamics of the gaseous state. Elements or spectroscopy. The transfer equation (continuum and lines). The problem of calculation of atmospheres.

AST 661. PHOTOMETRY (4)
PR: AST 302 or CI. MTH 305. Theoretical, observational and instrumental concepts required in astronomical photometry.

AST 681. DIRECTED RESEARCH (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

AST 683. SELECTED TOPICS IN ASTRONOMY (1-6)
PR: CI.

AST 691. GRADUATE SEMINAR (2)
PR: CI. May be repeated. (S/U only.)

AST 694. GRADUATE INSTRUCTION METHODS (1-5)
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

AST 695. GRADUATE RESEARCH METHODS (1-5)
Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

AST 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

BIOLOGY (BIO, BOT, MIC, ZOO)

BIOLOGY

Biology (BIO)

LOWER LEVEL COURSES
BIO 201. FUNDAMENTALS OF BIOLOGY I (4)
A brief overview of living organisms, respiration, photosynthesis, cell structure, and specialization. Lec.-Lab. Qtr. I, II.

BIO 202. FUNDAMENTALS OF BIOLOGY II (4)
Cell division, genetics, reproduction and development, physiology, Lec.-Lab Qtr. II, III.

BIO 203. FUNDAMENTALS OF BIOLOGY III (4)
Neurophysiology, behavior patterns, genetics, and evolution; ecology. Lec.-Disc. Qtr. I, III.

BIO 205. FOODS AND DRUGS (4)
The application of basic biological principles to relevant problems and topics in nutrition and drugs through the consideration of scientific and popular literature. For non-majors.

BIO 206. GENES AND PEOPLE (4)
The application of basic biological principles of human heredity to relevant problems and topics through the consideration of scientific and popular literature. For non-majors.

BIO 207. ENVIRONMENT (4)
The application of basic principles of ecology to relevant problems and topics relating to man's environmental interactions through consideration of scientific and popular literature. For non-majors.

BIO 255. SEX, REPRODUCTION AND POPULATION (4)
The application of basic biological principles from subject areas to relevant problems and topics through the consideration of scientific and popular literature. For non-majors.

BIO 256. EVOLUTION (4)
The application of basic principles of evolution with an emphasis upon man through the consideration of scientific and popular literature. For non-majors.

BIO 271. TOPICS IN BIOLOGY (4)
Lectures, individual reading, movies, classroom discussion and evaluation of selected biological topics reflecting biological principles. For non-majors.

UPPER LEVEL COURSES
BIO 315. HISTOLOGICAL TECHNIQUES (5)
PR: BIO 201-203. Theory and practice of tissue fixation, embedding, sectioning, and staining; chromosomal squash preparations; nuclear isolation techniques; photomicrography. Lec.-Lab.

BIO 331. GENERAL GENETICS (4)
PR: BIO 201-203. Introduction to genetics including the fundamental concepts of Mendelian, molecular and population genetics. Lec. Qtr. I, II, III.

BIO 345. MAN'S BIOLOGICAL ENVIRONMENT (4)
PR: BIO 201-203. A biological consideration of man's deteriorating relationship with his environment. Emphasis on pollution, pesticides and population.

BIO 372. MAN, MICROBE AND MOLECULE (4)
Origin of life, control of diseases, environmental quality and the use of microorganisms as tools in searching for molecular explanations of living phenomena. For non-majors.

BIO 401. CELL BIOLOGY I (5)
PR: CHM 333, 334, and BIO 331. A discussion of the concept and significance of the cell to biology; biological molecules and metabolic processes within the cell; cellular energy conversion systems; and control of cellular metabolism. Qtr. I, II.

BIO 402. CELL BIOLOGY II (5)
PR: BIO 401. A continuation of Cell Biology I. The structure and function of cells and their organelles; irritability and contraction; cell differentiation, growth, and integration of cellular activity. Qtr. II, III.

BIO 412. INTRODUCTION TO TROPICAL BIOLOGY (5)
PR: BIO 201-203 or CI. The tropical environment and its effect on plant and animal communities. Plant and animal interactions and man's impact on the environment.

BIO 431. EXPERIMENTAL GENETICS (4)
PR: BIO 331 or CI. Experimental analysis of genetic systems. Lec-Lab.: 2 hr. lec.; 2-3 hr. labs.

BIO 445. PRINCIPLES OF ECOLOGY (4)
PR: BIO 201-203. An introduction to the basic principles and concepts of ecology at the ecosystem, community, and population level of organization. Lec.-Disc.

BIO 465. ORGANIC EVOLUTION (4)
PR: BIO 331 or CI. An introduction to modern evolutionary theory. Lecture on population genetics, adaptations, speciation theory, phylogeny, human evolution and related areas.

BIO 481. UNDERGRADUATE RESEARCH (1-6)
PR: CI. Individual investigation with faculty supervision. (S/U only).

BIO 483. SELECTED TOPICS IN BIOLOGY (1-4)
PR: CI.

BIO 485. RESEARCH METHODS IN BIOLOGY I (2)
PR: CI. A laboratory course for advanced students to become acquainted with contemporary biological research, instrumentation and techniques.

BIO 486. RESEARCH METHODS IN BIOLOGY II (2)
PR: CI. See BIO 485.

BIO 491. SEMINAR IN BIOLOGY (1)
PR: CI. Senior or advanced junior standing. May be repeated once. (S/U only).

FOR SENIORS AND GRADUATE STUDENTS (BIO)
BIO 510. CYTOLOGY (4)
PR: BIO 201-203. Survey of the structure and function of cytoplasmic and nuclear components of plant and animal cells. Lec-Lab.

BIO 515. SUBCELLULAR CYTOLOGY (4)
PR: BIO 201-203. A review of biophysical techniques used in biology to include an introduction of X-ray diffraction, bright field, phase, ultra-violet, interference, and electron microscopy. The course will consist of three hours of lecture and one three-hour lab for demonstration of techniques. Lec.-Lab.

BIO 522. NEUROPHYSIOLOGY (4)

BIO 532. MOLECULAR GENETICS (4)
PR: BIO 331. Detailed examination of DNA, RNA and protein synthesis; the effects of mutations on proteins, cellular control; selected aspects of viral, bacterial, and fungal genetics. Lec.-Lab. Qtr. II.

BIO 535. EVOLUTIONARY GENETICS (4)
PR: BIO 331 or CI. Examination of factors such as mutation, migration, natural selection, and genetic drift which modify the genetic structure of populations.

BIO 550. PRINCIPLES OF IMMUNOLOGY (4)
PR: BIO 401 or CI. Course will emphasize the biological principles involved in the vertebrate immune response. It will present the homeostatic, defense, and detrimental aspects of the immune system in terms of basic cellular and molecular mechanisms. Techniques will be described to familiarize the student with the types of immunological tools available to the cellular and molecular biologist.

BIO 583. SELECTED TOPICS IN BIOLOGY (1-4)
PR: CI. Each topic is a course in directed study under supervision of a faculty member.
FOR GRADUATE STUDENTS ONLY

BIO 601. HISTORY OF BIOLOGY (3)
PR: CI. The historical development of biology with emphasis on the origin of important theories and principles.

BIO 612. CHROMOSOME STRUCTURE AND CHEMISTRY (4)
PR: BIO 510. Introduction to the molecular organization of the Eukaryotic chromosome.

BIO 615. ULTRASTRUCTURE TECHNIQUES IN ELECTRON MICROSCOPY (6)
PR: BIO 201-203, BIO 515 or CI. Discussion of theory and techniques in electron microscopy. Emphasis on preparation of biological specimens, electron microscopic optics and use of the electron microscope. Lec.-Lab.

BIO 616. BIOMETRY (4)
PR: MTH 211-213 or CI. An introduction to statistical procedures for research in the biological sciences. Experimental design, analysis of data and presentation of results are emphasized.

BIO 636. POPULATION BIOLOGY (4)
PR: BIO 535 and BIO 616 or CI. Introduction to the theory of population dynamics with emphasis on the genetic and ecological components of population growth, natural selection, and competition between species. Lec.

BIO 641. TROPICAL ECOLOGY (4)
PR: BIO 445. Graduate Standing or CI. A discussion of a series of related ecological topics to illustrate the features peculiar to the tropics.

BIO 651. MARINE PLANKTON SYSTEMATICS (4)
(Also listed as MSC 651, q.v.).

BIO 653. MARINE PLANKTON ECOLOGY (4)
(Also listed as MSC 653, q.v.).

BIO 681. DIRECTED RESEARCH. (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

BIO 683. SELECTED TOPICS IN BIOLOGY (1-6)
PR: CI.

BIO 691. GRADUATE SEMINAR IN BIOLOGY (1)
PR: CI. (S/U only.)

BIO 694. GRADUATE INSTRUCTION METHODS (1-5)
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

BIO 695. GRADUATE RESEARCH METHODS (1-5)
Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

BIO 781. DIRECTED RESEARCH. (credit varies)
PR: GR. Ph.D. level. Repeatable. (S/U only.)

BIO 799. DISSERTATION: DOCTORAL (credit varies)
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

Biology-Botany (BOT)

UPPER LEVEL COURSES

BOT 300. INTRODUCTION TO BOTANY (5)
PR: BIO 201-203 or equivalent. Knowledge of basic biological principles will be assumed. A presentation of the fundamentals of plant life; structure and function of flowering plants; history of agriculture, plants and man; plant distribution and ecology; survey of major plant groups, algae, fungi, bryophytes, ferns, gymnosperms, and flowering plants.

BOT 311. SYSTEMATIC BOTANY (5)
PR: BOT 300. Identification and classification of the more interesting vascular plants of Florida; angiosperm evolution; principles of taxonomy. Conducted largely in the field.

BOT 313. HORTICULTURAL BOTANY (3)
PR: Course in botany, biology or CI. Application of principles of botany to give an understanding of basic horticultural operations; seed sowing, dormancy growth requirements, vegetative propagation, pruning, and related problems. Lec.-Lab.

BOT 314. FIELD BOTANY (3)
PR: BIO 201-203 or CI. Identification and classification of native and naturalized flowering plants of Florida including historical, climatic and floristic aspects of plant communities. Conducted largely in the field. Lec.-Lab.

BOT 371. PLANTS AND MAN (4)
PR: Junior or Senior Standing or CI. The relation of plants to human history and contemporary life. Botanical and economic aspects of plants used as sources of foods, drugs, and other products of importance in everyday life. Origins of cultivated plants. For non-majors.

BOT 417. MYCOLOGY (5)
PR: BOT 300 or CI. A survey of the fungi with emphasis on their taxonomy, morphology, physiology and economic importance. Lec.-Lab.

BOT 419. PLANT ANATOMY (5)
PR: BOT 300. Comparative studies of tissue and organ systems of fossil and present-day vascular plants. Functional and phylogenetic aspects stressed. Lec.-Lab.

BOT 421. PLANT PHYSIOLOGY (5)

BOT 491. SEMINAR IN BOTANY (1)
PR: Senior or advanced junior standing and CI. May be repeated once. (S/U only.)

FOR SENIORS AND GRADUATE STUDENTS

BOT 511. TAXONOMY AND FLOWERING PLANTS (4)
PR: BOT 311 or CI. A phylogenetic study of Angiosperms; relationship of the principal orders and families, problems of nomenclature, identification of specimens, comparisons of recent systems of classification, dissection of representative flower types. Field trips and lab work. Lec.-Lab.

BOT 517. PHYSIOLOGY OF THE FUNGI (5)
PR: BOT 417 or CI. The biochemical, physiological and hormonal basis involved in morphogenesis and cellular control in fungi. Lec.-Lab.

BOT 521. PHYSIOLOGY OF PLANT GROWTH AND DEVELOPMENT (3)
PR: BOT 421, BIO 201-203 and CI. A study of plant development with emphasis of the role of light and growth hormones on the process of flowering, fruit set, ripening, and senescence.

BOT 543*. PHYCOLOGY (5)
PR: BOT 300 or CI. A detailed survey of the algae emphasizing both taxonomy and morphology of fresh and marine water forms; field and laboratory investigations, including individual projects. Lec.-Lab.

BOT 546*. PLANT ECOLOGY (4)
PR: BOT 300, BIO 445, or CI. Distribution and nature of vegetation in relation to climatic, physiographic, edaphic, and biotic factors; field investigations of subtropical Florida plant communities. Lec.-Lab.

BOT 547*. MARINE BOTANY (5)
PR: BOT 300, BIO 445, or CI. A field course in marine plants with emphasis on ecology and functional morphology. Field work will stress the ecological aspects of plants in a subtropical marine environment in Florida. Lec.-Lab.

BOT 583. SELECTED TOPICS IN BOTANY (1-4)
PR: CI. Each topic is a course in direct study under supervision of a faculty member.

*Students will be required to pay travel expenses for field trips.
FOR GRADUATE STUDENTS ONLY

BOT 611. BIOSYSTEMATICS (4)
PR: BOT 311 or equivalent. Application of cytology, ecology, genetics, biochemistry, and morphological analyses to the study of evolution and classification of species of higher plants. Lec.

BOT 612. BIOLOGY OF TROPICAL PLANTS (3)
PR: BIO 412. Special topics in the systematics, morphology, physiology, genetics, and ecology of tropical plants with consideration of habitat diversity that leads to rich florals. Lec.

BOT 613*. LABORATORY IN TROPICAL PLANTS (2)
PR: Must be taken concurrently with BOT 612. Extended field trip to some area of the New World Tropics to examine major types of vegetation and gain familiarity with field techniques; research problem development. Lab.

BOT 621. PLANT METABOLISM LECTURE (3)
PR: BOT 421, CHM 336 or Cl. A study of plant metabolism with emphasis on the biosynthetic pathways and their regulation.

BOT 622. PLANT METABOLISM LABORATORY (4)
PR: BOT 421, CHM 336, or Cl. An intensive exposure to the methods used in experimenting with plant material.

BOT 650. MARINE ALGAL ECOLOGY (3)
(Also listed as MSC 650, q.v.). (Formerly BIO 650)

BOT 699. THESIS: MASTER'S (credit varies)
Repealable. (S/U only.)

Biology-Microbiology (MIC)

UPPER LEVEL COURSES

MIC 351. INTRODUCTION TO MICROBIOLOGY (4)
PR: BIO 201-203; one quarter of organic chemistry and a course in genetics is recommended. Introduction to the biology of microorganisms; structure, physiology and ecology of bacteria, algae, viruses, rickettsiae, and protozoa; basic lab methods in microbiology. Lec.-Lab. Qtr. I, II, III and IV.

MIC 352. GENERAL MICROBIOLOGY LABORATORY (2)
PR: BIO 201-203, CHM 211-213. BIO 331 recommended. At least one quarter of, or concurrent enrollment in, Organic Chemistry is strongly recommended. An introduction to the laboratory practice of microbiology: preparation of culture media, staining, pure culture methodology, isolation of microbes from nature, enumeration techniques, resistance to infectious disease.

MIC 401. LABORATORY METHODS IN DIAGNOSTIC MICROBIOLOGY (3)
PR: MIC 351 or Cl. Laboratory procedures necessary to identify pathogenic and commonly encountered bacteria, fungi, and other parasites will be individually performed. These procedures will include determinations of morphology, physiological reactions, and immunological responses as appropriate.

MIC 402. LABORATORY IN EXPERIMENTAL MICROBIOLOGY (3)
PR: MIC 351, Cl, MIC 456 concurrently. Course will consist of individually performed exercises to teach major techniques in quantitative, experimental microbiology with emphasis on biochemical and physiological examination of bacteria and viruses, their chemical composition, enzymatic, molecular and physical properties.

MIC 451. APPLIED BACTERIOLOGY (5)
PR: MIC 351. A study of the applications of microbiology to industry, agriculture, medicine, and sanitary engineering. Lec.-Lab.

MIC 453. DETERMINATIVE BACTERIOLOGY (4)
PR: MIC 351 or equivalent; CHM 331-336 or equivalent.

*Students will be required to pay travel expenses for field trips.

Survey of bacterial classification; detailed examinations of bacteria important to man in agriculture, in industry and as pathogens. Lec.-Lab. Qtr. II. (Formerly MIC 553.)

MIC 456. MICROBIAL PHYSIOLOGY (3)
PR: MIC 351 or equivalent, CHM 331-334, or Cl. A study of physiological and metabolic phenomena pertinent to the growth, development, regulation, inhibition, and death of microorganisms and to the chemical alterations they catalyze. Laboratory emphasis will be on quantitative methods for the study of microbic activity. Lec.-Lab. (Formerly MIC 556.)

MIC 457. VIROLOGY (4)
PR: MIC 351 or equivalent and Cl. The biology of viruses associated with plants, animals, and bacteria will be considered; the nature of viruses, mechanisms of viral pathogenesis, and interactions with host cells. Lec.-Lab. (Formerly MIC 557.)

MIC 491. SEMINAR IN MICROBIOLOGY (1)
PR: Senior or advanced junior standing and Cl. May be repeated. (S/U only.)

FOR SENIOR AND GRADUATE STUDENTS

MIC 518. MEDICAL MYCOLOGY (3)
PR: MIC 351 or Cl. A survey of the yeasts, molds, and actinomycetes most likely to be encountered by the bacteriologists, with special emphasis on the forms pathogenic for man.

MIC 552. ADVANCED BACTERIOLOGY (4)
PR: MIC 351. Ultrastructure, growth, metabolism, genetics and ecology of the bacteria and related procaryotes.

MIC 583. SELECTED TOPICS IN MICROBIOLOGY (1-4)
PR: Cl. Each topic is a course in directed study under supervision of a faculty member.

FOR GRADUATE STUDENTS ONLY

MIC 654. BACTERIAL GENETICS (3)
PR: BIO 331, MIC 351, MIC 456 or Cl. A survey of the recombinational systems found among the bacteria and bacterial viruses with emphasis on the molecular mechanisms of gene transfer, replication and expression and on the significance of these systems for our understanding of cellular functions. Lec.

MIC 655. ADVANCED IMMUNOLOGY (5)
PR: MIC 351 or equivalent, CHM 331-336 or equivalent. Discussion of the basic immune reaction, nature of antigenicity; basic immunological techniques and their use in biological research and the medical sciences.

MIC 699. THESIS: MASTER'S (credit varies)
Repealable. (S/U only.)

Biology-Zoology (ZOO)

UPPER LEVEL COURSES

ZOO 311. COMPARATIVE VERTEBRATE ANATOMY (6)
PR: BIO 201-203. Anatomy of selected vertebrate types emphasizing evolutionary trends. Lec.-Lab.

ZOO 313. INTRODUCTORY INVERTEBRATE ZOOLOGY (5)
PR: BIO 201-203. An introduction to the major invertebrate groups, with emphasis on local forms. Field work will be required. Lec.-Lab.

ZOO 371. HUMAN PHYSIOLOGY (4)
Lectures and discussions on the mechanisms of function of the human body. For non-majors credit only.

ZOO 411. HISTOLOGY (4)
PR: ZOO 311 and/or ZOO 422. Comparative approach to the study of tissues and the relation of their structure and function. Lec.-Lab.

ZOO 415. INTRODUCTION TO ENTOMOLOGY (4)
PR: BIO 201-203. An introduction to general aspects of insect
morphology, development, and classification. The identification of local forms will be emphasized. Lec.-Lab. Qtr. III, IV.

ZOO 416. VERTEBRATE ZOOLOGY (5)
PR: BIO 201-203. Natural history, morphology, phylogeny and taxonomy of vertebrates. Lec.-Lab.

ZOO 422. DEVELOPMENTAL BIOLOGY (5)

ZOO 423. ANIMAL PHYSIOLOGY (5)
PR: BIO 201-203 and CHM 333. Advanced presentation of mechanisms employed by animals to interact with their environment, and to maintain their organization.

ZOO 460. WILDLIFE AND FISH MANAGEMENT (3)
PR: BIO 201-203, BIO 445. An introduction to the principles of wildlife and fisheries management. Certain methods and techniques utilized in the management of exploited animal species will be introduced. Designed primarily for students interested in the wildlife and fish management profession.

ZOO 461. ANIMAL SOCIAL BEHAVIOR (5)
PR: CI. An introduction to the physical, chemical, and emphasis on social behavior and the evolutionary behavior. Lec.-Lab.

ZOO 462. PRIMATE SOCIAL BEHAVIOR (4)
PR: BIO 201, 202, 203. An introduction to primate social behavior and behavioral ecology based on field-oriented research.

ZOO 491. SEMINAR IN ZOOLOGY (1)
PR: Upper level. May be repeated once. (S/U only.)

FOR SENIORS AND GRADUATE STUDENTS

ZOO 513. PARASITOLOGY (5)
PR: BIO 201-203. Fundamentals of animal parasitology and parasitism; the biology of selected animal parasites, including those of major importance to man. Lec.-Lab. Qtr. II.

ZOO 514. AQUATIC ENTOMOLOGY (4)
PR: ZOO 415. Taxonomy, development, and ecology of aquatic insects with emphasis on local forms. Lec.-Lab. Qtr. II (odd numbered years).

ZOO 515. LIMNOLOGY (5)
PR: CI. An introduction to the physical, chemical, and biological nature of fresh-water environments. Lec.-Lab. Qtr. III.

ZOO 517. ORNITHOLOGY (4)
PR: BIO 445, ZOO 311, and CI. The biology of birds. Field trips emphasize local avifauna. Lec.-Lab. Qtr. III.

ZOO 518. MAMMALOGY (5)
PR: BIO 201-203 and CI. The biology of mammals, including systematics, ecology, natural history, and geographical distribution. Lec.-Lab.

ZOO 519. ICHTHYOLOGY (5)
PR: ZOO 311. Systematics of fishes, including major classification, comparative anatomy, embryology, and general distribution. Lec.-Lab. (Also offered as MSC 519.)

ZOO 520. BIOLOGY OF ECHINODERMS (5)

ZOO 521. COMPARATIVE PHYSIOLOGY (5)
PR: BIO 401-402. The evolution of physiological mechanisms. Lec.-Lab. Qtr. I.

ZOO 525. BIOLOGY OF THE AMPHIBIA (5)
PR: ZOO 311, BIO 445, and CI. Major aspects of amphibian biology emphasizing fossil history, evolutionary morphology, sensory physiology, life history, and reproductive behavior. Lec.-Lab. Field Trips. Qtr. III (even-numbered years).

ZOO 526. BIOLOGY OF THE REPTILIA (5)
PR: ZOO 311, BIO 445 and CI. Major aspects of reptilian biology emphasizing fossil history, evolutionary morphology, sensory physiology, life history, and reproductive behavior. Lec.-Lab. Field Trip. Qtr. III (odd numbered years).

ZOO 545. ZOOGEOGRAPHY (3)

ZOO 556. TERRESTRIAL ANIMAL ECOLOGY (4)
PR: BIO 445. Field and laboratory investigations of the basic principles of ecology as applied to terrestrial animals. Lec.-Lab.

ZOO 557. MARINE ANIMAL ECOLOGY (5)

ZOO 562. MECHANISMS OF ANIMAL BEHAVIOR (5)
PR: BIO 201-203. CHM 331-333, and CI. A comparative approach to communication and orientation in animals including homing behavior and biological clocks. Lec.-Lab.

ZOO 583. SELECTED TOPICS IN ZOOLOGY (1-4)
PR: CI. Each topic is a program in directed study under supervision of a faculty member.

FOR GRADUATE STUDENTS ONLY

ZOO 611. EXPERIMENTAL EMBRYOLOGY (4)
PR: BIO 401-402, ZOO 422 and CI. Lectures, laboratories, readings and discussions relating to contemporary advances in the area of biochemistry of development. Experimental techniques will be studied.

ZOO 618. ADVANCED MAMMALOGY (4)
PR: ZOO 518. Important literature and developments in mammalogy. Students will undertake individual research projects. Lec.-Lab.

ZOO 620. INVERTEBRATE REPRODUCTION AND DEVELOPMENT (5)
PR: ZOO 313 and CI. An analysis of modes of reproduction and patterns of larval development in major invertebrate phyla. Emphasis is on classical descriptive embryology, modern mariculture techniques, and larval ecology. Lec.-Lab.

ZOO 621. PHYSIOLOGICAL ECOLOGY (5)
PR: CI. Effect of environmental factors on animal function at the cellular and organ system level with emphasis on control and mechanism. Lec.-Lab.

ZOO 623. PHYSIOLOGY OF MARINE ANIMALS (5)

ZOO 624. COMPARATIVE ENDOCRINOLOGY (5)
PR: ZOO 521 or CI. An analysis of the similarities and differences between the hormonal mechanisms of mammals, other vertebrates and invertebrates. Lec.-Lab.

ZOO 625. COMPARATIVE METABOLISM (3)
PR: BIO 401-402, CHM 331-334, or CHM 351, or their equivalents. Some knowledge of Animal Physiogeny will be assumed. A presentation of various metabolic pathways found in invertebrate animals including specializations related to parasitism and facultative anaerobiosis.

ZOO 661. ADVANCED ANIMAL BEHAVIOR (4)
PR: ZOO 461 and CI. Recent advances in comparative animal behavior (ethology). Lec.-Lab.

ZOO 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

CHEMISTRY (CHM)

Chairperson: T. C. Owen; Professors: T. A. Ashford, J. S. Binford, R. S. Braman, J. C. Davis, J. E. Fernandez, D. F.

LOWER LEVEL COURSES

CHM 101. FOUNDATIONS OF UNIVERSITY CHEMISTRY
A survey of modern chemistry designed particularly for those with a poor preparation in algebra and/or chemistry as a preliminary to CHM 211. Lec. Qtr. I, III, IV.

CHM 211. GENERAL CHEMISTRY I* (3)
CHM 211 students are expected to have performed well in the placement exam* or to have satisfactorily completed CHM 101. Fundamentals of chemistry; mass and energy relationships in chemical changes, equilibrium, chemical kinetics, atomic and molecular structure, descriptive chemistry of selected elements. Lec. and discussion. Qtr. I, II, III, IV.

CHM 212. GENERAL CHEMISTRY II (3)
PR: CHM 211 or equivalent. Continuation of General Chemistry. Lec. and discussion. Qtr. I, II, III, IV.

CHM 213. GENERAL CHEMISTRY III (3)
PR: CHM 212 or equivalent. Continuation of General Chemistry. Lec. and discussion. Qtr. I, II, III, IV.

CHM 214. ENVIRONMENTAL CHEMISTRY LABORATORY (4)
PR: CHM 212 or equivalent. Fundamental techniques used in environmental chemistry, including basic manipulations and equipment. Lec.-lab.

CHM 215. ACCELERATED GENERAL CHEMISTRY I* (5)
This course is designed for the beginning student who has a superior background in science and mathematics. The laboratory is project oriented. Entrance is by examination only. CHM 215-216 is equivalent to CHM 211-212 and 217-218-219. Lec.-lab and discussion. Qtr. I.

CHM 216. ACCELERATED GENERAL CHEMISTRY II (5)
PR: CHM 215. Continuation of Accelerated General Chemistry. Lec.-lab and discussion. Qtr. II.

CHM 217. GENERAL CHEMISTRY I LAB (1)
PR: CHM 211. Laboratory portion of General Chemistry I. Introduction to laboratory techniques; study of properties of elements and compounds; synthesis and analysis of natural and commercial materials. May not be taken concurrently with CHM 211. Qtr. I, II, III, IV.

CHM 218. GENERAL CHEMISTRY II LAB (1)
PR: CHM 212, 217. Laboratory portion of General Chemistry II. Continuation of chemistry laboratory. May not be taken concurrently with CHM 212. Qtr. I, II, III, IV.

CHM 219. GENERAL CHEMISTRY III LAB (1)
PR: CHM 213, 218. Laboratory portion of General Chemistry III. Continuation of chemistry laboratory. May not be taken concurrently with CHM 213. Qtr. I, II, III, IV.

CHM 271. CURRENT ISSUES IN CHEMISTRY (4)
A survey of the important current issues in which chemistry affects our lives; e.g., environment, drugs, cancer, warfare, etc. No credit for chemistry majors.

CHM 291. JUNIOR SEMINAR (1)
PR: CHM 213 or CHM 216. Interrelations of previous courses, the chemical literature, and examination of the nature of the industrial, government, and academic chemistry. Lecture and discussion. (S/U only.) Qtr. I, II, III, IV.

CHM 303. ELEMENTARY ORGANIC CHEMISTRY (4)
PR: CHM 213 or equivalent. Fundamental organic chemistry principles. One-quarter course for non-chemistry majors only. Lec.-lab.

CHM 311. INTERMEDIATE INORGANIC CHEMISTRY (5)
PR: CHM 213-219 or CHM 216. Fundamental principles of inorganic chemistry. Lec.-lab. Qtr. II, IV.

CHM 321. ELEMENTARY ANALYTICAL CHEMISTRY (5)

CHM 331-332. ORGANIC CHEMISTRY I (3-2)
PR: CHM 213-219 or CHM 216. Fundamental principles of organic chemistry and lab. Lecture and lab may not be taken concurrently. Qtr. I, II, III, IV.

CHM 333-334. ORGANIC CHEMISTRY II (3-2)
PR: CHM 331-332 or equivalent. Continuation of Organic Chemistry and lab. Lecture and lab may not be taken concurrently. Qtr. II, III, IV.

CHM 335-336. ORGANIC CHEMISTRY III (3-2)
PR: CHM 333-334 or equivalent. Continuation of Organic Chemistry and lab. Lecture and lab may not be taken concurrently. Qtr. I, III, IV.

CHM 341. ELEMENTARY PHYSICAL CHEMISTRY (3)
PR: CHM 213/219 or CHM 216, MTH 212, PHY 205-206. Introduction to equilibrium properties of macroscopic systems. Properties of solutions.

CHM 342. ELEMENTARY PHYSICAL CHEMISTRY II (3)
PR: CHM 341. Kinetic behavior of systems, macromolecular solutions, and colloidal dispersions, nuclear chemistry, and spectroscopy.

CHM 343. ELEMENTARY PHYSICAL CHEMISTRY LAB (2)
PR: Co-requisite with CHM 341 and/or CHM 342. A physical chemistry laboratory with emphasis on modern techniques and instruments. Lab.-lec.

CHM 351. INTRODUCTORY BIOCHEMISTRY (4)
PR: CHM 333. Introduction to the chemistry and intermediary metabolism of biologically important substances. Lec. Qtr. I, II, III, IV.

CHM 354. BASIC BIOCHEMISTRY LABORATORY (3)
PR: CHM 351. Practical work in determination and characterization of important biomolecules. Lec.-lab.

CHM 371. MODERN CHEMICAL SCIENCE. (4)
An introduction to some of the major problems in chemistry, its relation to other sciences, and its relevance to contemporary culture. Designed for non-science majors. No credit for Chemistry majors. Qtr. I, IV.

CHM 411. ADVANCED INORGANIC CHEMISTRY (4)
PR: CHM 441 or CI. An advanced theoretical treatment of inorganic compounds. Lec. Qtr. I, II, III, IV. (Formerly CHM 511.)

CHM 421. INSTRUMENTAL ANALYSIS (4)
PR: CHM 443 or CI. Theory and practice of instrumental methods. Clinical Chemistry applications may be elected in the laboratory. Lec.-lab. Qtr. II, III, IV. (Formerly CHM 521.)

CHM 423. RADIOCHEMISTRY (4)
PR: CHM 351. Theory and applications of natural and induced radioactivity. Emphasis on the production, properties, measurement, and uses of radioactive tracers. Lec.-lab. Qtr. I, II. (Formerly CHM 523.)

CHM 425. FUNDAMENTALS OF CLINICAL CHEMISTRY (4)
PR: CHM 321, 351. Theoretical and practical aspects of the analysis of various body fluids, with emphasis on the medical significance. Clinical chemistry majors must take CHM 426 concurrently. Lec. Qtr. I, II, III. (Formerly CHM 525.)
CHM 426. CLINICAL LABORATORY (2)
PR: CHM 321, 351, and CI. Laboratory experience in some of the most important clinical determinations. CHM 425 must be taken concurrently. Lec-lab. Qtr. I, III. (Formerly CHM 526.)

CHM 441. PHYSICAL CHEMISTRY I (4)
PR: CHM 321 and MTH 304. CR: PHY 205 or 305. Thermodynamics, the states of matter, solutions. Lec. Qtr. I, II.

CHM 442. PHYSICAL CHEMISTRY II (4)
PR: CHM 441. Introduction to quantum mechanics and molecular spectroscopy. Lec. Qtr. II, III.

CHM 443. PHYSICAL CHEMISTRY III (4)

CHM 444. METHODS OF CHEMICAL INVESTIGATION I. ANALYTICAL-PHYSICAL (4)
PR: CHM 321, 335-336. CR: CHM 441. Theory and applications of instrumental methods in chemical research with emphasis on electrochemical techniques. Lec.-lab. Qtr. I, II.

CHM 446. METHODS OF CHEMICAL INVESTIGATION II. ANALYTICAL-PHYSICAL (4)

CHM 447. METHODS OF CHEMICAL INVESTIGATION III. CHEMICAL SYSTEMS (3)
PR: CHM 446. Continuation of CHM 446. Emphasis on studies of chemical systems using a variety of techniques. Lec-lab. Qtr. III, IV.

CHM 471. HISTORICAL PERSPECTIVES IN CHEMISTRY (4)
PR: CHM 213; or senior standing, and CI. A study in depth of the historical and philosophical aspects of outstanding chemical discoveries and theories. Lec-disc. Qtr. II.

CHM 475. THE MICROWORLD OF MOLECULES, ATOMS AND ELECTRONS (4)
The nature of the material world from the philosophic discussion of antiquity, through some speculations of the Middle Ages and the Renaissance to the quantitative thinking and measurements of modern science. No previous background in science or mathematics is necessary. No credit for Chemistry majors.

CHM 481. UNDERGRADUATE RESEARCH (1-6)
PR: CI. (S/U only.) Qtr. I-IV.

CHM 483. SELECTED TOPICS IN CHEMISTRY (1-6)
PR: CI. The course content will depend on the interest of faculty members and student demand.

CHM 485. CLINICAL CHEMISTRY PRACTICE (3-8)
PR: CI. Laboratory practice in clinical chemistry laboratories in the Tampa Bay area. (S/U only.) Qtr. I-IV.

CHM 491. CHEMISTRY SEMINAR (1)
PR: Senior standing. Discussions of selected significant chemical topics of recent interest. (S/U only.) Qtr. II, III.

FOR SENIORS AND GRADUATE STUDENTS

CHM 512. PRINCIPLES OF INORGANIC CHEMISTRY (4)
PR: CHM 442 or CI. Chemical forces, reactivity, periodicity, and literature in inorganic chemistry; basic core course. Lec. Qtr. I.

CHM 532. INTERMEDIATE ORGANIC CHEMISTRY (4)
PR: CHM 335, 336 or equivalent. A study of stereochemistry, spectroscopy, theories of bonding, acid-base chemistry, and their application to the understanding of organic reactions. Lec.

CHM 541. CHEMICAL THERMODYNAMICS (4)
PR: CHM 443 or CI. The applications of thermodynamic theory to the study of chemical systems with emphasis on the energetics of reactions and chemical equilibria. Lec.

CHM 542. APPLICATIONS IN PHYSICAL CHEMISTRY
PR: CHM 443. Applications of chemical theory to chemical systems with emphasis on chemical kinetics and molecular spectroscopy. Lec.

CHM 554. TECHNIQUES IN BIOCHEMISTRY (2)
PR: CHM 555 or 657. Biochemistry laboratory with emphasis on modern techniques for use in biochemistry research. Qtr. III.

CHM 555. BIOCHEMISTRY CORE COURSE (4)
PR: Either CHM 335-6 and CHM 341 or 441 or graduate standing. A one-quarter survey course in biochemistry for graduate students in chemistry, biology, and other appropriate fields and for particularly well-qualified undergraduates. Lec. Qtr. III.

CHM 583. SELECTED TOPICS IN CHEMISTRY (1-6)
PR: CI. The following courses are representative of those that are taught under this title: Natural Products, Stereochemistry, Reactive Intermediates, Photochemistry, Instrumental Electronics, Advanced Lab Techniques, Heterocyclic Chemistry, etc.

FOR GRADUATE STUDENTS ONLY

CHM 611. STRUCTURAL INORGANIC CHEMISTRY (4)
PR: CHM 512 or CI. Modern theories of bonding and structure of inorganic compounds, including coordination theory, stereochemistry, solution equilibria, kinetics, mechanisms of reactions, and use of physical and chemical methods. Lec. Qtr. II.

CHM 613. CHEMISTRY OF THE LESS FAMILIAR ELEMENTS (4)
PR: CI. An integrated treatment of the conceptual and factual aspects of the traditionally less familiar elements, including noble-gas elements, unfamiliar non-metals, alkali and alkaline-earth metals and the transition elements. Lec. Qtr. III.

CHM 621. ADVANCED ANALYTICAL CHEMISTRY (4)
PR: CI. A study of complete analytical process, including sample handling, separations, the analysis step, and statistical interpretation of data. Emphasis placed on separations and statistics. Lec. Qtr. II.

CHM 623. ELECTROCHEMISTRY (4)

CHM 631. ADVANCED ORGANIC CHEMISTRY I. NATURAL PRODUCTS (4)
PR: CHM 532 or CI. A study of any of several of the following topics: terpenes, steroids, vitamins, alkaloids, porphyrins, purine, and antibiotics. Qtr. III.

CHM 632. ADVANCED ORGANIC CHEMISTRY II. PHYSICAL-ORGANIC (4)

CHM 633. ADVANCED ORGANIC CHEMISTRY III. SYNTHESIS (4)

CHM 634. ADVANCED ORGANIC CHEMISTRY IV. (4)
PR: CHM 532. The emphasis will vary from year to year.

CHM 641. STATISTICAL THERMODYNAMICS (4)
PR: CI. Application of statistical mechanics to thermodynamics, the relation of molecular structure to thermodynamic properties. Lec. Qtr. II.

CHM 643. QUANTUM CHEMISTRY I (4)
PR: CI. Introduction to elementary quantum mechanism. Atomic structure and spectra. Lec. Qtr. III.

CHM 645. QUANTUM CHEMISTRY II (4)
CHM 647. CHEMICAL KINETICS (4)
PR: CI. Theory and methods for the study of reaction rates and the elucidation of reaction mechanisms. Lec. Qtr. II.

CHM 654. ADVANCED BIOCHEMISTRY I. ENZYMES (4)
PR: CHM 659 or CI. A study of biochemical systems with emphasis on enzymes. Lec.

CHM 655. ADVANCED BIOCHEMISTRY II. BIOORGANIC MECHANISMS (4)
PR: CHM 659 or CI. A study of biochemical systems with emphasis on mechanisms of biological reaction. Lec. Qtr. III.

CHM 656. ADVANCED BIOCHEMISTRY III. BIOPHYSICAL CHEMISTRY (4)
PR: CHM 659 or CI. A study of biochemical systems with emphasis on physical methods of experimentation and interpretation. Lec.

CHM 657. GENERAL BIOCHEMISTRY I. (4)
PR: CHM 555 or CI. First quarter of a rigorous three-quarter general biochemistry course for chemistry and biology graduate students whose primary interests are in this field. Lec. Qtr. I. ( Formerly CHM 551.)

CHM 658. GENERAL BIOCHEMISTRY II (4)
PR: CHM 657. Continuation of General Biochemistry I. Lec. Qtr. II. ( Formerly CHM 552.)

CHM 659. GENERAL BIOCHEMISTRY III (4)
PR: CHM 658. Continuation of General Biochemistry II. Lec. Qtr. III. ( Formerly CHM 553.)

CHM 661. MARINE CHEMISTRY (4)
PR: OGY 521 or CI. Chemical and physical properties of sea water, energy flow in a marine ecosystem, development of the concepts of biogeochemical cycles and master variables, thermodynamics of the carbon dioxide-seawater system, other related topics.

CHM 681. DIRECTED RESEARCH. (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

CHM 683. SELECTED TOPICS IN CHEMISTRY (1-6)
PR: CI. The following titles are representative of those that are taught under this title: Symmetry and Group Theory, Photochemical Kinetics, Quantum Mechanical Calculations, Advanced Chemical Thermodynamics, Reaction Mechanisms, Advanced Instrumentation, Separations and Characterizations, Spectroscopy, etc.

CHM 688. RECENT ADVANCES IN CHEMISTRY WITH EMPHASIS ON THEIR IMPACT ON BEGINNING COURSES (3-6)
PR: Graduate Standing. A course designed to consider and study the recent developments of a given field especially those developments that have an effect on altering the basic concepts and ideas of the field and imply a change in the presentation of introductory material in the field. (S/U only.) Qtr. I-IV.

CHM 691. GRADUATE SEMINARS IN CHEMISTRY (2)
PR: Admission to graduate program. Required every quarter (when offered) for all students enrolled in chemistry graduate program. Requires participation in and contribution to a divisional seminar and attendance at the weekly departmental seminar. Must be repeated. (S/U only.)

CHM 692. CHEMISTRY COLLOQUIUM (1)
PR: Admission to graduate program in Chemistry. Frequent (usually weekly) small-group analysis of current developments. May be repeated up to a cumulative total of 10 hours. (S/U only.)

CHM 694. GRADUATE INSTRUCTION METHODS (1-5)
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

CHM 695. GRADUATE RESEARCH METHODS (1-5)
Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

CHM 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

CHM 781. DIRECTED RESEARCH. (credit varies)
PR: GR. Ph.D. level. Repeatable. (S/U only.)

CHM 799. DISSERTATION: DOCTORAL (credit varies)
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

COMMUNICOLOGY (CLY)

Speech Pathology-Audiology-Aural (Re)Habilitation
Chairperson: S. W. Kinde; Professors: L. H. Ricker, D. C. Shepherd; Associate Professors: J. B. Crittenden, S. W. Kinde, S. I. Ritterman; Assistant Professor: A. M. Guilford; Instructors: R. L. Carlson, J. E. Falany, J. P. Glover, L. R. Light; Lecturers: E. A. L. Kasan, J. W. Scheuerle; Speech and Hearing Clinician: K. K. Bigelow; Adjunct: S. L. Ainsworth; Courtesy Professors: T. E. Edwards, F. X. Frueh, E. T. Gray; Courtesy Associate Professor: W. W. Wittish; Courtesy Assistant Professor: G. H. Horsfall.

LOWER LEVEL COURSES

CLY 201 SURVEY OF COMMUNICATION DISORDERS (3)
A general survey course concerning the nature and prevention of disorders of communication.

UPPER LEVEL COURSES

CLY 301. INTRODUCTION TO SPEECH PATHOLOGY (6)
The scope of speech pathology as a profession and field of study. An introduction to speech and language disorders (articulation, stuttering, voice, aphasia, etc.): etiologies, major treatment approaches, and research findings.

CLY 302. INTRODUCTION TO AUDIOLOGY (6)
The scope of audiology as a profession and field of study. An introduction to the study of hearing impairments: classifications, etiologies, major treatment approaches, and research findings.

CLY 311. ANATOMY OF THE SPEECH AND HEARING MECHANISM (6)
The neurological and anatomical basis of communication disorders. Comparisons of normal and pathological organic structures and their functional dynamics. Separate sections concentrating on normal and abnormal aural physiology are scheduled for those students with a primary emphasis in audiology.

CLY 312. INTRODUCTION TO RESEARCH PROCEDURES IN COMMUNICOLOGY (6)
Perspective on research in speech pathology and audiology. Introduction to multivariate design considerations as they apply to research, speech and hearing laboratory and clinical settings. Analysis of basic hypothesis testing.

CLY 313. APPLIED PHONOLOGY (6)
An examination of phoneme systems and distinctive features of their allophonic variants with particular emphasis upon those superfixes and suprasegmental modifiers necessary to the understanding and recording of early developmental and deviant speech patterns.

CLY 482. NATURE AND NEEDS OF THE HEARING IMPAIRED (6)
A study of the effects of auditory disorders upon the
organization and expression of behavioral patterns as they relate to motivation, adjustment and personality.

**CLY 483. SELECTED TOPICS** (4)
PR: CI. A reading program of topics in speech pathology and/or audiology conducted under the supervision of a faculty member. May be repeated three times.

**CLY 498. INTRODUCTION TO SPEECH PATHOLOGY AND AUDIOLOGY PRACTICUM** (1-12)
Observation and participation in speech pathology and audiology practicum in the University clinical laboratory.

**FOR SENIORS AND GRADUATE STUDENTS**

**CLY 511. SPEECH PATHOLOGY INSTRUMENTATION** (6)
PR: CI. Calibration, usage and specific applications of specialized instruments available in dealing with speech and language disorders. Includes: recording, sonograph, audiological feedback, video equipment, behavior measuring devices.

**CLY 512. AUDIOLOGY INSTRUMENTATION** (6)
PR: CI. Calibration, usage and specific applications of specialized instruments available in dealing with the identification and measurement of hearing disorders. Includes: sound level recorders, audiometers, and the electrophysiological measurement devices.

**CLY 513. THE SCIENCE OF COMMUNICATION DISORDERS** (6)
PR: CLY 301 or 302 or CI. The application of behavioral and learning principles to the study of the normal development of speech, language and hearing and to the management of disorders.

**CLY 571. EVALUATION OF ORAL COMMUNICATION DISORDERS** (6)
PR: Admittance to the Program or CI. The administration, evaluation, and reporting of diagnostic tests and procedures used in the assessment of speech and language disorders.

**CLY 572. AUDIOLOGY: HEARING SCIENCE** (6)
PR: Admittance to the Program or CI. Introduction to psychoacoustical phenomenon as it relates to the measurement of hearing. Overview of principles and methods of identification audiometry with emphasis on neonatal, preschool, and school age populations. Procedures for determining pure tone thresholds including the application of masking techniques. Fundamental concepts related to hearing aids and their benefits. Management of hearing impaired individuals including counseling.

**CLY 573. AUDIOLOGY: SPEECH AUDIOMETRY** (6)
PR: CLY 572 or CI. Advanced study of psychoacoustical phenomenon as it relates to the measurement of hearing. Instruction emphasizing principles and methods of determining hearing acuity through the use of speech stimuli. Management of clients from pertinent case histories through post-evaluation recommendations. Thorough consideration of hearing aids with special attention on techniques of selecting and fitting aids in a clinical setting.

**CLY 574. METHODS FOR ORAL COMMUNICATION DISORDERS** (6)
PR: CLY 571 or CI. An in-depth analysis of classic and contemporary methods employed in the management of communicatively impaired individuals. Experimental approaches are reviewed through current medical, psychological, speech, language and hearing journals.

**CLY 575. MANAGEMENT OF COMMUNICATION DISORDERS** (4)
PR: CI. The planning of programs for individuals with speech, language, and hearing impairments. Includes administration of programs in public schools, clinics, and private practice.

**CLY 576. COMMUNICATION DISORDERS: VOICE** (4)
PR: CI. A comprehensive study of the medical and physical aspects of voice disorders. Primary emphasis is on therapeutic management.

**CLY 577. COMMUNICATION DISORDERS: ARTICULATION** (4)
PR: CI. An examination of normal and deviant articulatory acquisition and behavior. Presentation of major theoretical orientations and the therapeutic principles based upon them.

**CLY 578. COMMUNICATION DISORDERS: STUTTERING** (4)
PR: CI. A comprehensive study of the diagnosis and modification of stuttering based on a two-factor model. Other major theories are considered and evaluated.

**CLY 579. TECHNIQUES OF AUDITORY TRAINING** (4)
PR: CI. An analysis of theories of auditory reception and amplification. A study of the methods and techniques employed in the development and habilitation of auditory skills for the hearing impaired.

**CLY 580. COMMUNICATION DISORDERS: LANGUAGE** (4)
PR: CI. Examination of research and clinical literature presenting major theoretical orientations pertaining to the etiology, evaluations, and treatment of those factors that hinder or interrupt normal language acquisition or function.

**CLY 581. SUPERVISED RESEARCH** (1-12)
PR: CI. Individualized programs of student research approved and supervised by a faculty member.

**CLY 583. SELECTED TOPICS** (4)
PR: CI. A reading program of topics in speech pathology and/or audiology conducted under the supervision of a faculty member. May be repeated three times.

**CLY 598. SPEECH PATHOLOGY AND AUDIOLOGY PRACTICUM** (1-12)
PR: CI. Participation in speech pathology and audiology practicum in the University clinical laboratory and selected field settings.

**FOR GRADUATE STUDENTS ONLY**

**CLY 620. CLEFT PALATE** (4)
PR: CI. An in-depth study of speech, language and hearing problems associated with cleft lip and cleft palate. Consideration is given to a multidisciplinary approach to therapy and rehabilitation.

**CLY 621. APHASIA** (4)
PR: CI. A consideration of the neurological and psychological aspects of aphasia as they relate to communication disorders. Specific language therapy approaches are discussed and evaluated.

**CLY 622. CEREBRAL PALSY** (4)
PR: CI. A study of the medical, physical, occupational, speech, language, and hearing problems of the cerebral palsied. Therapy techniques are reviewed and evaluated.

**CLY 623. DIALECT AS A COMMUNICATION DISORDER** (4)
PR: CI. Research and clinical literature on dialect as a communication disorder.

**CLY 673. CHILD AUDIOLOGY** (4)

**CLY 674. SPECIAL AUDITORY TESTS** (4)
PR: CLY 573 or CI. History, development, rationale and techniques for administering hearing tests to determine site of lesion, including those requiring special instrumentation. The detection and clinical management of pseudohyposcusis including the use of objective audiometry.

**CLY 675. TECHNIQUES OF SPEECH READING** (4)
PR: CI. Speech reading as a language skill for the deaf and hard of hearing child and adult. Analysis of theories, methods, and systems.
COE 676. HEARING DISORDERS (4)
PR: CLY 674 or CI. The compilation and interpretation of hearing test data for diagnosing hearing impairment. Investigation of medical and surgical techniques for the treatment of hearing loss, coordinating information for planning the treatment and rehabilitation of the hearing impaired, including the involvement of other professionals.

COE 677. HEARING CONSERVATION (4)
PR: CLY 573 or CI. A comprehensive study of all aspects of hearing conservation, especially those relating to the detection and prevention of hearing loss in both children and adult populations. Special attention is given to problems encountered by industry.

COE 680. RESEARCH PROCEDURES IN SPEECH PATHOLOGY AND AUDILOGY (4)
PR: CI. Advanced research and experimental design techniques employed in clinical and laboratory settings in speech pathology and audiology. Introduction to research technologies; review of stylistic considerations in research writing.

COE 681. DIRECTED RESEARCH. (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

COOPERATIVE EDUCATION (COE)

Coordinating Staff: G. F. Lentz, G. R. Card, D. A. Haney, P. D. Jackson, J. E. Lewis

COE 171. COOPERATIVE EDUCATION, 1ST TRAINING PERIOD (0)
PR: 45 hours of academic credit, acceptance in Cooperative Education Program (S/U only.)

COE 172. COOPERATIVE EDUCATION, 2ND TRAINING PERIOD (0)
PR: COE 171. (S/U only.)

COE 271. COOPERATIVE EDUCATION, 3RD TRAINING PERIOD (0)
PR: COE 172. (S/U only.)

COE 272. COOPERATIVE EDUCATION, 4TH TRAINING PERIOD (0)
PR: COE 271. (S/U only.)

COE 371. COOPERATIVE EDUCATION, 5TH TRAINING PERIOD (0)
PR: COE 272. (S/U only.)

COE 372. COOPERATIVE EDUCATION, 6TH TRAINING PERIOD (0)
PR: COE 371. (S/U only.)

COE 471. COOPERATIVE EDUCATION, 7TH TRAINING PERIOD (0)
PR: COE 372. (S/U only.)

COE 472. COOPERATIVE EDUCATION, 8TH TRAINING PERIOD (0)
PR: COE 471. (S/U only.)

COE 571. COOPERATIVE EDUCATION, 9TH TRAINING PERIOD (0)
PR: COE 472. (S/U only.)

COE 572. COOPERATIVE EDUCATION, 10TH TRAINING PERIOD (0)
PR: COE 571. (S/U only.)

CRIMINAL JUSTICE (CJP)

Director: M. Silverman; Professor: H. Vetter; Associate Professors: W. R. Blount, M. C. Derike, J. T. Reilly, M. Silverman, L. Terriio, M. Vega; Assistant Professors: H. Harper, I. J. Silverman; Instructor: D. Agresti; Interim Lecturer: S. Oster; Visiting Assistant Professor: V. McAllister

LOWER LEVEL COURSES

CJP 200. MAN, CRIME, AND SOCIETY (4)
Designed to give the undergraduate non-major a non-technical survey of the American criminal justice system. The nature of crime, law enforcement, the court system, and correctional practices and institutions will be covered. Not for major credit.

UPPER LEVEL COURSES

CJP 300. SURVEY OF CRIMINAL JUSTICE SYSTEM (5)
PR: PSY 200, SOC 201, or equivalent or CI. An introduction to the major institutions associated with criminal justice, their structure, personnel, objectives, resources, and operation. Course content also includes developing an understanding of criminal law, terminology and procedure. This course is designed to provide a broad overview of the activities, language, concepts and career opportunities of the entire Criminal Justice System. The course may include an exploratory project, encouraging the student to use his or her own initiative to explore, observe and interview in one or more local institutions of criminal justice. (Formerly CJP 201.)

CJP 301. NATURE OF CRIME (4)
PR: CJP 300. This course is designed to provide a basic understanding of the complex factors related to crime in America. Focus will be centered on reviewing the basic issues, scope, and costs stemming from criminal activities.

CJP 302. LEGAL FOUNDATIONS OF CRIMINAL JUSTICE (4)
PR: CJP 300, POL 200 or CI. Content of this course examines the effects upon the criminal justice system of the freedoms of habeas corpus, bills of attanders and ex post facto. Thereupon, the course follows the accused through the paths of criminal justice from arrest, to pretrial procedures, to the court and ultimately through corrections.

CJP 315. CHARACTERISTICS OF THE OFFENDER (4)
PR: Junior standing plus CJP 301 or CI. A four-course series focusing on those individuals being processed through the criminal justice system. Each course will examine the characteristics of a special offender group, its impact on the system, and the system's potential to change this class of offender behavior patterns. (May be taken with different subject matter up to 16 hours.)
CJP 410. THEORY AND PRACTICE OF LAW ENFORCEMENT (4)
PR: Junior standing plus CJP 302 or CI. Designed to provide an in-depth summary of current philosophies and techniques used in the field of law enforcement with special attention given to the roles of law enforcement officers. Attention will be given to the new experimental programs and techniques.

CJP 412. THE LAW ENFORCEMENT OFFICER AND THE COMMUNITY (4)
PR: Junior standing plus CJP 410, or CI. This course examines the area of human relations especially as it applies to police functions within the community. Topics of prejudice and discrimination are emphasized.

CJP 420. THEORY AND PRACTICE OF CORRECTIONS (4)
PR: Junior standing plus CJP 301 or CI. The scope of this course relates to the analysis of the different treatment philosophies and techniques currently in use in the field. Attention will be given to experimental and demonstration programs as well as to generally accepted and established methods.

CJP 421. JUVENILE CORRECTIONS (5)
PR: Junior standing plus CJP 420, or CI. Provides an in-depth analysis of the different treatment philosophies and techniques used in the field of juvenile corrections today. Special attention is given to experimental and demonstration programs as well as to traditional and established methods. Students will be required to work in a juvenile corrections agency and to attend field trips.

CJP 422. THE PROBATION AND PAROLE PROCESS (5)
PR: Junior standing plus CJP 420, or CI. The concepts of probation and parole will be thoroughly explored and related to actual and potential treatment situations.

CJP 425. INDIVIDUAL AND GROUP PROCESSES IN CORRECTIONAL TREATMENT I (3)
PR: Senior standing, PSY 200, CJP 421. Designed to introduce the student to theories and methods underlying treatment modalities currently employed in corrections.

CJP 426. INDIVIDUAL AND GROUP PROCESSES IN CORRECTIONAL TREATMENT II (3)
PR: Senior standing plus CJP 425. The student will be introduced to practical applications within a correctional setting involving both individual and group situations.

CJP 480. RESEARCH METHODS IN CRIMINAL JUSTICE (4)
PR: Junior standing plus CJP 300, or CI. Designed to give the criminal justice major an introduction to research methodology and the evaluation of research. This course may not be taken for credit if the student has already successfully completed SSI 311, Social Science Statistics, ECN 231, Business and Economic Statistics I, or MTH 345, Introductory Statistics I.

CJP 481. DIRECTED RESEARCH (1-5)
PR: CI. This course is designed to provide students with a research experience in which they will work closely with faculty on the development and implementation of research projects in the area of criminal justice.

CJP 485. DIRECTED READINGS (1-5)
PR: CI. This course is specifically designed to enable advanced students the opportunity to do in-depth independent work in the area of criminal justice. Each student will be under the close supervision of a faculty member of the program.

NOTE: CJP 481 & CJP 485. (a) Students wishing to enroll must make arrangements with a faculty member during the quarter prior to actually taking the course, (b) a minimum of four (4) CJP courses must have been completed satisfactorily prior to enrollment, (c) first consideration will be given to CJP majors, and (d) individual faculty members may add additional requirements at their discretion.

CJP 491. SEMINAR IN CRIMINAL JUSTICE (3)
PR: Senior standing and CI. The seminar (multi-course series — variable topics) will consider the various changes occurring in the field of criminal justice with added emphasis placed on the responsibilities of careers in the field. (May be taken with different subject matter up to 12 hours.)

CJP 499. INTERNSHIP FOR CRIMINAL JUSTICE MAJORS (3-12)
PR: Senior standing. The internship will consist of placement with one or more of the agencies comprising the criminal justice system. This course will enable the students to gain meaningful field experience related to their future careers. Each three-hour block of credit will require a minimum of ten hours of work per week within the host agency in addition to any written work or reading assignments. (S/U only.)

FOR GRADUATE STUDENTS ONLY

CJP 601. THEORIES OF DEVIANCY (4)
An introduction and comparison of major historical and contemporary theories as they relate to the explanation of criminal behavior. Attention will be given to developing, on the part of the student, a frame-of-reference by which he can organize and understand the empirical factors operating in the Criminal Justice System.

CJP 602. INTRODUCTION TO RESEARCH AND EVALUATION IN CRIMINAL JUSTICE (4)
An introduction to research, evaluation, statistics, data management and management information procedures. Emphasis will be given to the role of each of these topics as monitors and change agents in criminal justice, particularly in police management and corrections.

CJP 603. LAW AND CRIMINAL JUSTICE (4)
An exposition of historical and contemporary legal principles, procedures and issues as reflected in Constitutional provisions, statutes and case law.

CJP 610. COMMUNITY CORRECTIONAL ADMINISTRATION (3)
This course consists of an analysis of the complex issues and controversies related to the development and management of modern community-based corrections programs. May be repeated up to 9 hours.

CJP 611. CORRECTIONAL TREATMENT METHODS (3)
Designed to acquaint the beginning graduate student with general conditions, skills and techniques required in order to provide satisfactory treatment for both adult and juvenile offenders. Emphasis will be placed on familiarizing the student with those factors and conditions which facilitate treatment and the goals of treatment in a community correctional setting. In addition, several specific and widely used treatment approaches will be extensively covered and practiced during this course. May be repeated up to 9 hours.

CJP 612. CORRECTIONAL PLANNING (3)
This course will provide the student with an in-depth examination of urban correctional planning processes. Topics included will deal with the development of personnel, budgets, and facility plans and their implementation. May be repeated up to 9 hours.

CJP 613. SEMINAR IN COMMUNITY CORRECTIONS (3)
This course will provide a mechanism by which staff and students can focus on the latest events, issues, and problems confronting community corrections programming. May be repeated up to 6 hours.

CJP 620. POLICE ADMINISTRATION (3)
This course is designed to cover the major elements of urban police administration including personnel selection and promotion, program development, and management techniques. May be repeated up to 9 hours.

CJP 621. URBAN POLICE PROBLEMS (3)
This course addresses itself to the major problems confronting urban police departments. Areas of concentration will be
racial tensions; police corruption, politicalization, etc. May be repeated up to 9 hours.

CJP 622. URBAN POLICE PLANNING (3)
This course will examine contemporary law enforcement planning and will focus on techniques and skills required to forecast future needs of police agencies in rapidly expanding metropolitan areas. May be repeated up to 9 hours.

CJP 623. SEMINAR IN URBAN LAW ENFORCEMENT (3)
Designed to provide an in-depth review of contemporary issues and problems as they relate to urban police administration. May be repeated up to 9 hours.

CJP 630. RESEARCH AND EVALUATION METHODS (3)
A detailed coverage of statistical research and evaluation techniques utilized for research and reporting practices in Criminal Justice. Data management, field experimentation and research methodology will be included as they apply. May be repeated up to 6 hours.

CJP 631. SYSTEMS ANALYSIS IN CRIMINAL JUSTICE (3)
Time will be spent on the design and analysis of both existing and student created systems, with emphasis on the role of system analysis as it applies to management information systems, computer based systems. In addition, attention will be directed to retrieval strategies, reducing work loads, simplification, formatting, form design and control, data organization costs. May be repeated up to 6 hours.

CJP 632. RESOURCE DEVELOPMENT AND ACQUISITION (3)
Required for Planning and Evaluation tract students, optional for others, this course will survey organizations which provide financial assistance to Criminal Justice agencies. In all cases, an analysis of criteria, limitations and availability will be made. Practical experience in proposal planning and submission will be provided.

CJP 660. GRADUATE PRACTICUM IN CRIMINAL JUSTICE* (1-4)
Practicum will consist of placement with a criminal justice agency selected by the student in consultation with his committee. This placement will enable the student to gain high level field experience related to their chosen career field. A minimum of 24 graduate hours in Criminal Justice must be completed prior to enrollment. (S/U only.) (Formerly CJP 681.)

CJP 681. DIRECTED RESEARCH. (credit varies)
PR: GR. Master’s level. Repeatable. (S/U only.)

CJP 690. TOPICS IN CRIMINAL JUSTICE (3)
PR: Graduate standing in the Criminal Justice Program. The field of criminal justice is characterized by a wide variety of issues and controversies that are of topical concern. This seminar provides a forum for analyzing and discussing these topics as their importance and the accumulation of data warrants. Classics in the criminal justice literature may be included among the topics for treatment in this course.

CJP 691. CRIMINAL JUSTICE INTERNSHIP* (12)
The internship will place the student in a criminal justice position commensurate with his skills so that he may be able to blend theory with experience. Placement, which will be fulltime for one year, will be worked out between the agency, the student, and the student’s committee. All graduate academic course work must be completed prior to enrollment. (S/U only.)

CJP 693. PRO SEMINAR IN CRIMINAL JUSTICE (1)
One hour is required for all students. This variable topic listing is a forum primarily for the presentation and discussion of ethical and research ideas by faculty, guests, and students to aid students in linking theory and research, in understanding contemporary, problem oriented research, and in developing thesis subjects. Any issue of professional concern may be treated. May be repeated up to 5 hours.

CJP 699. THESIS: MASTER’S (credit varies)
Repeatable. (S/U only.)

DANCE (DAN)

Chairperson: W. G. Hug; Professor: W. G. Hug; Associate Professor: C. Robinson; Assistant Professors: R. Sias, M. Starbuck.

LOWER LEVEL COURSES

DAN 201. BEGINNING MODERN (3)
PR: Admission by audition. Study of basic principles of modern dance technique. Practical work in beginning exercises and movement phrases, utilizing changing rhythms and dynamics. May be repeated.

DAN 202. BEGINNING BALLET (3)
PR: Admission by audition. Basic positions and fundamental barre exercises. Stress on correct alignment of the body and the application of simple step combinations in centre work. The use of ballet vocabulary (French terms). Material is covered almost totally as practical work in class with a few outside projects. Concert and performance attendance required. May be repeated.

DAN 203. CHOREOGRAPHY I (3)
Study and execution of basic principles of improvising. Preparation of studies in theme and variations, breath phrases and metric phrases. May be repeated.

UPPER LEVEL COURSES

DAN 301. INTERMEDIATE MODERN (4)
PR: Admission by audition. Continuation of DAN 201. Further emphasis on style and phrasing. Work in projecting mood and quality by dancing and rehearsing in more advanced student choreography, leading to performance. Rehearsal hours to be arranged. May be repeated.

DAN 302. INTERMEDIATE BALLET (4)
PR: Admission by audition. Continuation of DAN 202. Intensification of barre exercises for the development of strength and form. Centre exercises to develop quickness of mind/body coordination. Most of the ballet steps are introduced. Application of phrasing and quality of movement. Adagio, pirouettes, and allegro are specifically stressed. Material covered as practical work in class with concerts and performances. Rehearsal hours to be arranged. May be repeated.

DAN 303. CHOREOGRAPHY II (3)
PR: DAN 201 or CI. Preparation of studies in rhythm, dynamics, form and motivation, culminating in a solo. May be repeated.

DAN 304. JAZZ DANCE (2)
PR: DAN 301 or DAN 302 or CI. A technique class with an emphasis on highly stylized, percussive movement on a strong rhythmic base. Required is the performance of a short dance sequence encompassing these skills. May be repeated.

DAN 305. MUSIC FOR DANCE (3)
Development of practical music skills in relation to dance. Emphasis on rhythm and the relationship of music forms to dance. May be repeated up to 6 credit hours.

DAN 311. REPERTORY (1)
The development and performance of solo and/or group **Practicum is required of all students who are not selected for or who choose not to participate in the alternative one-year internship. To be completed during the second year in the program.**
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<td>DAN 370</td>
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<td>DAN 371</td>
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<td>DAN 401</td>
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<td>DMA 002</td>
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**DEVELOPMENTAL COURSES**

**ECN 100. CONTEMPORARY ECONOMIC PROBLEMS**

An introduction to economics in the context of contemporary social issues. The problem of economic scarcity, the role of ethical values in economics, economic processes and the economic analysis of social issues.

**ECN 201. ECONOMIC PRINCIPLES I: MICROECONOMICS**

The fundamental economic concept of scarcity, alternative courses of action and the problem of choice. How an economy decides what to produce, how to produce and how to reward participants in the economy. Attention is focused on factors affecting consumer wants and on the behavior of price in different types of markets.
ECN 202. ECONOMIC PRINCIPLES II; MACROECONOMICS
(4)
An introduction to the modern theory of income determination with emphasis upon the application of monetary and fiscal policy oriented toward the accomplishment of the macroeconomic objectives of full employment, economic growth, and balance of payments stability.

ECN 231. BUSINESS AND ECONOMIC STATISTICS I
(3)
PR: MTH 211. College Algebra or equivalent. Description of sample data; calculation of probabilities; frequency functions of random variables; the binomial and normal distributions; sampling theory and estimation; tests of hypotheses; elements of Bayesian decision theory.

UPPER LEVEL COURSES
ECN 301. INTERMEDIATE PRICE THEORY
(5)
PR: ECN 201-202. Advanced analysis of supply and demand as related to competition and monopoly; application of economic theory to product pricing and resource pricing.

ECN 305. MANAGERIAL ECONOMICS
(5)
PR: ECN 201, 202. Analysis of the concepts and tools of microeconomic analysis for decision-makers in business. Emphasizes demand and production analysis, decision-making within the different market structures of the American Economy. Stresses applications. Recommended for non-majors.

ECN 306. BUSINESS FLUCTUATION AND ECONOMIC FORECASTING
(5)
PR: ECN 201, 202, ECN 331. Introduction to business cycles and forecasting business fluctuations. Forecasting techniques for GNP and GNP components developed and appraised. Use and implications of macroeconomic forecasting and business.

ECN 311. LABOR ECONOMICS
(4)
PR: CI. History of the trade union movement; economic analysis of trade union philosophies and practices; examination of basic influences affecting labor force, real wages and employment; collective bargaining and labor law.

ECN 323. INTERMEDIATE INCOME AND MONETARY ANALYSIS
(5)
PR: ECN 201-202. An advanced exposition of the neo-Keynesian analysis explaining the determination of income, employment, prices, and the interest rate. Emphasis is placed upon the interaction of aggregate demand, as determined by consumption, investment, money, and the government budget, and aggregate supply.

ECN 331. BUSINESS AND ECONOMIC STATISTICS II
(5)
PR: MTH 211. College Algebra or equivalent and ECN 231. Theory and use of statistical inference for decision and prediction. Point and interval estimation; criteria for choosing estimators and decision rules; hypotheses tests and prob values; analysis of variance; correlation and regression.

ECN 341. ECONOMICS OF TRANSPORTATION
(4)
Functions of transportation agencies, rate structure of transportation companies, problems of state and federal regulations and coordination of transportation facilities.

ECN 343. ECONOMICS OF PUBLIC UTILITIES
(4)

ECN 351. INTERNATIONAL ECONOMICS
(4)

ECN 371. AMERICAN ECONOMIC HISTORY
(4)
The growth and evolution of American economic institutions from Colonial times to the present.

ECN 373. ECONOMICS OF THE URBAN ENVIRONMENT
(5)
PR: CI. Economic analysis of the phenomena of cities as well as urban social problems including poverty, discrimination, housing, transportation, pollution, crime and fiscal considerations.

ECN 401. HISTORY OF ECONOMIC THOUGHT
(5)
PR: ECN 201-202, 301, or CI. The development of the economic schools (Scholasticism, Mercantilism, Physiocracy, Classicism, Utopian Socialism, Anarchism, Marxism, Historicalism, Marginalism, Neo-Classicism, Institutionalism, and Keynesianism) in connection with their philosophical and political convictions in relation to their times.

ECN 404. INTRODUCTION TO MATHEMATICAL ECONOMICS
(4)
PR: MTH 212, ECN 201-202 and ECN 331 or CI. Economic processes expressed as equations and economic systems as mathematical models. Investigation of their static and dynamic properties by mathematical analysis and computer simulation. (Formerly ECN 361.)

ECN 405. COMPARATIVE ECONOMIC SYSTEMS
(4)
Analysis of the major types of economies in industrially developed countries: competitive capitalism (e.g.; West Germany), regulated capitalism (e.g.; France), "command" communism (e.g.; the Soviet Union) and "worker-controlled" communism (e.g.; Yugoslavia). Each is subject to economic evaluation with particular reference to their ability to meet changing consumer demands and technological innovations.

ECN 410. COLLECTIVE BARGAINING
(5)
PR: ECN 311. The administration of labor-management arguments, mediation and arbitration of industrial disputes and governmental role in collective bargaining. (Formerly ECN 313.)

ECN 411. LABOR RELATIONS AND PUBLIC POLICY
(4)
PR: ECN 311. Problems resulting from legislative and judicial interpretation of the rights, duties and responsibilities of labor unions and employers; public policy in labor-management negotiations; survey of legislation designed to protect workers.

ECN 423. PUBLIC FINANCE
(5)
PR: ECN 301, 323. An examination of the public sector and its contribution to economic welfare. Government expenditures and revenues are examined in relation to their impact on resource allocation, income distribution, stabilization, and economic growth.

ECN 425. MONETARY THEORY
(5)
PR: ECN 301, 323. An examination of the impact of the financial sector upon real economic magnitudes. The course approaches its subject matter through the theory of portfolio and capital adjustments with emphasis upon the contributions of Pigou, Fisher, Keynes, Patinkin, Friedman, and Tobin.

ECN 431. SELECTED TOPICS IN QUANTITATIVE ECONOMICS
(4)
PR: MTH 212, ECN 331 or CI. Analysis of relevant problems of economic policies, and dynamics of economic growth in emerging nations. The benefits and relevance of the theory of economic development is examined.
within the context of the social and political milieu of today's underdeveloped areas.

ECN 471. THEORY OF ECONOMIC DYNAMICS (4)
PR: ECN 323. An examination of macroeconomic processes as they occur through time. The determination and characteristics of long run growth paths based upon both Keynesian and Neoclassical models are discussed and business cycles are then treated as short run deviations from these growth paths. Empirical studies, forecasting, and policy issues are also considered.

ECN 481. INDEPENDENT RESEARCH OR DIRECTED READINGS (1-5)
PR: CI. Individual Study Contract with Instructor and Department Chairman required. The content of the course will be mutually determined by the student and Instructor. Course may be repeated up to 10 hours.

ECN 483. SELECTED TOPICS IN ECONOMICS (1-5)
PR: Senior standing and CI. Topics to be selected by the instructor or instructors on pertinent economic issues. (Formerly ECN 489.)

FOR SENIORS AND GRADUATE STUDENTS

ECN 501. MICROECONOMICS (3)
An accelerated introduction to the price system as a mechanism for allocating scarce resources. Models are developed to explain the workings of both product and resource markets. This course is intended for students with no previous courses in economics and no credit towards degrees will be received in the graduate programs of the College of Business.

ECN 502. MACROECONOMICS (3)
PR: 501. An accelerated introduction to the understanding of the post-Keynesian system through the development of a theoretical supply and demand model and the application of this model to the fiscal and monetary possibilities inherent within it. This course is intended for students with no previous study in economics and no credit towards degrees will be received in the graduate programs of the College of Business.

ECN 503. STATISTICS FOR BUSINESS (3)
PR: ECN 231 and College Algebra. Statistical inference and decision theory applied to problems of business management.

ECN 507. ECONOMIC EDUCATION I (3)
This course deals with economic processes affecting price determination, income distribution, national income and employment, growth, price levels, and balance of payments. This course is essentially designed for in-service teaching personnel.

ECN 508. ECONOMIC EDUCATION II (3)
Basic economic processes affecting price determination, income distribution, national income and employment, growth, price levels, and balance of payments. This course is essentially designed for in-service teaching personnel.

ECN 509. ECONOMICS EDUCATION III (3)
This course will be concerned with current economic problems. Emphasis will be placed on an analysis of those topical problems which secondary social science teachers would find particularly important to include in their courses. This course is essentially designed for in-service teaching personnel.

ECN 519. INDUSTRIAL ORGANIZATION I—STRUCTURE (4)
PR: ECN 201 and 202, or equivalent. Extent, level, trends and dimensions of economic concentration; competitive conduct of large enterprises; causal factors underlying changes in industrial structure; technology, managerial economies and diseconomies, invention and innovation, and mergers.

ECN 520. INDUSTRIAL ORGANIZATION II—CONDUCT AND BEHAVIOR (4)
PR: ECN 301 and ECN 519. Non-price competition, predatory practices, government intervention; oligopolistic pricing; differences from competitive pricing, standards of, constraints upon, effects on income distribution, production and governmental policy.

ECN 531. ECONOMIC PROGRAMMING AND CONTROL (5)

ECN 561. ECONOMETRICS (5)
PR: ECN 301, 323, 331, or CI. Theory and use of multiple regression to explain, forecast and influence economic behavior. Applications to demand, cost and production functions. Model specification. Ordinary least squares and instrumental variables methods. Analysis of errors. BMD and TSP computer programs. Design and conduct of individual empirical research projects.

ECN 573. URBAN ECONOMICS (4)
PR: ECN 201-202 or ECN 501-502. The economics of urban areas including analysis of their growth and development as well as intra-urban location patterns. Economic analysis at an advanced level of urban social problems.

FOR GRADUATE STUDENTS ONLY

ECN 601. RESEARCH METHODOLOGY (3)

ECN 602. HISTORY OF ECONOMIC THOUGHT (5)
PR: ECN 605 and ECN 607. An intense analysis of the main currents of modern economic thought during the last one hundred years.

ECN 603. MANAGERIAL STATISTICS (3)

ECN 604. APPLIED FORECASTING (3)

ECN 605. MICRO-ECONOMICS (3)
PR: ECN 201-202 or ECN 501-502. An intensive study of microeconomics examining the behavior of consumers, and producers. Topics covered include the general concept of scarcity and conceptual models in the areas of demand, production, cost, and the firm and market organization. Advanced readings in theoretical and applied microeconomics will be emphasized.

ECN 607. AGGREGATE ECONOMICS (3)
PR: ECN 201-202 or ECN 501-502. An analysis of the macroeconomic interrelationships determining the level of income, employment, prices and interest rates over time and the impact of government policy upon these variables.

ECN 608. APPLIED ECONOMIC ANALYSIS (3)
PR: ECN 605, 607. Application of micro and macro economic analysis to problems of policy and procedure in business and government.

ECN 610. MANPOWER ECONOMICS SEMINAR (5)
PR: ECN 201-202, 501-502, or CI. This course is designed to provide the student with a background in labor force statistics, labor institutions, and problems of employment and un-
employment. This background then allows for further study of the causes and remedies for unemployment and underemployment.

ECN 611. ADVANCED MANAGERIAL ECONOMICS (3)
PR: ECN 201-202 or 501-502, GBA 503 or equivalent. Advanced study of decision-making in households, firms and not-for-profit institutions. Topics cover demand, production and cost, organizational goals, efficiency vs. effectiveness, environmental influences on decision-making. Both problems of analysis and measurement are emphasized.

ECN 612. ADVANCED BUSINESS FLUCTUATION AND ECONOMIC FORECASTING (3)
PR: ECN 201-202 or ECN 501-502, GBA 605. May be waived by instructor. Applications of statistical techniques to forecasting aggregate business activity, GNP and GNP components. Critical analysis of forecasting techniques and applications of forecasting methods to business decisions.

ECN 614. LABOR RELATIONS LAW (3)
A survey of the various legal constraints applicable to the employer-employee relationship. Included are such areas as collective bargaining, civil rights, and fair labor standards. (Also offered as MAN 614.)

ECN 625. PUBLIC FINANCE I (4)
PR: ECN 201-202 or 501-502 or equivalent. An examination of the role of the public sector and its contribution to economic welfare. Tax and expenditure policies are examined in relation to their effects on resource allocation and income distribution.

ECN 624. PUBLIC FINANCE II (4)
PR: ECN 623. Topics in public economics including cost functions for public goods, redistributive techniques, fiscal federalism, major issues in government expenditures, environmental policies, stabilization, growth and debt policy.

ECN 625. MONETARY THEORY (5)
PR: ECN 605, 607. Advanced discussion of the impact of the financial sector upon real economic magnitudes. The course emphasizes theoretical and empirical contributions found in the current literature as an extension of earlier work done in the field on monetary theory.

ECN 681. DIRECTED RESEARCH. (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

ECN 683. SELECTED TOPICS IN ECONOMICS (1-6)
PR: Graduate standing and CC. The course content will depend on student demand and instructor's interest.

ECN 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

EDUCATION

Art Education (EDA)

EADA 308. EXPERIENTIAL BASIS IN ART EDUCATION (4)
PR: Admission to College of Education. Designed to help the individual student discover and develop meanings and values in art and education with emphasis on communicative skills, both verbal and visual. Focus will be on the individual and potential alternatives in the teaching of art. (Formerly EDA 377.)

EADA 310. ART TEACHING STRATEGY AND MEDIA WORKSHOP I (5)
PR: Admission to College of Education and EDA 308. A combination of theory, philosophy and practice in both public and private learning centers to provide the student with a variety of teaching concepts and media exploration in art education and to further enable the student to understand stages of young people, three to eighteen. (Formerly EDA 379.)

EADA 408. SEMINAR IN ART EDUCATION ADMINISTRATION (2)
PR: Admission to College of Education and EDA 308. The concepts and areas of skill essential to successful practice in art education management. To include understanding of how art programs are funded, art facility planning, art curriculum development, art exhibition techniques, public relations promotion and supply and equipment requirements.

EADA 410. URBAN ENVIRONMENT ARTS WORKSHOP (5)
PR: Admission to College of Education and EDA 308. Identification, exploration, and experimentation with unique urban spaces and populations as potential new environments for teaching and learning in the arts.

EADA 412. ART TEACHING STRATEGIES AND MEDIA WORKSHOP II (5)
PR: Admission to College of Education and EDA 308. Media and the learning process as a means of self-expression will be explored. Media experience in sound exploration, visual exploration through photographic arts, cinematography and video-television systems. Exploration of local business and industrial technology for developing experimental media forms. Designing of teaching strategies for creative media experiences as well as skills in media criticism to include
application at elementary and secondary levels. (Formerly EDA 441.)

**EDA 450. CRAFTS WORKSHOP IN ART EDUCATION (4)**
PR: Admission to College of Education and EDA 308. The study of processes and media involved in the expression of individual ideas through crafts. Emphasis placed on crafts in a contemporary society with skills in metals, weaving, fibers, and ceramics and their application in a public school curriculum.

**EDA 452. ART MEDIA FOR CHILDREN (5)**
PR: EDE 421 or EDA 308. An in-depth study of arts and craft media for children. Emphasis will be placed on innovative use of new materials. (Formerly EDA 521.)

**EDA 455. EXPERIMENTAL FILMMAKING FOR CHILDREN (5)**
PR: EDA 308 or EDE 421 or EDE 435 (suggested: COM 550). A study of basic experimental film techniques and laboratory experiences with children in the public schools, community centers and non-school arts programs. (Formerly EDA 531.)

**FOR GRADUATE STUDENTS ONLY**

**EDA 660. HISTORICAL AND PHILOSOPHICAL FOUNDATION OF ART EDUCATION (4)**
Past and contemporary philosophies and practices in art education.

**EDA 661. ADMINISTRATION AND SUPERVISION OF ART EDUCATION (4)**
Principles of administration and supervision of art programs in the school.

**EDA 682. RESEARCH SEMINAR IN ART PROGRAM (4)**
PR: EDA 660 or Cl. Literature and research in art education. Various approaches to problem solving and evaluation with emphasis on individual research.

**EDA 698. FIELD WORK IN ART EDUCATION (2-6)**
For students with degree-seeking status. Supervised participation in activities related to art education in community centers, non-school arts programs, planned workshop and research.

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**Curriculum (EDC)**

**LOWER LEVEL COURSES**

**EDC 101. INTRODUCTION TO TEACHING (4)**
PR: Freshman only or Cl. The people with whom teachers work, the types of tasks they perform and the challenges they can anticipate. Observation of teaching at several grade levels. (S/U only.)

**UPPER LEVEL COURSES**

**EDC 401. CURRICULUM AND INSTRUCTION (5)**
PR: EDF 305 and 307, and admission to a teacher education program. Structure and purposes of curriculum organization with special emphasis on the quality of curriculum. Students enrolled in EDC 401 are required to spend six hours a week in public schools as pre-interns in addition to regular class hours.

**EDC 400. DIRECTED STUDY (1-4)**
PR: Senior standing. To extend competency in teaching field. Offered only as a scheduled class.

**EDC 481. INDIVIDUAL RESEARCH (1-4)**
PR: Senior standing and consent of program coordinator.

**EDC 485. DIRECTED READINGS (1-4)**
May be repeated for a total of 4 quarter hours.

**EDC 498. SENIOR SEMINAR IN EDUCATION (3)**
PR: Senior standing. Synthesis of teacher candidate’s courses in his complete college program. Required concurrently with internship.

**EDC 499. INTERNSHIP (1-12)**
One full quarter of internship in a public or private school. Intern takes Senior Seminar in Education concurrently. In special programs where the intern experience is distributed over two or more quarters, students will be registered for credit which accumulates to 12 quarter hours. (S/U only.)

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**FOR SENIORS AND GRADUATE STUDENTS**

**EDC 501. CURRICULUM AND INSTRUCTION: ELEMENTARY OR SECONDARY (5)**
Curriculum scope, sequence and interrelationships, with a critical evaluation of current trends.

**EDC 510. HEALTH PROBLEMS IN CHILDREN (4)**
Health problems prevalent in the culturally disadvantaged child and the teacher’s role in referral or educational adaptation in classroom activities.

**EDC 552. CREATIVE PROBLEM SOLVING FOR THE CHILD (4)**
Exploration of the concept of creativity, its factors, measurement, and application to education. Opportunities are given to work with children in a laboratory setting and to prepare materials to be used with small groups of children.

**EDC 557. CURRICULUM PLANNING AND DEVELOPMENT IN SECONDARY ENGLISH (4)**
PR: Certification in English or Mass Communications. Examination of new curricular policies and procedures relating to the teaching of English in the secondary school.

**EDC 559. CURRICULUM EVALUATION IN SECONDARY ENGLISH (4)**
PR: Certification in English or Mass Communications. Examination of new evaluation policies and procedures relating to curricula in English in the secondary school.

**EDC 585. EDUCATION WORKSHOP (1-5)**
Professional in-service workshop in various areas of education. May be repeated when subjects differ. Not normally used in degree programs. (S/U only.)

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**FOR GRADUATE STUDENTS ONLY**

**EDC 601. THEORETICAL ISSUES IN CURRICULUM AND INSTRUCTION (4)**
PR: 8 quarter hours at the graduate level in the Foundations areas. Open only to degree-seeking graduate students. Advanced study of basic concepts and their practical application. Persistent issues and problems and development of rationale for their examination.

**EDC 661. PRINCIPLES OF EDUCATIONAL SUPERVISION (5)**
PR: Courses in general curriculum. Instructional leadership with emphasis on organization for curriculum improvement and in-service growth for professional school personnel.

**EDC 671. PRINCIPLES OF EDUCATIONAL ADMINISTRATION (5)**
Educational administration as a profession. Consideration is given to organization control, and support of the educational system.

**EDC 673. SCHOOL LAW (4)**
Basic essentials of school law, a review of court decisions affecting American education, with emphasis upon the study of Florida State Statutes as they pertain to the question of Florida public schools.

**EDC 674. CASE STUDIES IN SCHOOL ADMINISTRATION (4)**
PR: Consent of the program and/or EDC 671. Case studies presented are designed to help prospective administrators think through various administrative problems, identify feasible solutions, and critically examine the decisions that are made. The skill of decision making is an integral focus of the course.

**EDC 675. SCHOOL FINANCE (4)**
PR: Principles of Educational Administration of Cl. A study of the support of public education programs through local, state, and federal sources; principles guiding the distribution of funds for equal educational opportunity; methods of budget
preparation and administration; and projecting future funding requirements.

EDC 677. PLANNING EDUCATIONAL FACILITIES (4)
PR: CI. Study of problems in the planning, construction, and utilization of educational facilities. Visitation and/or evaluation of selected school plants.

EDC 678. PROBLEMS IN SUPERVISION: SECONDARY (4)
PR: Consent of the program and/or EDC 661. The analysis of instructional problems in schools. Emphasis of the course is directed to supervisory tasks, case studies, and the application of problem solving techniques and strategies.

EDC 679. ADMINISTRATIVE ANALYSIS AND CHANGE (4)
A competency based course on the application of function analysis, the Critical Incident technique and the Delphi technique to the identification, assignment, and evaluation of administrative tasks within selected organizational settings.

EDC 680. ADMINISTRATION PRACTICUM (4-10)
PR: Completion of a significant amount of the student's program. Field experiences in school systems for the purpose of identifying and analyzing educational problems. Application of concepts developed in the student's program to the solution of these problems. (Formerly EDC 695.)

EDC 681. DIRECTED RESEARCH (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

EDC 683. SELECTED TOPICS IN EDUCATION (1-5)
PR: Graduate Standing and CI. Each topic is a course under the supervision of a faculty member. The title and content will vary according to the topic.

EDC 685. SCHOOL CURRICULUM IMPROVEMENT (4)
Workshop for the improvement of the curriculum of an elementary or secondary school. Open only to teachers in service. Complete faculty participation required.

EDC 689. SUBJECT SPECIALIZATION PLANNING SECONDARY (4)
Individually planned course in a secondary school subject area for in-service teachers.

EDC 691. INTERNSHIP (1-9)
PR: CI. Open to graduate degree candidates only. Supervised teaching at the secondary or junior college level as appropriate. (S/U only.)

EDC 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

EDC 781. DIRECTED RESEARCH (credit varies)
PR: GR. Ph.D. level. Repeatable. (S/U only.)

EDC 783. SELECTED TOPICS (1-5)
PR: CC. Selected topics in advanced Education. May be repeated for credit to a maximum of 15 hours.

EDC 791. GRADUATE SEMINAR (1-5)
PR: CC. Seminar in advanced Education. May be repeated for credit to a maximum of 15 hours.

EDC 799. DISSERTATION: DOCTORAL (credit varies)
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

Elementary Education (EDE)

LOWER LEVEL COURSES

EDE 201. INTRODUCTION TO EARLY CHILDHOOD EDUCATION (4)
An overview of early childhood education with emphasis on its historical development, current theories, and practices.

UPPER LEVEL COURSES

EDE 409 through EDE 440 open only to upper-level majors in Early Childhood, Elementary, or Exceptional Child Education.

EDE 409. READING FOR THE CHILD (5)
PR: Admission to College of Education and EDF 305.

Readiness, word recognition (phonics, structural, and contextual analysis) word meanings, basic study skills, comprehension abilities and reading interests: in-school work required.

EDE 411. LANGUAGE ARTS FOR THE CHILD (4)
PR: Admission to College of Education. Speaking, writing, reading and listening experiences of children and ways these skills are developed for individual creative expression.

EDE 413. LITERATURE FOR THE CHILD (4)
PR: Admission to College of Education. History and development of children's literature. Study of bibliographic sources, criteria and techniques for selection and use.

EDE 415. ARITHMETIC FOR THE CHILD (5)
PR: Admission to College of Education and MTH 331, 332, 333, or equivalent. Methods of teaching elementary school mathematics.

EDE 417. SCIENCE FOR THE CHILD (5)
PR: Admission to College of Education and completion of General Distribution Requirement biological or physical science in sequence. Techniques and materials for teaching science in the elementary school.

EDE 419. SOCIAL STUDIES FOR THE CHILD (5)
PR: Admission to College of Education and completion of General Distribution Social Science sequence. Significant concepts in the subjects concerned with human relationships. Emphasis upon teaching pupils to solve rather than be engulfed by social problems.

EDE 421. ART FOR THE CHILD (4)
PR: Admission to College of Education. Art and the intellectual, creative, emotional, and esthetic growth of children.

EDE 423. MUSIC FOR THE CHILD: SKILLS (2)
PR: Admission to College of Education. Voice production, music reading, creative composition and some instrumental experience. School song materials used to support this work.

EDE 424. MUSIC FOR THE CHILD: METHODS (3)
PR: Admission to College of Education & EDE 423. Music Literature and teaching aids for children including singing, rhythmic, creative, instrumental and listening experiences and their presentation.

EDE 425. HEALTH, PHYSICAL EDUCATION FOR THE CHILD (4)
PR: Admission to College of Education. Motivating factors of play; knowledge and skill in basic rhythmic activities; games and stunts; health instruction for the child.

EDE 426. CREATIVE EXPERIENCES IN EARLY CHILDHOOD EDUCATION (4)
PR: Admission to College of Education. The development of the child's creative expression through art, music, dance, play, and drama; included are the materials content, and teaching techniques.

EDE 429. PROGRAMS IN EARLY CHILDHOOD EDUCATION (5)
PR: Admission to College of Education. A study of school programs for children ages 3-8. Analysis and evaluation of these programs in the light of the most effective current classroom practices. Observation and participation included. (Formerly EDE 529.)

EDE 435. LANGUAGE AND LEARNING IN EARLY CHILDHOOD (4)
PR: Admission to College of Education. The study of the acquisition of language in young children and the development of basic communications skills in the Language Arts Curriculum, infancy through age 8 years. (Formerly EDE 531.)

EDE 440. TEACHING METHODS IN THE ELEMENTARY SCHOOL (4)
PR: Admission to the College of Education. Suggested co-requisite: EDC 401. Process of teaching elementary school
subjects. To be taken quarter prior to internship. Six hours per week as pre-intern in public schools required. (S/U only).

EDE 445. DIAGNOSIS AND TREATMENT OF LEARNING DISABILITIES IN SCHOOL MATHEMATICS (4)
PR: EDE 415 or equivalent. Presentation and analysis of teaching methods and models appropriate for use with children experiencing learning disabilities in mathematics; supervised conduct of a case study. (Formerly EDE 515.)

FOR SENIORS AND GRADUATE STUDENTS

EDE 519. SOCIAL GROWTH IN CHILDHOOD (4)
PR: Admission to College of Education. A study of the principal factors which influence the social development of young children with particular emphasis upon those cultural influences which affect both child development and the educational programs for the young child.

EDE 527. DEVELOPMENTAL PROCESSES IN EARLY CHILDHOOD (4)
PR: Admission to College of Education. The normal processes of development among children ages 3-8, the relation between these characteristics and the curriculum: child study through observation required.

EDE 539. WORKSHOP IN EARLY CHILDHOOD EDUCATION (4)
PR: Admission to College of Education. Individual problems and innovations related to methods and materials of instruction in the early childhood grades.

EDE 551. TEACHING METHODS IN THE MIDDLE SCHOOL—ENGLISH LANGUAGE ARTS (4)
PR: CJ. Analysis of nature and communication needs of students in grades 5-8 with emphasis on laboratory methods of teaching language.

FOR GRADUATE STUDENTS ONLY

EDE 603. SEMINAR IN CURRICULUM RESEARCH (1-5)
PR: EDF 607. Critical evaluation of current research and curriculum literature, design and analysis of individual research topics leading to satisfaction of research requirements.

EDE 609. TRENDS IN READING IN THE ELEMENTARY SCHOOL (4)
PR: EDE 409 or equivalent. Extensive study of recent trends in materials, approaches, and procedures in teaching reading in the elementary school.

EDE 611. TRENDS IN LANGUAGE ARTS INSTRUCTION (4)
PR: EDE 411 and 413. Advanced materials and processes of instruction in elementary school language arts programs.

EDE 613. CREATIVE ARTS INSTRUCTION (4)
Creative processes in the teaching of visual arts, music, dance, and drama to elementary school pupils.

EDE 615. TRENDS IN MATHEMATICS INSTRUCTION (4)
PR: EDE 415 or equivalent. Philosophy, content and process of qualitative instruction in modern mathematics in elementary school programs.

EDE 617. TRENDS IN SCIENCE INSTRUCTION (4)
PR: EDE 417. Topics in the biological and physical sciences appropriate for teaching in excellent elementary school programs. Analysis of modern curriculum materials used in presenting science as a process of inquiry.

EDE 619. TRENDS IN SOCIAL STUDIES INSTRUCTION (4)
PR: EDE 419. Crucial concepts drawn from the social sciences. Analysis of the problems approach. Students will select an area of independent study on an advanced level.

EDE 621. ART FOR THE ELEMENTARY SCHOOL TEACHER (4)
Exploration of various materials and techniques in relationship to current theories about art and the intellectual, creative, emotional and esthetic growth of children.

EDE 629. ADVANCED PROGRAMS IN EARLY CHILDHOOD EDUCATION (4)
PR: EDE 429, EDF 605 or CI. A study of innovative curriculum designs in Early Childhood Education, with emphasis given to related research.

EDE 631. CHILDREN'S LITERATURE IN THE ELEMENTARY CLASSROOM (4)
PR: EDE 413. CI. A study of significant concepts, emerging trends and classroom techniques for implementation and utilization of children's literature in all areas of the curriculum.

EDE 639. HOME-SCHOOL-COMMUNITY INTERACTION IN EARLY CHILDHOOD EDUCATION (4)
PR: EDE 429, EDF 605 or CI. An intensive study of the roles of parents, teacher aides, and community agencies involved in the education of the young child.

EDE 641. PROBLEMS IN SUPERVISION (4)
PR: EDF 607 or equivalent and EDC 661. Problems in supervising for curriculum improvement within the elementary school.

EDE 645. ADVANCED DIAGNOSIS AND TREATMENT OF LEARNING DISABILITIES IN SCHOOL MATHEMATICS (4)
PR: EDE 415 or equivalent. Study of the symptoms etiologies and consequences of children's learning disabilities in mathematics; study and guided application of theoretical models used in diagnosis and treatment; supervised conduct of a case study. (Formerly EDE 515.)

EDE 646. ADVANCED PRACTICUM IN DIAGNOSIS AND TREATMENT OF CHILDREN'S LEARNING DISABILITIES IN MATHEMATICS (1-8)
PR: EDE 645. Supervised conduct of a case study with a child experiencing learning difficulties in mathematics. Procedures used and reporting practice employed developed in EDE 645 reviewed and extended. (Formerly EDE 516.)

EDE 651. THEORIES AND PATTERNS OF ADVANCED LANGUAGE ARTS INSTRUCTION (4)
PR: EDE 611 or equivalent. This course is organized to present new research findings and theories relating to language patterns and contemporary programs designed for teaching the language arts.

EDE 652. APPLICATIONS OF THEORIES TO THE DEVELOPMENT OF LANGUAGE ARTS PROGRAMS (4)
PR: EDE 611 or equivalent, EDE 651. This course is designed to apply research findings and theories for developing and organizing instructional improvement of the language arts.

EDE 687. SUBJECT SPECIALIZATION PLANNING: ELEMENTARY (4)
Individually planned course in an elementary school subject area for in-service teachers.

Exceptional Child Education (EDS)

EDS 311. EXCEPTIONAL CHILDREN IN THE SCHOOLS (4)
PR: EDF 305 or CI. Characteristics and needs of the Culturally Disadvantaged, Emotionally Disturbed & Socially Maladjusted, Gifted, Hearing Impaired, Mentally Retarded, Physically Handicapped, Speech Impaired, & Visually Limited.

EDS 322. INTRODUCTION TO MENTAL RETARDATION (4)
PR: EDF 305. EDS 311, or CI. Classification, diagnosis, characteristics, and treatment of the mentally retarded.

EDS 329. UNDERGRADUATE SUPERVISED PRACTICUM IN MENTAL RETARDATION (4)
Supervised Practicum experiences in the educational, social and vocational planning of mentally retarded individuals.
EDS 350. INTRODUCTION TO GIFTED CHILDREN (4)
PR: Junior class standing. Diagnosis, characteristics, and educational provision for the gifted and talented.

EDS 359. FIELD WORK WITH GIFTED CHILDREN (1-6)
Organized, supervised experiences with gifted children. Specific experiences may be either a combination of observation and assistance with gifted children or individualized projects.

EDS 389. UNDERGRADUATE SUPERVISED PRACTICUM IN SPECIFIC LEARNING DISABILITIES (6)
PR: EDS 311, EDS 481, and Cl. Supervised practicum experiences in classes for children with specific learning disabilities.

EDS 411. EDUCATIONAL ASSESSMENT OF EXCEPTIONAL CHILDREN (4)
PR: EDF 305, EDS 311, and Special Educational Major. Introduction to and familiarization with formal and informal techniques used to measure and evaluate all exceptional children. The interpretation of information so derived for utilization in educational programming and individualization of instruction.

EDS 423. PROCEDURES AND MATERIALS FOR ELEMENTARY AGE EDUCABLE MENTALLY RETARDED CHILDREN (4)
PR: EDS 329 and Cl. Special class organization, curriculum development, procedures and materials for elementary age educable mentally retarded children. (Formerly EDS 423 I.)

EDS 424. EDUCATIONAL PROCEDURES FOR THE TRAINABLE MENTALLY RETARDED (4)
PR: EDS 322 or Cl. Special class organization, curriculum adjustments, methods and techniques of teaching the trainable retarded.

EDS 425. PROCEDURES AND MATERIALS FOR SECONDARY AGE EDUCABLE MENTALLY RETARDED YOUTH AND ADULTS (4)
PR: EDS 329 and Cl. Special class organization, curriculum development, procedures and materials for secondary age educable mentally retarded youth and adults. (Formerly EDS 423 II.)

EDS 431. CLASSROOM MANAGEMENT OF CHILDREN AND YOUTH WITH BEHAVIOR DISORDERS (4)
PR: EDF 305, EDS 311, or Cl. Survey of emotional and social disorders in children and youth manifested as behavior problems in the classroom; intervention techniques; implications for management techniques in educational programs.

EDS 432. EDUCATIONAL PROGRAMMING FOR CHILDREN AND YOUTH WITH BEHAVIOR DISORDERS (5)
PR: EDF 305, EDS 311, EDS 411, EDS 431. Acceptance in Program for Emotionally Disturbed, concurrent enrollment in EDS 439. Methods and techniques for teaching children and youth with behavior disorders; individualization of instruction; planning and implementation of educational programs; precision teaching and behavior modification techniques as applied to the education of children and youth with behavior disorders.

EDS 439. UNDERGRADUATE SUPERVISED PRACTICUM IN BEHAVIOR DISORDERS (1-10)
PR: Acceptance in undergraduate program for Emotionally Disturbed. Supervised undergraduate practicum experiences with children and youth with behavior disorders. A one hour per week Seminar is required concurrent with practicum.

EDS 451. EDUCATION PROCEDURES FOR THE GIFTED (4)
PR: Junior class standing, EDS 350. Curriculum adjustment, methods, and techniques appropriate for the education of gifted children. Supervised experiences exploring creative techniques and the development of innovative teaching techniques will be provided.

EDS 481. THEORIES IN SPECIFIC LEARNING DISABILITIES (4)
PR: Senior standing and Cl. Characteristics, needs and abilities of children with specific learning disabilities. Emphasis is on theories, issues, trends, and philosophy of problems for such children. (Formerly EDS 581.)

EDS 482. SKILLS IN DIAGNOSIS AND INSTRUCTION FOR CHILDREN WITH SPECIFIC LEARNING DISABILITIES (4)
PR: EDS 481 and Cl. Instructional diagnosis and individualizing instruction for children with specific learning disabilities. (Formerly EDS 592.)

FOR SENIORS AND GRADUATE STUDENTS

EDS 511. THE SLOW LEARNER IN THE SCHOOL (4)
Characteristics, needs and educational planning for the slow learning child. Appropriate for special class teachers and regular class teachers.

EDS 529. GRADUATE SUPERVISED PRACTICUM IN MENTAL RETARDATION (1-14)
Supervised graduate practicum encompassing teaching and supervising experiences in public school classes for the mentally retarded.

EDS 531. BEHAVIOR DISORDERS IN THE SCHOOLS (4)
PR: EDF 305 or EDF 377 or PSY 200 or Cl. Survey of emotional and social disorders in children and the implications for educational programs. Students may not receive credit for both EDS 531 and PSY 613. Behavioral Disorders of Children.

EDS 541. THE CULTURALLY DISADVANTAGED AND THE SCHOOLS (4)
Characteristics and needs of the culturally disadvantaged and their implications for educational programming.

EDS 550. NATURE AND NEEDS OF THE GIFTED (4)
Characteristics and educational needs of gifted children and youth.

EDS 551. EDUCATIONAL PROCEDURES FOR THE GIFTED (4)
PR: EDS 550 or Cl. Curriculum adjustments, methods and techniques, classroom organization necessary for teaching the gifted.

EDS 559. SUPERVISED PRACTICUM FOR THE GIFTED(1-14)
Planned supervised participation in activities related to specific areas of the gifted.

EDS 560. THE VISUALLY HANDICAPPED IN THE CLASSROOM (4)
PR: EDS 311 and Cl. The visually handicapped in the classroom, structure, hygiene and educational implications. (Formerly EDS 660.)

EDS 561. EDUCATIONAL PROBLEMS OF THE PHYSICALLY HANDICAPPED (4)
PR: EDS 311 or Cl. Introduction to the educational, psychological and social problems of the physically disabled child in the public schools.

EDS 562. TEACHING THE CEREBRAL PALSYED CHILD (4)
PR: EDS 311 or Cl. Introduction to the educational, psycho- aspects of cerebral palsy and its implications for classroom teachers. (Formerly EDS 662.)

FOR GRADUATE STUDENTS ONLY

EDS 610. SEMINAR IN SPECIAL EDUCATION (4)
A critical survey of the literature related to the psychological, sociological, and education problems of exceptional children.

EDS 611. PSYCHO-EDUCATIONAL APPRAISAL OF EXCEPTIONAL CHILDREN (4)
PR: EDS 311 or EDS 610, EDS 411, EDF 607 or Cl. Educational planning for exceptional children based on diagnostic information. Includes both lecture and practicum experiences in evaluative and instructional techniques for exceptional children.
EDS 612. SUPERVISION OF EXCEPTIONAL CHILD PROGRAMS (4)
PR: Cl. Principles of supervision and their application to exceptional child education.

EDS 613. ADMINISTRATION OF EXCEPTIONAL CHILD PROGRAMS (4)
PR: Cl. Procedure which local, state, and national administrators may use to implement services for exceptional children.

EDS 620. BIOLOGICAL ASPECTS OF MENTAL RETARDATION (4)
PR: EDS 322 or Cl. The contribution of biological factors towards the causation of mental deficiency; implications for casefinding, care, and education.

EDS 621. SOCIOLOGICAL AND EDUCATIONAL ASPECTS OF MENTAL RETARDATION (4)
PR: EDS 311, Cl. Evaluation of relevant literature.

EDS 622. ADVANCED EDUCATIONAL PROCEDURES FOR THE MENTALLY RETARDED (4-8)
PR: EDS 423, experience in teaching the retarded, identification of a problem prior to registration, or Cl. Specific curriculum and methodological problems in teaching the retarded.

EDS 631. EDUCATIONAL IMPLICATIONS OF THE PSYCHOPATHOLOGIES OF EXCEPTIONAL CHILDREN (4)
PR: EDS 531 and Cl. In-depth survey of childhood psychopathology covering autism, schizophrenia and psychotic behavior. Guided exploration of exemplary services, treatment and methodology.

EDS 632. EDUCATIONAL PROGRAMMING FOR EMOTIONALLY DISTURBED CHILDREN I (4)
PR: EDS 531 and Cl. Personality dynamics and research findings as related to the interpretation of disturbed behavior; techniques for the management of individual, small group, and classroom behavior.

EDS 633. EDUCATIONAL PROGRAMMING FOR EMOTIONALLY DISTURBED CHILDREN II (4)
PR: EDS 531, 632, or Cl. Personality dynamics and learning theory related to the facilitation of learning and communication; techniques for teaching both individuals and groups with emphasis on improved interpersonal relations, academic learning, and communication skills.

EDS 639. FIELD WORK IN EMOTIONALLY DISTURBED (1-14)
PR: EDS 531 (may be taken concurrently) and Cl. Supervised graduate practicum experiences with emotionally disturbed children. A one hour per week Seminar is required concurrent with practicum.

EDS 643. GUIDANCE AND COUNSELING OF EXCEPTIONAL CHILDREN AND THEIR PARENTS (5)
PR: EDS 610 and Cl. Investigation of the guidance needs of exceptional children and parents. Through child study techniques, opportunities will be provided for the development of skills in guiding parents of exceptional children in providing assistance/support in their total development and use of potential.

EDS 649. FIELD WORK WITH POTENTIALLY HANDICAPPED (CULTURALLY DISADVANTAGED) (1-9)
Teaching and participation in activities related to teaching disadvantaged young children (N-3).

EDS 653. SEMINAR IN EDUCATION OF THE GIFTED: RECENT RESEARCH (4)
A critical survey of the literature related to the psychological and educational problems of gifted children.

EDS 654. SEMINAR IN EDUCATION OF THE GIFTED: PROGRAMS (4)
A survey of existing programs for the gifted and evaluation of relevant literature. Individual students will plan and present a model program for the gifted.

EDS 680. CURRENT TRENDS AND ISSUES RELATED TO EDUCATING SPECIFIC LEARNING DISABILITIES CHILDREN (4)
PR: Cl. Trends and issues related to educating children with specific learning disabilities. (Formerly EDS 681.)

EDS 682. ADVANCED ASSESSMENT AND PROCEDURES FOR SPECIFIC LEARNING DISABLED YOUNGSTERS (4)
PR: Cl. Concepts related to the assessment and teaching of specific learning disabled children.

EDS 700. PHILOSOPHY AND PROCESS IN THE PREPARATION OF SPECIALISTS IN SPECIAL EDUCATION (4)
PR: Admission in the Program for Ed.S. and Ph.D. in Education. In depth exploration of the philosophy and theory in special education. A theoretical basis for the preparation of specialists in the field of exceptional child education.

EDS 710. SEMINARS IN SPECIAL EDUCATION (1-10)
PR: Preliminary Admission to The Graduate Program and Cl. Seminar Topics will vary to include neurophysiological mechanisms, current trends, issues, and curriculum development in Special Education. May be repeated for a maximum of 10 hours.

EDS 712. RESEARCH STUDIES AND THEIR IMPLICATIONS IN THE EDUCATION OF EXCEPTIONAL CHILDREN (5)
PR: EDF 605, 607 or equivalent. Cl. This course will involve a study of current research in exceptional child education. The transition from theory into practice will be made through the examination and discussion of implications to the field of special education that can be drawn from the research.

EDS 714. EDUCATIONAL IMPLICATIONS OF PSYCHOSOCIAL ASPECTS OF EXCEPTIONAL CHILDREN (1-8)
PR: Cl. This course will be concerned with the identification of the psycho-social needs and characteristics of exceptional children. Opportunity will also be given to the analysis of the educational implications of these needs and characteristics. May be repeated for a maximum of 8 hours.

EDS 719. FIELD WORK WITH EXCEPTIONAL CHILDREN (1-8)
PR: Cl. Practical field experience in curriculum development, classroom teaching, supervision and/or administrative areas in special education. May be repeated for a maximum of 8 hours.

EDS 783. SELECTED TOPICS IN SPECIAL EDUCATION (1-12)
PR: EDS 712 or Cl. Identification and specification of a research problem in special education. Opportunity will be provided for the student to gather and process data, culminating in a written report and/or oral presentation to fellow student researchers. May be repeated for a maximum of 12 hours.

EDS 785. SPECIALIZED STUDY IN MENTAL RETARDATION, EMOTIONALLY DISTURBED, SPECIFIC LEARNING DISABILITIES, AND GIFTED EDUCATION (1-12)
PR: Cl. Exploration and demonstration of knowledge in an area of interest to the student in special education. The specialized study may also include areas for which the student needs to demonstrate a higher level of competency. May be repeated for a maximum of 12 hours.

English Education (EDT)

UPPER LEVEL COURSES

EDT 431. CURRENT TEACHING OF ENGLISH LANGUAGE AND MEDIA (4)
PR: Acceptance into College of Education. EDT 431, EDT
447, and EDC 401 are typically taken concurrently. Methods of teaching language and media. Includes current findings on teaching usage, dialect, grammar, and semantics, as well as approaches to media in English.

EDT 447. METHODS OF TEACHING ENGLISH—LITERATURE AND READING (4)
PR: EDT 431, EDT 447, and EDC 401 are typically taken concurrently. A survey of materials available to adolescent readers plus an overview of organizational strategies for teaching literature and reading.

FOR SENIORS AND GRADUATE STUDENTS
EDT 583. SELECTED TOPICS IN THE TEACHING OF ENGLISH (4)
PR: Certification in English and/or Mass Communications and approval of graduate adviser. Investigation of topics which are of special interest to the student and are related to the teaching of English in the secondary school. Topics will be selected by the student in accordance with his particular goals and will be approved by the student’s graduate adviser.

FOR GRADUATE STUDENTS ONLY
EDT 631. CURRENT TRENDS IN SECONDARY ENGLISH EDUCATION (4)
Curricular patterns and instructional practices in secondary English.

EDT 633. CURRENT TEACHING OF THE ENGLISH LANGUAGE (4)
Application of recent techniques of language study to classroom teaching of English, especially in relation to current textbooks.

EDT 651. NEW PERSPECTIVES ON THE TEACHING OF LITERATURE IN SECONDARY SCHOOLS (4)
PR: Certification in English or Mass Communications. Survey of recent investigation into adolescents’ perception of and responses to literature and implications for organization and presentation of literature curricula.

EDT 661. NEW PERSPECTIVES ON THE TEACHING OF MEDIA IN SECONDARY ENGLISH (4)
PR: Certification in English of Mass Communications. An examination of new methods and materials designed specifically for media based activities in the secondary English classroom.

Foreign Language Education (EDX)

UPPER LEVEL COURSES
EDX 449. TEACHING METHODS IN THE SECONDARY SCHOOL—FOREIGN LANGUAGE (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in foreign languages. To be taken in the quarter prior to internship.

EDX 465. TEACHING METHODS IN THE SECONDARY SCHOOL—LATIN (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in Latin.

FOR GRADUATE STUDENTS ONLY
EDX 649. CURRENT TRENDS IN SECONDARY FOREIGN LANGUAGE EDUCATION (4)
PR: Consultation with instructor, plus foreign language fluency. Curricular patterns and instructional practices in the teaching of secondary foreign languages.

Foundations (EDF)

UPPER LEVEL COURSES
EDF 303. INTRODUCTION TO MEASUREMENT AND EVALUATION (4)
PR: Upper level standing. Elementary concepts basic to a general understanding of measurement and evaluation procedures.

EDF 505. HUMAN DEVELOPMENT AND LEARNING (4)
PR: SSI 201, 203 or General Psychology; and admission to College of Education or CC. Application of respondent and operant learning principles to classroom learning, teaching models for different instructional goals, analysis of teacher behavior, micro-teaching. Credit cannot be earned for both EDF 305 and EDF 377.

EDF 307. SOCIAL FOUNDATIONS OF EDUCATION (4)
PR: Admission to College of Education. Social, economic and political context within which schools function and the values which provide direction for our schools; the culture as a motivating influence in instruction. Should not be taken concurrently with EDF 305.

EDF 309. PHILOSOPHY OF EDUCATION (4)
PR: Upper level standing. A critical analysis of selected philosophies of education in terms of their beliefs about the nature of man and society and their related assumptions about the nature of reality, knowledge and value.

EDF 311. COMPARATIVE EDUCATION (4)
PR: Upper level standing. A comparison of contemporary educational systems of selected countries with that of the United States.

EDF 313. VALUES CLARIFICATION FOR TEACHERS (4)
PR: Junior standing recommended. Techniques for teachers in identifying and analyzing values and value orientations of individuals and groups of students in the school.

EDF 377. EDUCATIONAL PSYCHOLOGY (4)
PR: Upper Level standing. The application of behavioral principles to human behavior in educational institutions, home and community settings. Credit cannot be earned for both EDF 305 and EDF 377. (For non-education majors only.)

EDF 379. BEHAVIOR MODIFICATION TECHNIQUES (4)
PR: EDF 305. Special techniques in behavior modification for children with learning difficulties.

EDF 444. WOMEN AND THE EDUCATIONAL PROCESS (4)
PR: Junior standing recommended. Covers both the role women played in education in the U.S. and the way schools have helped to shape the role women play in American society. Topics include development of sex-role stereotypes through classroom interactions and curriculum materials, the status of women in public and higher education and laws affecting it, and the role of the schools in forming educational and career aspirations of girls and women. Emphasis will be placed on ways parents and teachers may counteract the sexotyping which schools, as they are currently structured, perpetuate. (Also offered as WSP 444.)

FOR SENIORS AND GRADUATE STUDENTS
EDF 502. ADOLESCENCE (4)
A study of the educational, intellectual, personality, physical, social and vocational factors in adolescence.

EDF 575. AMERICAN DEMOCRACY AND PUBLIC EDUCATION (4)
Interdependence of the public school and democracy in the United States and the responsibility of the school in fostering and strengthening basic democratic principles.

EDF 585. PROGRAMMED INSTRUCTION AND TEACHING MACHINES (4)
Principles for programming in the several academic subjects.

FOR GRADUATE STUDENTS ONLY
EDF 605. FOUNDATIONS OF MEASUREMENT (4)
Fundamental descriptive statistics, basic measurement concepts, role of measurement in education, construction of teacher-made tests and interpretation of standardized tests.

EDF 607. FOUNDATIONS OF EDUCATIONAL RESEARCH (4)
PR: EDF 605. Major types of educational research, with emphasis upon understanding the experimental method.
EDF 611. PSYCHOLOGICAL FOUNDATIONS OF EDUCATION (4)
Selected topics in psychology of human development and learning.

EDF 612. CHILD DEVELOPMENT (4)
PR: EDF 611 or CI. Educational, emotional, hereditary, intellectual, social and physical factors influencing child growth and development.

EDF 613. PRINCIPLES OF LEARNING (5)
A consideration of several theories of learning and related research studies in regard to classroom application.

EDF 615. BIOLOGICAL BASES FOR LEARNING AND BEHAVIOR (5)
PR: One course in Educational Psychology. A study of human biological development and its influence upon learning and behavior.

EDF 617. MEASUREMENT OF INDIVIDUAL INTELLIGENCE (5)
PR: EDF 305 or 605 or equivalent and a course in educational measurement of statistics. Administration and interpretation of individual measures of intelligence. Students may not receive credit for both EDF 617 and PSY 617. Individual Intelligence Testing.

EDF 621. SOCIO-ECONOMIC FOUNDATIONS OF AMERICAN EDUCATION (4)
Significant socio-economic factors as they relate to major problems facing American education.

EDF 623. HISTORICAL FOUNDATIONS OF AMERICAN EDUCATION (4)
Historical and comparative problems in American education which are relevant to contemporary issues.

EDF 625. PHILOSOPHICAL FOUNDATIONS OF AMERICAN EDUCATION (4)
Major philosophies of education which are relevant to an understanding of contemporary educational issues.

EDF 627. PROSEMINAR IN COMPARATIVE EDUCATION (4)
Contemporary policies and practices in education in selected countries of the world. Methodology in Comparative Education. Consideration will be given to needs and interests of individual students.

EDF 631. THEORIES OF PERSONALITY FOR SCHOOL PERSONNEL (4)
A comparative and integrated study of personality development according to major psychological theories. Application of the theoretical constructs to education and guidance.

EDF 635. BEHAVIOR THEORY AND CLASSROOM LEARNING (4)
PR: EDF 613 or CI. Theoretical and practical application of behavior modification. Will cover: Introduction into experimental methods, e.g., independent, dependent variables; and internal validity; principles of positive reinforcement; shaping and successive approximations; application of reinforcement (parameters); operant behavior under extinction; operant methods in behavior and development; readings in behavior modification—critical analysis; field work.

EDF 644. WOMEN AND EDUCATION (4)
Course is designed to enable public school personnel, teachers, counselors, administrators and other professionals, to identify those aspects of public education which perpetuate sex role stereotyping. Emphasis will be placed on how the law and formal and informal affirmative action actions can be employed to correct sexism in schools.

EDF 671. SELECTED TOPICS (2-4)
PR: CI. Exploration and demonstration of knowledge in an area of special interest to the student and/or in an area for which the student needs to demonstrate a higher level of competence. Defined to fit the needs of each student.

EDF 675. FIELD EXPERIENCE (1-5)
PR: CI. Demonstrate skills in the practice of the student's specialty. Specific objectives will be defined according to the needs of the individual student.

EDF 701. EDUCATION IN METROPOLITAN AREAS (4)
PR: Graduate Standing; EDF 621, 623, or 625 or permission of the instructor. An examination of the school as a formal, socializing institution in relationship to the residential populations found within the metropolitan structure with specific reference to methodologies useful for educational planning. Topics will include an identification of the metropolitan concept; an analysis of metropolitan forms, functions and dynamics; a study of socio-economic structure and ethnic composition of residential populations and; a discussion of the school as a metropolitan institution interacting with a spectrum of socio-economic and ethnic groups.

EDF 702. SCHOOL REFORM (4)
PR: Graduate Standing; EDF 621, 623, or 625 or permission of the instructor. An examination of the history, background, sources, dynamics and effects of attempts at school reform. Topics will include role of individuals, foundations, legislation, demography, politics, media, and technology as they relate to reform aims and strategies; distinctions between short term planning for change and the preparation of long-term future strategies.

EDF 703. ANALYSIS OF EDUCATIONAL ISSUES (4)
PR: Graduate Standing; EDF 621, 623, or 625 or permission of Instructor. An examination and analysis of selected critical issues in public schooling in terms of their axiological, historical, and socio-cultural bases. Includes such topics as: problems of curriculum reform, influence of legislation and court rulings on school teaching and administration, teachers' organizations, and problems of educational support. Emphasis will be placed on ways of conceptualizing and evaluating problems and issues.

EDF 704. CLASSICS IN EDUCATIONAL RESEARCH (4)
PR: Graduate Standing; EDF 621, 623, or 625 or CI. An examination of the context, methodology, and impact of significant research studies in education. Topics will include studies of the Herbartians, J. M. Rice, E. L. Thorndike, G. S. Hall, L. P. Ayers, Willard Waller, the Reading Studies, the Eight Year Study, and School Surveys.

Guidance (EDG)

EDG 401. INTRODUCTION TO GUIDANCE (5)
PR: Upper level standing. An introduction to the role and function of guidance, school psychology, social work and other pupil personnel services from kindergarten through junior college.

EDG 402. INTRODUCTION TO STUDENT PERSONNEL WORK IN HIGHER EDUCATION (5)
PR: CI. Study of student personnel services in institutions of higher education. Identification of the needs of students and of the ways to respond to meet these needs. Survey of service units on a campus, in terms of structure, organization, funding, and evaluation of each unit.

EDG 404. PROBLEMS IN RESIDENCE HALL MANAGEMENT (2)
PR: CI. In-depth study of problems related to residence hall living.

FOR SENIORS AND GRADUATE STUDENTS

EDG 503. GUIDANCE IN VOCATIONAL EDUCATION (4)
PR: CI. Application of guidance theories and skills to the work of vocational educators. The guidance role of teachers and their relationships with counselors in providing guidance services.

EDG 529. COMPARATIVE GUIDANCE (4)
PR: CI. Study of guidance theories and practices in selected foreign countries as compared with the American guidance
model. Evaluation of foreign guidance through critical analysis of primary sources. For example: guidance philosophy and practice in countries of the Soviet Bloc. (Formerly EDG 629)

FOR GRADUATE STUDENTS ONLY

EDG 601. PRINCIPLES OF GUIDANCE (5)
PR: CI. Required first course in specialization sequence for all guidance majors. Guidance as a profession; philosophic framework of the guidance program, its scope and place in the total educational context.

EDG 603. THE INFORMATIONAL SERVICE IN GUIDANCE (4)
PR: EDG 601. Occupational structure in the United States; sources and uses of educational, occupational, social and personal information; collecting, classifying and communicating such information.

EDG 609. THE APPRAISAL PROCEDURES IN GUIDANCE (5)
PR: EDF 605, EDG 601. A study of test and non-test techniques of appraisal with emphasis on the use of standardized test data in guidance programs and the use of the individual case study approach.

EDG 613. ORGANIZATION AND ADMINISTRATION OF GUIDANCE SERVICES IN ELEMENTARY SCHOOLS (3)
PR: EDG 601. Organization of a guidance program in the elementary school, its relation to instruction and administration. Guidance roles and relationships of members of the school staff.

EDG 615. ORGANIZATION AND ADMINISTRATION OF GUIDANCE SERVICES IN SECONDARY SCHOOLS (3)
PR: EDG 601. Organization of a guidance program and its place in the total educational program; responsibilities of various staff members and their relationships to each other.

EDG 617. GROUP PROCEDURES IN GUIDANCE (5)
PR: EDG 601 and EDG 621. Counterpart of EDG 619 for prospective secondary school counselors. Use of groups in the counseling and guidance of children and in working with parents and teachers.

EDG 619. GROUP PROCEDURES IN GUIDANCE IN SECONDARY SCHOOLS (3)
PR: EDG 601 and EDG 623. Group interaction and values of group activity for guidance purposes. Methods and techniques for working with groups.

EDG 621. THE COUNSELING SERVICE IN GUIDANCE IN ELEMENTARY SCHOOLS (5)

EDG 623. COUNSELING THEORIES AND PRACTICES (5)
PR: EDG 601 and EDF 631. CI. Nature of the counseling process with emphasis on some theoretical approaches and practical techniques.

EDG 625. PRACTICUM IN ELEMENTARY GUIDANCE COUNSELING AND CONSULTING (6)
This course is the counterpart of EDG 627 for prospective secondary school counselors; enrollment by permission of program chairman only. Counseling with children in groups as well as individually; consultations with parents, teachers, administrators, and fellow professionals regarding the children being counseled. (S/U only.)

EDG 627. PRACTICUM IN SECONDARY SCHOOL GUIDANCE COUNSELING (6)
Final course in guidance program; enrollment by permission of program chairman only. Supervised practice in working with individuals in counseling relationship. (S/U only.)

EDG 633. SEMINAR IN GUIDANCE (1-3)
PR or CR: EDG 601, CI. Significant issues in the field of guidance; topics for discussion will vary according to needs and interests of students. (S/U only.) May be repeated for credit for a maximum of 6 hours.

EDG 679. INDIVIDUAL STUDY (1-5)
PR: CI. Independent study, research and experiences relating to guidance and pupil personnel services under the supervision of a member of the Guidance Program faculty. (May be repeated for maximum total of 5 hours.) (Formerly EDG 681.)

Health Education (HEN)

LOWER LEVEL COURSES

HEN 201. CONTEMPORARY HEALTH SCIENCE (4)
A comprehensive approach to health concerns and problems in contemporary society, including methods of assessing individual health needs. (S/U only.)

UPPER LEVEL COURSES

HEN 310. PROCESSES AND PROGRAMS IN HEALTH EDUCATION (3)
PR: Admission to Health Education Program, or CI. Survey of programs in Health Education in the schools and community. Processes in programs and curriculum development will also be emphasized. (S/U only.)

HEN 311. STRUCTURE AND FUNCTION OF THE HUMAN BODY (6)
PR: Admission to Health Education Program, or CI. A study of the normal structure and function of the human body. Focus is on the relationship of structure, function, and health status. (S/U only.)

HEN 321. HEALTH EDUCATION AND RELATED HEALTH SCIENCE CONTENT: CHILDREN (4)
PR: Admission to the program or CI. Programs, curriculum, health services, and health education related to health needs and interests of children. (S/U only.)

HEN 322. SEMINAR AND INTERNSHIP—CHILD HEALTH EDUCATION AND PROGRAMS (5)
PR: Admission to program. Supervised field experiences in school (k-3), pre-school, and community health agencies. Scheduled seminars will be conducted on campus and in the field. (S/U only.)

HEN 331. HEALTH EDUCATION AND RELATED HEALTH SCIENCE CONTENT: PUBESCENCE (5)
PR: Admission to the program or CI. Programs, curriculum, health services and health education related to health needs and interest of pubescence. (S/U only.)

HEN 332. SEMINAR AND INTERNSHIP IN HEALTH EDUCATION PROGRAMS—PUBESCENCE (5)
PR: Admission to the program or CI. Supervised teaching in health education (middle school or junior high school). Selected field experiences in community health programs. (S/U only.)

HEN 333. SOCIETY: CHILD AND PUBESCENT HEALTH (2)
PR: Admission to the program of CI. Seminar for students, supervisors and professionals from health related disciplines. (S/U only.)

HEN 411. HEALTH EDUCATION AND RELATED HEALTH SCIENCE CONTENT: ADOLESCENTS AND YOUNG ADULTS (4)
PR: Admission to the program or CI. A study of health needs, programs, services and health content areas of adolescents and young adults. (S/U only.)

HEN 412. SEMINAR AND INTERNSHIP: HEALTH EDUCATION AND PROGRAMS—ADOLESCENTS AND YOUNG ADULTS (5)
PR: Admission to the program or CI. Supervised teaching in senior high schools and selected field experiences in community health programs. (S/U only.)
HEN 421. HEALTH EDUCATION AND RELATED HEALTH
SCIENCE CONTENT: ADULTS (4)
PR: Admission to the program or CI. A study of health needs, services and health education programs focusing on adults, including the aging. (S/U only.)

HEN 422. SEMINAR AND FIELD EXPERIENCE: ADULT
HEALTH (5)
PR: Admission to the program. Supervised field experiences in adult health programs in schools and the community. (S/U only.)

HEN 423. SOCIETY AND HEALTH: ADULTS (2)
PR: Admission to the program or CI. A seminar for students, physicians, social workers, health educators from public and private agencies, nutritionists, health care personnel, etc., for the exchange of program information and new developments in health information and research. (S/U only.)

HEN 431. CURRENT PROBLEMS IN HEALTH (4)
PR: Admission to the program or CI. An investigation of current health problems, programs and research methods. (S/U only.)

HEN 432. SEMINAR AND FIELD EXPERIENCE: CURRENT
HEALTH PROBLEMS (5)
PR: Admission to the program. Supervised field experience in selected health programs. (S/U only.)

Humanities Education (EDY)

EDY 433. CURRENT TRENDS IN THE TEACHING OF
HUMANITIES (4)
Curricular patterns, materials, and instructional practices in the teaching of humanities. (Formerly EDY 533)

Junior College (EDH)

EDH 651. THE JUNIOR COLLEGE IN AMERICAN HIGHER
EDUCATION (4)
History of higher education, philosophical and cultural bases for definition of its role, and contemporary issues, such as control, financing, and curricular patterns. The place and problems of the community junior college will be central concerns of this course.

EDH 653. SEMINAR IN COLLEGE TEACHING (5)
Implications of learning theory and student characteristics for teaching at the college level. Types of teaching procedures, innovation, evaluation, student freedom and responsibility for learning.

Library-Audiovisual Education (EDL)

EDL 500. FOUNDATIONS OF LIBRARIANSHIP (4)
Overview of and introduction to the study of library service; history; organization; specialized literature; outstanding leaders; current trends, issues, and problems. Place of the library in society with its contributions to that society. (Formerly EDL 600.)

EDL 508. TELEVISION IN THE SCHOOL (4)
Utilization of open and closed circuit broadcasting in the instructional process.

EDL 520. MEDIA AND EDUCATIONAL FACILITIES (3)
Designing teaching stations and media centers for effective media utilization. Practice in helping classroom teachers modify existing classrooms in the use of newer media.

EDL 525. INSTRUCTIONAL GRAPHICS (4)
PR: CI. Theoretical aspects, planning and production of instructional graphic material. The theory of graphic communications. Interpreting needs for instructional materials appropriate for given behavioral objectives.

EDL 526. PREPARING SINGLE CONCEPT FILMS (4)
PR: CI. Techniques and procedures in the preparation of educational films. Ascertaining concepts, script writing, graphics, lighting, filming, editing.

FOR GRADUATE STUDENTS ONLY

EDL 600. INTRODUCTION TO LIBRARY
ADMINISTRATION (4)
Behavioral approach to planning, organizing, staffing and controlling libraries as organizations; identification of administrative principles, theories, and problems of all types of libraries; critical examination of methods of administration supporting library functions, programs, and services; fiscal and legal responsibilities of libraries.

EDL 601. SELECTION OF LIBRARY MATERIALS (4)
Bibliographical sources, evaluative criteria for books and principles of book selection for libraries.

EDL 602. HISTORY OF LIBRARIES (4)
Development of libraries as found from the earliest records to the great libraries of modern times and the library as a social institution.

EDL 603. INFORMATION SCIENCE IN LIBRARIANSHIP (4)
Historical overview of the emergence of information science as a discipline. The fundamental concepts of information retrieval systems and subsystems, related information technologies, and their applications to the field of librarianship.

EDL 604. CONTEMPORARY PUBLISHING AND
PRINTING (4)
PR: EDL 601. A survey of book publishing as it is carried on today, primarily in the United States. Emphasis on structure of the industry, economic conditions, technological developments, social functions of book publishing and distribution. Complementary relations between libraries and publishing.

EDL 605. HISTORY OF CHILDREN'S LITERATURE (5)
Historical bibliographical survey of imaginative and informational literature for children.

EDL 606. BASIC INFORMATION SOURCES AND
SERVICES (4)
An in-depth examination of the basic sources of information in the general library; discussion of bibliographical control of all communication media, with emphasis on those tools which are of most value to general reference services; and the provision of various types of reference services. (Formerly EDL 513.)

EDL 607. THE CURRICULUM AND INSTRUCTIONAL
TECHNOLOGY (5)
Effective utilization of instructional materials as they relate to specific areas of the curriculum in elementary and high school programs.

EDL 608. RESEARCH METHODS IN LIBRARIANSHIP (4)
Overview of present status of research in library and information science; introduction to research methods and their application to librarianship; designed to prepare students to plan, conduct, and evaluate research relating to the acquisition, classification, cataloging, retrieval, and dissemination of information. Open to both majors and non-majors in library-audiovisual education.

EDL 609. SUPERVISED FIELD WORK (4)
PR: Completion of General Program Requirements and CI.

EDL 610. BOOKS AND RELATED MATERIALS OF LATIN
AMERICAN COUNTRIES SUITABLE FOR CHILDREN AND
YOUNG PEOPLE (4)
Bibliographic sources, aids and tools for the selection and utilization of Latin American books and related materials suitable for children and young people. Examination of representative materials in terms of the basic principles and criteria of selection for libraries.
EDL 611. ADVANCED INFORMATION SOURCES AND SERVICES (4)
PR: EDL 606. Reference materials in the humanities, social sciences, science, and technology.

EDL 612. THE ORGANIZATION AND ADMINISTRATION OF THE SCHOOL MEDIA CENTER (5)
PR: General Program Requirements or CI. Media quarters, facilities and equipment. Basic principles of organization and administration of media programs in elementary and secondary schools.

EDL 613. MATERIALS FOR CHILDREN (4)
Examination of materials for all institutions in which children are served: school media centers, public libraries, kindergartens, etc. Stress on selection aids, reviewing techniques, utilization. (Formerly EDL 514.)

EDL 614. TECHNICAL SERVICES IN LIBRARIES (4)
Principles of general library practice in technical services operating on the Emphasis on processes of cataloging and use of unabridged Dewey Decimal Classification. (Formerly EDL 515.)

EDL 615. CLASSIFICATION AND CATALOGING OF NON-BOOK MATERIALS (3)

EDL 616. ADVANCED CATALOGING (4)
PR: EDL 614 or CI. An examination of changing policies and procedures in the administration of acquisitions, cataloging, binding, photographic reproduction and related area. Analysis of research in the field.

EDL 617. BOOKS AND RELATED MATERIALS FOR YOUNG ADULTS (5)
Young adult materials for use in secondary school libraries, young adult sections of public libraries and other institutions serving youth. Equal emphasis upon 1) selection principles and bibliographic sources as well as upon 2) utilization in terms of service to the young adult. (Formerly EDL 519.)

EDL 618. PREPARING INSTRUCTIONAL MEDIA (4)
Fundamentals of preparing and using audiovisual as they relate to the Emphasis on processes. (Formerly EDL 523.)

EDL 619. DOCUMENTS AND SERIALS (4)
The nature of documents and serials, their reference and research value; techniques of acquisition, cataloging, organization, conservation and reference use.

EDL 620. FOUNDATIONS OF EDUCATIONAL TECHNOLOGY (4)
Traces historical development and the application of educational technology to school media services.

EDL 621. AUDIOVISUAL ADMINISTRATION (5)
PR: EDL 618 and EDL 607 or CI. Audiovisual administrative practices in school systems and junior colleges.

EDL 622. AUDIOVISUAL UTILIZATION (4)
Examination (and utilization) of non-print media. Characteristics of media equipment and paradigms of use.

EDL 624. ADVANCED STORYTELLING (4)
PR: CI or EDL 613. Building storytelling programs for school and public libraries or other educational institutions. Analysis of historical aspects, material suitable for use and audience reaction. (Formerly EDL 524.)

EDL 625. READING GUIDANCE PROGRAMS IN LIBRARIES AND CLASSROOMS (4)
Working with factors and forces influencing reading habits of children and youth; programs for teaching investigative and library skills; materials and methods for guidance of reading, listening and viewing.

EDL 629. LOCAL PRODUCTION OF RADIO AND CLOSED CIRCUIT TELEVISION (4)
Utilization and broadcasting techniques for educators. Stress will be placed on local school production, micro-teaching, and studio broadcasting.

EDL 630. INFORMATION SOURCES AND SERVICES IN THE HUMANITIES (4)
PR: EDL 606 or CI. Detailed consideration of the bibliographical and reference materials in the humanities with training and practice in their use for solving problems arising in the reference service.

EDL 631. INFORMATION SOURCES AND SERVICES IN THE SOCIAL SCIENCES (4)
PR: EDL 606 or CI. Characteristics of the social science disciplines and structure, concepts, methods of investigation. Understanding of social science reference tools as means of bibliographic control and as vehicles of research.

EDL 632. INFORMATION SOURCES AND SERVICES IN SCIENCE AND TECHNOLOGY (4)
PR: EDL 606 or CI. Study of representative reference sources in pure and applied sciences with equal attention given to typical problems encountered in scientific and technological reference service.

EDL 640. SEMINAR IN PUBLIC LIBRARIES (3)
PR: EDL 600 or CI. Identification of problems and critical examination of methods in administrative areas of technical, student, and teaching staff services, fiscal and legal responsibilities, staff organization and supervision in public libraries.

EDL 650. SEMINAR IN ACADEMIC LIBRARIES (3)
PR: EDL 600 or CI. Identification of problems and critical examination of methods in administrative areas of technical, student, and teaching staff services, fiscal and legal responsibilities, staff organization and supervision in academic libraries.

EDL 660. SEMINAR IN SPECIAL LIBRARIES (3)
PR: EDL 600 or CI. Identification of problems and critical examination of methods in administrative areas of technical and special service clientele; fiscal and legal responsibilities, staff organization and services in special libraries.

EDL 671. LIBRARY SYSTEMS PLANNING (4)
Applications of data processing technology to automation of library files. Emphasis on applications of computer hardware and software to administrative, circulation, and ordering data, catalog and index production, serials records.

EDL 672. SEMINAR IN LIBRARY AUTOMATION (4)
Seminar in the application of data processing technology to libraries, information centers, and library networks. Emphasis on operational systems.

EDL 690. TECHNIQUES FOR TEACHING IN THE SCHOOL MEDIA CENTER (4)
Methods and techniques pertinent to working with students and teachers in the school media program. To be taken concurrently with EDL 609 or CI.

EDL 691. INDEPENDENT STUDY (1-5)
PR: 20 hours earned in program and consent of adviser. (Formerly EDL 681.)

Measurement—Research—Evaluation (EDQ)

FOR GRADUATE STUDENTS ONLY

EDQ 701. CRITICAL ISSUES IN EDUCATIONAL MEASUREMENT AND EVALUATION (4)
A consideration of major issues relevant to the theory and application of measurement and evaluation. Topics include: culture-faire testing, accountability, normative vs. criterion measures and socio-political issues.

EDQ 702. ADVANCED MEASUREMENT-COGNITIVE AREA (4)
PR: EDF 605. Measurement, assessment theory and procedures appropriate to the "Cognitive Domain," i.e., intellectual abilities, aptitudes, achievements, skills. (Formerly EDQ 601.)
EDQ 703. ADVANCED MEASUREMENT- AFFECTIVE AREA
Measurement, assessment theory and procedures appropriate to the affective domain, i.e., feelings, attitudes, interests, personal characteristics. (Formerly EDQ 603.)

EDQ 705. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH I
Application of statistical techniques to the study of education problems: Tests of significance and confidence intervals, analysis of variance (one-way factorial), correlation and linear regression. (Formerly EDQ 605.)

EDQ 707. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH II
PR: EDQ 705. Application of statistical techniques to the study of educational problems: Multiple correlation and regression, Introductory Factor Analysis and selected non-parametric techniques. (Formerly EDQ 607.)

EDQ 708. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH III
PR: EDQ 707. Application of statistical techniques to the study of educational problems: Trend analysis, analysis of variance models and expectation of mean squares; analysis of covariance; method of least squares; Bayesian statistics (introduction). (Formerly EDQ 608.)

EDQ 709. DESIGN OF EXPERIMENT-PRODUCT RESEARCH IN EDUCATION
PR: EDQ 708. Basic Experimental design theory and models appropriate for education. (Formerly EDQ 609.)

EDQ 711. DESIGN OF DESCRIPTIVE-PROCESS RESEARCH
PR: EDQ 708. Theory and procedures for conducting descriptive research in education. (Formerly EDQ 611.)

EDQ 713. APPLICATION OF COMPUTER LANGUAGE AND PROCEDURES IN EDUCATION
Development of understanding and technical skill in relation to computer and data processing approaches to solution of educational research, and administrative problems. Training in use of Fortran as a programming language. (Formerly EDQ 613.)

EDQ 720. RESEARCH-BASED PLANNING EVALUATION AND DEVELOPMENT IN EDUCATION
Introduction to systematic planning and development procedures including needs assessment, proposal development, evaluation design and process engineering. Emphasis placed on analysis of evaluation models and theory. (Formerly EDQ 620.)

EDQ 721. A BASIS FOR PLANNING AND DEVELOPMENT IN EDUCATION
An introduction to systems theory and techniques emphasizing application to selected problems and situations in education. Development of competence in applying PERT, GANTT, Mission-Function-Task, and Modeling procedures. (Formerly EDQ 621.)

Music Education (EDM)

LOWER LEVEL COURSES
EDM 215. THEORETICAL BASES OF MUSIC EDUCATION
The course is designed to investigate music education practices in the schools. It provides the student with experiences and information early in his academic career which will enable him to determine his commitment to professional music education.

EDM 380. CHORAL MATERIALS PRACTICUM
PR: CI. A study of choral materials, in a laboratory setting, appropriate to elementary and secondary school music programs. Course content will change each quarter. May be repeated for a total of 6 hours credit.

EDM 390. ORCHESTRAL MATERIALS PRACTICUM
PR: CI. A study of orchestra materials, in a laboratory setting, appropriate to elementary and secondary school music programs. Course content will change each quarter. May be repeated for a total of 3 hours credit.

EDM 415. MUSIC IN THE ELEMENTARY SCHOOL
(Formerly EDM 435.)

EDM 416. FOUNDATIONS OF INSTRUMENTAL MUSIC
PR: CI, Junior Standing. Introduction to the foundations of instrumental music instruction in the elementary and middle school.

EDM 417. CLASSROOM MUSIC IN THE SECONDARY SCHOOL
PR: CI. Development and implementation of methods and techniques for teaching music to the student not participating in secondary school music performing groups. (Formerly EDM 437.)

EDM 418. INSTRUMENTAL MUSIC IN THE SECONDARY SCHOOLS
PR: CI, Junior Standing. Development and implementation of methods and techniques for teaching secondary school instrumental music. (Formerly EDM 433.)

EDM 419. CHORAL METHODS IN THE SECONDARY SCHOOL
PR: CI, Junior Standing. Development and implementation of methods and techniques for teaching secondary school choral music. (Formerly EDM 439.)

FOR GRADUATE STUDENTS ONLY
EDM 601. TECHNIQUES OF RESEARCH IN MUSIC EDUCATION
Professional bibliography and individual research projects.

EDM 603. MUSIC SUPERVISION AND ADMINISTRATION
The music curriculum in relation to the total school program; staff and budgetary needs.

EDM 614. VOCAL MATERIALS AND CONDUCTING
A study of materials appropriate for use in vocal groups. Emphasis is given to vocal materials appropriate for use in secondary schools.

EDM 617. INSTRUMENTAL MATERIALS AND CONDUCTING
A study of materials appropriate for use in instrumental groups. Emphasis is given to instrumental materials appropriate for use in secondary schools.

EDM 633. CURRENT TRENDS IN SCHOOL INSTRUMENTAL MUSIC
New materials, equipment, techniques of teaching and recent historical trends in instrumental music.

EDM 635. CURRENT TRENDS IN SCHOOL VOCAL MUSIC
New materials, equipment, techniques of teaching and recent historical trends in vocal music.

Natural Science—Mathematics Education (EDN)

UPPER LEVEL COURSES
EDN 425. NEW TRENDS IN TEACHING THE PHYSICAL SCIENCES
Physical Science Study Committee Physics, Chemical Education

†Each class meets as a performing group. Score reading, conducting, organizational procedures, historical relationships and methods at the appropriate grade levels. Teaching techniques concerning the presentation of elements of theory, general music, and literature.
EDN 616. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS I
PR: 18 quarter hours of mathematics or CI. Development of strategies and materials for teaching mathematical concepts and skills appropriate to pre-secondary school years.

EDN 617. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS II
PR: EDN 616. Continuation of EDN 616.

EDN 618. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS III
PR: EDN 617. Continuation of EDN 616-617.

EDN 621. TEACHING OF HIGH SCHOOL ALGEBRA
PR: B.A. in mathematics or certification in secondary mathematics. Philosophy, content, new trends, and methods of teaching beginning, intermediate, and advanced high school algebra.

EDN 622. TEACHING OF HIGH SCHOOL GEOMETRY
PR: B.A. in mathematics or certification in secondary mathematics. Philosophy, content, new trends, and methods of teaching high school geometry.

EDN 637. CURRENT TRENDS IN SECONDARY MATHEMATICS EDUCATION
Curricular patterns and instructional practices in secondary mathematics.

EDN 639. CURRENT TRENDS IN SECONDARY SCIENCE EDUCATION
PR: Bachelor’s degree with major in science area; certification in secondary science, or CI. Curricular patterns and instructional practices in secondary science.

EDN 641. CASE STUDIES IN SCIENCE
Case studies from the Natural Science with implications for science teaching.

EDN 651. TEACHING SECONDARY SCHOOL PHYSICAL & EARTH SCIENCES
PR: CI. Effective use and production of instructional materials in the physical and earth sciences. Interrelation of philosophy, materials and classroom practices.

**Physical Education for Teachers (EDP)**

**LOWER LEVEL COURSES**

**EDP 255. FIRST AID**
Meets the American Red Cross certification requirements in standard and advanced first aid.

**UPPER LEVEL COURSES**

**EDP 311. SEMINAR AND FIELD EXPERIENCE IN PHYSICAL EDUCATION**
Students conduct a physical education program for primary grade students and time is spent teaching in an elementary school which provides a variety of experiences designed to lead students to an understanding of children and how they learn in the elementary school. (S/U only.)

**EDP 312. HUMAN KINETICS I**
The development and integration of the neuromuscular and the associate sensory systems as they affect motor and perceptual-motor performance. The physiology of muscular contraction, the accompanying immediate changes in the cardiorespiratory systems, and the permanent physiological changes resulting from exercise.

**EDP 313. MOVEMENT EDUCATION THEORY AND APPLICATION I**
The philosophy, objectives, and analytical structure of movement education are studied. Application of concepts relative to the development of basic movement competence, including rhythm and dance activities are emphasized.

**EDP 314. INDIVIDUAL ASSESSMENT**
A personal evaluation of various factors related to the effective teaching of physical education. An individual profile that can be used for counseling purposes will be the final product of this course.

**EDP 321. SEMINAR AND FIELD EXPERIENCE IN PHYSICAL EDUCATION**
Elementary school physical education teaching experiences are provided for students. Seminars emphasize planning and teaching methodology. Health and recreation as they relate to elementary school children are studied.

**EDP 322. HUMAN KINETICS II**
The structure and function of the nervous, skeletal, and muscular systems of the human body as they contribute to

*Enrollment in these courses requires admission to the Physical Education Program.*
efficient movement; deviations in either structure or function in these systems and the role of exercise in rehabilitation.

**EDP 323. MOVEMENT EDUCATION THEORY AND APPLICATION II** (3)
Different styles of teaching are introduced relative to rhythmic dance and basic movement and manipulative skills leading to sports and gymnastics activities. Mechanical principles of human movement are stressed.

**EDP 331. SEMINAR AND INTERNSHIP IN PHYSICAL EDUCATION**
Physical education teaching experience is provided at various grade levels. Seminars are concerned with organization, evaluation, and extra-class activities. Individual teaching is analyzed and programmed.

**EDP 332. HUMAN KINETICS III** (4)
The mechanical laws of physics as they relate to movement within and of the human body and the projection of objects in throwing, hitting, and kicking. Efficiency of human movement through sound body mechanics.

**EDP 333. MOVEMENT EDUCATION THEORY AND APPLICATION III** (3)
The application of principles of space, time, force, and flow of human movement to the development of children through gymnastics. The bio-mechanical aspects of performance are also analyzed. Open to program majors only.

**EDP 365. AQUATICS** (3)
Includes analysis and methodology of teaching swimming skills, conducting class activities, and the organization and conducting of aquatic programs in the school and the community.

**EDP 411. SEMINAR AND FIELD EXPERIENCE IN PHYSICAL EDUCATION** (5)
Student teaching or field experiences and seminars relating to physical education are offered. Field experience projects may also be taken with faculty approval.

**EDP 412, 422, 432. APPLIED HUMAN KINETICS** (4,4,4)
A three course sequence which stresses the biomechanical analysis, motoric learning, the teaching techniques of dance, and the skills and strategies common to a number of individual and team sports.

**EDP 421. SEMINAR AND INTERNSHIP IN PHYSICAL EDUCATION** (5)
PR: Taken concurrently with EDP 431. Supervised teaching experience at either the junior or senior high school level. Emphasis is placed on individualization of instruction and continued on structuring meaningful activities in the psychomotor, cognitive, and effective domains. A humanistic process is the common thread throughout.

**EDP 422. APPLIED HUMAN KINETICS** (See EDP 412.) (4)

**EDP 431. SEMINAR AND INTERNSHIP IN PHYSICAL EDUCATION** (5)
Supervised teaching experience at either the junior or senior high school level. Emphasis is placed on understanding the adolescent student and how teaching behavior influences the teaching/learning process. Innovations in physical education are explored.

**EDP 432. APPLIED HUMAN KINETICS** (See EDP 412.) (4)

**EDP 458. SCIENTIFIC BASIS OF COACHING** (5)
The application of principles from exercise physiology, kinesiology, and psychology to competitive athletics. (Formerly EDP 558.)

**EDP 459. ATHLETIC TRAINING** (3)
PR: Cl. Principles and techniques of conditioning athletes for competition; prevention and care of injuries in physical education and athletic activities.

**EDP 460. HEALTH EDUCATION PROJECT** (5)
PR: Cl. A practicum in health education through field experiences with official and voluntary health agencies.

**EDP 468. COACHING OF SWIMMING** (3)
Methods of organizing and coaching a competitive swimming team.

**EDP 469. COACHING OF FOOTBALL** (5)
Theory and practice of the fundamental techniques, organizational problems and strategy involved in coaching football.

**EDP 478. COACHING OF WRESTLING** (4)
Theory and practice of the fundamental techniques, organizational problems and strategy involved in coaching wrestling.

**EDP 479. COACHING OF SOCCER** (3)
Theory and practice of the fundamental techniques, organizational problems and strategy involved in coaching soccer.

**EDP 486. COMMUNITY RECREATION** (4)
Introduction to recreational outlets in the community and the administrative problems confronting recreational playground leaders and directors of community recreational programs.

**EDP 488. COACHING OF TRACK AND FIELD** (4)
Theory and practice of the fundamental techniques, organizational problems and strategy involved in coaching track.

**EDP 489. COACHING OF BASKETBALL** (3)
Theory and practice of the fundamental techniques, organizational problems and strategy in coaching basketball.

**EDP 499. COACHING OF BASEBALL** (3)
Theory and practice of the fundamental techniques, organizational problems and strategy involved in coaching baseball.

**FOR GRADUATE STUDENTS ONLY**

**EDP 600. PROFESSIONAL ASSESSMENT** (4)
Selected readings of current trends in physical education; discussion of philosophies of teaching; and individual appraisal of knowledge, values, attitudes, and professional competencies.

**EDP 610. BIO-KINETICS OF HUMAN MOVEMENT** (4)
Integration of basic kinesiological foundations applied to teaching physical education. Specific topics include: physical growth and neuro-muscular development, role of neuromuscular mechanisms in motor performance, physical principles of human movement and the effects of exercise on the muscular and cardio-respiratory systems.

**EDP 611. SPECIALIZED STUDY IN BIO-KINETICS OF HUMAN MOVEMENT: (SUBJECT)** (1-4)
Will provide in-depth study in specific areas related to neurological, physiological, and mechanical principles of human movement.

**EDP 620. SOCIO-PSYCHOLOGICAL ASPECTS OF HUMAN MOVEMENT.** (4)
Involves the psychological and sociological implications of movement to historical and contemporary man. Emphasis on psycho-motor learning, movement behavior, physical self-concept, role of movement in society and values and attitudes held toward movement.

**EDP 621. SPECIALIZED STUDY IN SOCIO-PSYCHOLOGICAL ASPECTS OF HUMAN MOVEMENT: (SUBJECT)** (1-4)
Will provide in-depth study in specific areas related to sociological and psychological principles of human movement.

**EDP 630. CURRICULUM AND INSTRUCTIONAL PROCESS IN PHYSICAL EDUCATION** (4)
Application of learning theory and education innovations, study of structure of subject matter and styles of teaching and investigation of the nature of the learner as these relate to teaching physical education. Fieldwork may be a requirement of this course.

†Enrollment in these courses requires admission to the Physical Education Program.
EDP 631. SPECIALIZED STUDY IN CURRICULUM AND INSTRUCTIONAL PROCESS IN PHYSICAL EDUCATION: (SUBJECT) (1-5)
Will provide in-depth study in specific areas related to the teaching-learning process of physical education.

EDP 640-641. PHYSICAL EDUCATION FOR THE HANDICAPPED I & II (5,5)
This sequential course is concerned with the motor performance and physical fitness of neurologically handicapped individuals and the unique problems of motor skill learning found in children and youth with visual, auditory, speech or orthopedic handicaps. Study includes field experiences which apply knowledge related to psycho-educational characteristics; planning, conducting, and evaluating individualized programs of special physical education; and review of relevant literature.

EDP 650. RESEARCH IN PHYSICAL EDUCATION (4)
Emphasis will be directed toward planning, conducting, and interpreting research in physical education. The function of research in improving programs as well as the technical aspects of research designs appropriate to physical education are included for study.

EDP 651. RESEARCH PROJECT IN PHYSICAL EDUCATION (1-6)
In-depth research study of selected topics concerning human movement. Topics will vary according to needs and interests of students. May be repeated for credit.

Reading Education (EDR)

UPPER LEVEL COURSES

EDR 407. READING IN SECONDARY CONTENT AREAS (2)
PR: CI and content area PR or CR. Provides basic instruction in phonics, word recognition, readability, interest, corrective procedures, reading behavior, comprehension, etc. Offered only in conjunction with special content reading courses. (Formerly EDR 507.)

EDR 408. READING IN MIDDLE SCHOOLS (4)
This course is for new teachers planning to, or currently teaching in a middle school. Students will study reading as it relates to their particular subject matter area. (Formerly EDR 508.)

EDR 409. CURRENT TRENDS IN READING IN THE SECONDARY SCHOOL (4)
Survey of secondary, college, and adult reading practices, problems, and research. Work with students at commensurate level required. (Formerly EDR 509.)

EDR 430. CORRECTIVE READING FOR THE CHILD (4)
PR: EDE 409 or equivalent. Procedures for meeting individual differences through classroom organization, differentiated instruction and selective use of materials. (Formerly EDR 530.)

FOR GRADUATE STUDENTS ONLY

EDR 610. READING IN SECONDARY AND HIGHER EDUCATION (4)
PR: CI and Level II standing; EDR 407, 408, 409, and EDE 409 or equivalent training. The course is designed for graduate students and in-service teachers with appropriate BA degrees, who need and/or desire more knowledge beyond an introductory level about reading at the Secondary (7-12) and higher (Community College, University) levels. Students will study reading as it applies to their discipline and their level. Work with students and a research paper required. Not for undergraduates nor to be used as a first course in Reading.

EDR 630. CORRECTIVE READING FOR CLASSROOM TEACHERS (4)
PR: EDE 409 and EDR 430. Use of diagnostic and prescriptive procedures with individual and group reading instruction. (Formerly EDR 530.)

EDR 631. DIAGNOSIS OF READING DISABILITIES (4)
PR: EDE 609, EDF 605. Causes of reading disability; techniques and materials in diagnosis of reading problems, including telebinocular and audiometer screening. Diagnoses of reading disabilities are required.

EDR 632. TECHNIQUES OF REMEDIAL READING (4)
PR: EDE 609, EDF 605, EDR 409, and EDR 631. Materials and methods in remediation of moderate to severe reading disability cases. Supervised individual tutoring and in-depth evaluation and use of materials.

EDR 633. PRACTICUM IN READING (4)
PR: EDE 609, EDF 605, EDR 409, EDR 631, and EDR 632. Remediation of severe reading disability cases, tutoring of individuals and small groups, interview techniques, preparation of case reports.

EDR 634. CURRICULUM AND SUPERVISION PROBLEMS IN READING (4)
PR: EDE 609, EDF 605, EDR 409, EDR 631, and EDR 632. Planning and administering programs and preparation as consultants in reading. Intensive work on individual project required.

EDR 635. SURVEY OF READING RESEARCH (4)
PR: EDF 605 and EDF 607, most of EDR courses and CI. Course deals with research in reading—a review of research is conducted by student and presented in written form.

EDR 709. READING AS A SYMBOLIC PROCESS (4)
PR: EDR 409 or EDE 609. Advanced Graduate standing in Reading/Language Arts or CI. Examination and understanding of the relationship of the various perceptual, learning, affective and cognitive processes to the acquisition of reading competencies.

EDR 733. ADVANCED CLINICAL PRACTICUM IN READING (4-8)
PR: EDR 631, 632, 633, and EDF 617 or PSY 617 and Advanced Graduate standing in Reading/Language Arts. Clinical diagnosis and remediation of severe reading disability cases with emphasis on multi-disciplinary approach. Supervision of master students in the 631, 632, 633 sequence. May be repeated for a maximum of 8 hours.

Social Science Education (EDW)

UPPER LEVEL COURSES

EDW 410. COMMUNICATION SKILLS IN THE SOCIAL STUDIES (2)
PR: CI. Communication Skills in the Social Studies. Methods of dealing with reading problems in social studies. This course and EDR 407 satisfy the state certification requirement pertaining to secondary reading. (S/U only.)

EDW 461. TEACHING METHODS IN SECONDARY SCHOOL—SOCIAL STUDIES (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in social studies.

FOR SENIORS AND GRADUATE STUDENTS

EDW 508. TEACHING METHODS IN THE MIDDLE SCHOOL—SOCIAL STUDIES (4)
PR: Admission to Middle School Program or CI. Techniques of Instruction in Middle School Social Studies.

EDW 547. CRITIQUE OF SELECTED SOCIAL SCIENCE EDUCATION LITERATURE (4)
PR: Major in Middle School or Secondary Social Science or CI. An investigation into various selected readings in Social Science Education literature.

EDW 549. EVALUATION AND IMPLEMENTATION OF MEDIA IN SOCIAL STUDIES (4)
PR: Admission to the Middle School Program or CI. Techniques of evaluating and using various media in the Social Studies.
EDW 553. INSTRUCTIONAL PROBLEMS AND STRATEGIES IN SOCIAL STUDIES: ELEMENTARY, MIDDLE OR SECONDARY SCHOOL (4) 
PR: Admission to Middle School Program, Secondary Social Science, or CI. Investigation of problems confronted when teaching Social Studies in the elementary, middle or secondary school.

FOR GRADUATE STUDENTS ONLY

EDW 643. CURRENT TRENDS IN SECONDARY SOCIAL STUDIES (4) 
PR: EDW 461 or equivalent or CI. Curricular patterns and instructional practices in secondary social studies.

EDW 645. REVIEW OF RESEARCH IN SOCIAL SCIENCE EDUCATION (4) 
PR: EDF 303 or EDF 605, Graduate Students in Education, or CI. Investigation into and an evaluation of the research in Social Science Education.

EDW 655. ELEMENTARY SOCIAL STUDIES CURRICULUM (4) 
PR: Admission to College of Education or CI. Evaluation of past and present curriculum in Elementary Social Studies.

EDW 657. SECONDARY SOCIAL SCIENCE CURRICULUM (4) 
PR: Admission to College of Education or CI. Evaluation of past and present curriculum in Secondary Social Science.

EDW 659. SEMINAR IN SOCIAL SCIENCE EDUCATION (4) 
PR: EDF 303 or EDF 605, or CI. To increase general technological knowledge of graduate students in Social Science Education.

Speech Communication-English Education (EDT)

UPPER LEVEL COURSES

EDT 423. DIRECTING SPEECH ACTIVITIES IN THE SECONDARY SCHOOL (5) 
PR: 15 hours of speech communication courses or CI. Coaching and directing cocurricular activities in discussion, debate, oratory, theatre, oral interpretation, and extemporaneous speaking. Planning and supervision of tournaments, contests, and festivals. Observations required. (Formerly EDT 523.)

EDT 424. READING IN SPEECH COMMUNICATION INSTRUCTION (2) 
PR: EDR 407 or in conjunction with this course. Strategies and materials for teaching oral and silent reading in speech and theatre classes at the secondary school level. (Formerly EDT 524.)

FOR GRADUATE STUDENTS ONLY

EDT 621. CURRENT TRENDS IN TEACHING SPEECH COMMUNICATION (5) 
PR-CI. Curricular patterns; preparation of personnel; instructional materials, facilities and practices used in teaching speech communication.

EDT 622. SEMINAR IN THE HISTORY OF SPEECH COMMUNICATION IN EDUCATION (5) 
PR-CI. Studies in selected sources, critical writings, and research which have contributed to the development of speech communication as an academic discipline.

Vocational and Adult Education (EDV)

LOWER LEVEL COURSES

EDV 307. THE TEACHER IN A WORLD OF WORK (4) 
A study of educational efforts in preparing people for work, the relationship of a job to man’s life style, and the concept of education as a lifelong process.

UPPER LEVEL COURSES

EDV 353. ADMINISTRATIVE OFFICE MANAGEMENT (5) 
Functions of the business office to include systems and procedures, communications, records management, office employee behavior, controlling the work of the office, and principles of office applications. Also includes the methodology necessary for teaching these areas in either separate courses or integrated block programs.

EDV 361. BUSINESS AND OFFICE MACHINES (5) 
PR: Basic Typewriting. Instruction and practice on selected business and office machines to acquaint students with capabilities and limitations of the machines. Instruction and reading on teaching methodology for business and office.

EDV 406. ORGANIZATION AND COORDINATION OF COOPERATIVE PROGRAMS (4) 
A study of the purposes and processes used to organize, plan, direct, control, and evaluate cooperative programs.

EDV 407. PRINCIPLES OF ADULT AND VOCATIONAL EDUCATION (4) 
An overview of current policies and principles to include their historical, sociological and philosophical bases out of which principles of adult and vocational education have been accepted and implemented. (Formerly EDV 507.)

EDV 410. READING SKILLS IN ADULT AND VOCATIONAL EDUCATION (2) 
PR: EDR 407, or concurrent registration in EDR 407. Students will study reading and communication skills as they relate to their particular content areas in Adult and Vocational-Technical Education. This course, along with EDR 407, satisfies State certification requirement pertaining to secondary reading.

EDV 431. SUPERVISED FIELD EXPERIENCE: (Specialization) (1-8) 
PR: CI. Planned supervised functions in the area of specialization and co-ordinated with selected schools, government offices, social agencies, businesses and industries on site.

EDV 443. SPECIAL TEACHING METHODS: (Specialization) (5) 
Methods, techniques, and materials for skill development.

EDV 445. METHODS OF TEACHING: (Specialization) (4) 
Methods, techniques, and materials for instruction. This course will specialize in Diversified Cooperative Training.

EDV 461. OFFICE OCCUPATIONS PROCEDURES (5) 
PR: EDV 361, and Senior standing. This course is designed to integrate learnings from preceding business and office education courses. Applications involve actual and simulated office situations, problems, and evaluation. Emphasis is placed on the qualifications needed for efficient business office operations.

EDV 480. FACILITY DESIGN AND MANAGEMENT (4) 
Design and develop instructional facility floor plans consistent with modern and efficient methods of instruction as well as evaluate existing classrooms, laboratories, and shops. Selection and location of equipment. Review and prepare operational plans for the management of equipment, furniture, tools, and supplies as they relate to effective student learning.

FOR SENIORS AND GRADUATE STUDENTS

EDV 503. CURRICULUM CONSTRUCTION: (Specialization) (4) 
Planning and organizing an instructional program for the purpose of developing an occupational competency.

EDV 504. PREPARATION AND DEVELOPMENT FOR TEACHING (4) 
The development of selected instructional materials, use of

*Areal of specialization in these courses are: Adult Education, Business Education, Distributive Education, and Industrial Technical Education.*
new educational media, performance evaluation instruments, and counseling techniques.

EDV 505. THE ADULT LEARNER (4)
PR: EDF 305 or equivalent. Physiological and psychological changes in individuals throughout the adult life span and the implications which these changes have in learning capabilities of adults. A review of recent research on adult learning is also emphasized.

†EDV 506. PROGRAM MANAGEMENT: (Specialization) (4)
Organization, co-ordination, and budgeting of adult, cooperative, and special programs.

EDV 508. OCCUPATIONAL SAFETY AND HEALTH (OSHA) (4)
Planning and organizing safety and health course content to be included in occupational education programs in Florida. Content to be identified in and selected from Federal Registers, Department of Labor, Occupational Safety and Health Standards.

EDV 511. SCHOOL-COMMUNITY DEVELOPMENT (4)
An approach to identifying, assessing, and analyzing individual, institutional, and community needs, for the purpose of cooperative program planning, community involvement and public support.

FOR GRADUATE STUDENTS ONLY

EDV 605. ADULT BASIC EDUCATION (4)
An overview of adult basic education with emphasis on current issues and problems of curriculum and instruction in program development for culturally different adults.

EDV 621. INDIVIDUALIZED INSTRUCTION (4)
Attention is given to individualized instruction to include the special needs student, the slow learner, and the more capable student.

EDV 631. CURRENT TRENDS (4)
Historical information, issues, current trends, new dimensions and problems in the area of specialization.

ENGINEERING


Basic and Interdisciplinary Engineering Course Work (EGB)

EGB 101. GRAPHIC ANALYSIS I (3)
The theory and application of projective systems and related topics. Basic problems in engineering drawing. Purchase of drawing instruments and other necessary drafting supplies to be discussed at first class session. Lec-Lab.

EGB 102. GRAPHIC ANALYSIS II (3)

EGB 103. GRAPHIC ANALYSIS III (3)
PR: EGB 101. An elective course designed for students with limited background in pre-calculus mathematics necessary for graphical processes. Emphasis on graphical concepts of algebraic and trigonometric relationships.

EGB 104. GRAPHIC ANALYSIS IV (3)
Continuation of EGB 103.

EGB 105. ENGINEERING ORIENTATION (1)
The role of engineering in society, characteristics of different fields of engineering, required preparation for engineering careers, and techniques and approaches used by engineers in their profession. (S/U only.)

EGB 201. ENGINEERING PROBLEMS I (2)

EGB 204. ANALYSIS & COMPUTATION I (3)
Basic computer operation and programming concepts. Use of FORTRAN in solving engineering type problems.

EGB 208. INTRODUCTION TO ENGINEERING I (3)
To present an overview of Engineering, its role and its concepts. Experimental program; see adviser.

EGB 209. INTRODUCTION TO ENGINEERING II (3)
PR: EGB 208. Continuation of EGB 208. (Experimental program.)

EGB 301. ENGINEERING PROBLEMS II (2)
CR: MTH 352. Continuation of EGB 201.

EGB 302. ENGINEERING PROBLEMS III (2)
CR: MTH 353. Continuation of EGB 301.

†Areas of specialization in these courses are: Adult Education, Business Education, Distributive Education, and Industrial-Technical Education.
EGB 303. ENGINEERING PROBLEMS IV  

EGB 304. ANALYSIS & COMPUTATION II  
PR: EGB 204 or equivalent. Use of FORTRAN and WATFIV in solving engineering problems. Use of computer libraries.  
Structure and use of SIMSCRIPT in systems simulation.

EGB 306. ENGINEERING STATISTICS I  
(Formerly EGS 461.)

EGB 311. INTRODUCTION TO ELECTRICAL SYSTEMS I  

EGB 312 INTRODUCTION TO ELECTRICAL SYSTEMS II  
PR: EGB 311. Continuation of EGB 311.

EGB 313. INTRODUCTION TO ELECTRICAL SYSTEMS III  
PR: EGB 311. Continuation of EGB 311 or EGB 312.

EGB 321. THERMODYNAMICS I  

EGB 322. THERMODYNAMICS II  

EGB 323. TRANSFER OPERATIONS I  
PR: PHY 303, 305. Linear dynamic analysis of electrical, mechanical, pneumatic, hydraulic and thermal systems. Introduction to analog computers; LaPlace transformation. Block diagram representation, transient and frequency response. Lec.-Dem.

EGB 337. ENGINEERING VALUATION I  
PR: EGB 204. A study in analyzing the economic limitations imposed on engineering activities using basic models which consider: the time value of money.

EGB 340. SOLID MECHANICS I  

EGB 341. SOLID MECHANICS II  

EGB 342. MATERIALS ENGINEERING I  
PR: CHM 213, EGB 340. An introduction to structure and property relationships in engineering materials, i.e., metal, ceramic and polymer systems. Environmental effects on materials are also treated. Lecture.

EGB 343. BASIC FLUID MECHANICS  
PR: EGB 341. Fundamental and experimental concepts in ideal and viscous fluid theory; momentum and energy consideration, introduction to hydraulics, pipe flow. Lecture.

EGB 344. DEFORMABLE BODIES  
PR: EGB 340. Stress, strain, Hooke’s Law; torsion, beam, column analysis; combined stresses; inelastic effects, limit design. Lec.-problem.

EGB 345. MATERIALS ENGINEERING II  
PR: EGB 342. Continuation of EGB 342.

EGB 346. COMPRESSIBLE FLOW  
PR: EGB 343. Compressible flow and free surface flow.

EGB 401. ENGINEERING ANALYSIS I  

EGB 405. INTRODUCTION TO LINEAR SYSTEMS  
PR: EGB 401. Study and application of matrix algebra, differential equations and calculus of finite differences.  
(Formerly EGS 541.)

EGB 481. PROFESSIONAL ENGINEERING SEMINAR I  
PR: CI. A lecture-discussion seminar on modern trends in the engineering profession.

EGB 483. PROFESSIONAL ENGINEERING SEMINAR II  
PR: CI and Senior standing. An examination of current engineering and related problems facing the graduating senior.  
(S/U only.)

EGB 501, 502, 503, 504, 505. ENGINEERING ANALYSIS II, III, IV, V, VI  
PR: CC or MTH 401. A five course sequence. (1) Ordinary differential equations with emphasis on series solutions and numerical methods. (2) Vector analysis, partial differential equations, boundary value problems and orthogonal functions. (3) Functions of a complex variable with applications. (4) Selected Topics.

EGB 601. ENGINEERING ANALYSIS VII  
PR: CC. Application of applied mathematics to the study of linearized dynamic systems and networks; state space; stability theory; extensions to discrete and non-linear systems.

EGB 610. SCIENTIST IN THE SEA I  
PR: CI and diver certification (NAVI or equiv.) Hyperbaric Operations; the basic principles, physiology and psychology involved in submarine hyperbaric operations, inside and outside habitats. Communication and life support is also treated extensively. Lec.-lab. (Also listed as MSC 610.)

EGB 611. SCIENTIST IN THE SEA II  
PR: CI and diver certification (NAVI or equiv). Marine Sciences; an extensive discussion of research equipment and techniques for underwater operations in the Marine Sciences presented by practicing research workers in the field. Lec.-lab. (Also listed as MSC 611.)

EGB 612. SCIENTIST IN THE SEA III  
PR: CI and diver certification (NAVI or equiv). Underwater Engineering; the ocean as a constraint for structures and devices. Factors involved in the planning and design of underwater operations and experimental devices. Lec.-lab.  
(Also listed as MSC 612.)

EGB 681. DIRECTED RESEARCH  
PR: GR. Master’s level. Repeatable. (S/U only.)  
(credit varies)

EGB 694. GRADUATE INSTRUCTION METHODS  
(1-5) Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

EGB 695. GRADUATE RESEARCH METHODS  
PR: EGB 342. Continuation of EGB 342. Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

EGB 699. THESIS: MASTER’s  
Repeatable. (S/U only.)  
(credit varies)

EGB 781. DIRECTED RESEARCH  
PR: GR. Ph.D. level. Repeatable. (S/U only.)  
(credit varies)
EGE 799. DISSERTATION: DOCTORAL (credit varies)
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

Electrical and Electronic Systems (EGE)

EGE 301. LABORATORY 1 (1)
PR: EGE 311.

EGE 302. LABORATORY 2 (1)
PR: EGE 312.

EGE 303. LABORATORY 3 (1)
PR: EGE 301.

EGE 310, 410. NETWORK ANALYSIS AND DESIGN I, II (3,3)

EGE 320, 420 ELECTRONICS I, II (3,3)
PR: EGE 312. A second course in the physical principles of electronic devices with emphasis on semi-conductor electronics. Includes the analysis and design of amplifiers and switching circuits.

EGE 330, 430. FIELDS AND WAVES I, II (3,3)
PR: PHY 305, 306, EGB 401. A basic introduction to electromagnetic field theory, including static and dynamic electromagnetic fields.

EGE 361. INTRODUCTION TO COMPUTER SCIENCE I (2)
PR: MTH 351 or equivalent and EGE 362. CR: EGE 364. A second course in the physical principles of electronic devices with emphasis on semi-conductor electronics. Includes the analysis and design of amplifiers and switching circuits.

EGE 362. COMPUTER SCIENCE LABORATORY I (1)
CR: EGE 361. Laboratory for implementation of algorithms in a general purpose computer language.

EGE 363. INTRODUCTION TO COMPUTER SCIENCE II (2)
PR: MTH 351 or equivalent and EGE 362. CR: EGE 364. A second course in the physical principles of electronic devices with emphasis on semi-conductor electronics. Includes the analysis and design of amplifiers and switching circuits.

EGE 364. COMPUTER SCIENCE LABORATORY II (1)

EGE 404. LABORATORY 4 (1)
PR: EGE 302; CR: EGE 420

EGE 405. LABORATORY 5 (1)
PR: EGE 302; CR: EGE 421

EGE 406. LABORATORY 6 (1)
PR: EGE 302; CR: EGE 430

EGE 407. ELECTRICAL MEASUREMENTS (2)
PR: EGE 310. Techniques and principles of electronic measurement. (Formerly EGE 548.)

EGE 408. ELECTRICAL MEASUREMENTS LABORATORY (1)
CR: EGE 407. (Formerly EGE 549.)

EGE 410. SEE EGE 310.

EGE 411. LINEAR SYSTEMS ANALYSIS (3)
PR: EGE 410. Provides further study in the analysis of linear networks and systems. Includes time and frequency domain points of view, LaPlace, Fourier and superposition integrals.

EGE 420. SEE EGE 320.

EGE 421. COMMUNICATION CIRCUITS (3)
PR: EGE 420. Provides further study in electronic circuits. Includes oscillator, modulator, and detector analysis and design.

EGE 425. COMMUNICATION ENGINEERING (3)
PR: EGE 421. System considerations of electronic circuits; radio propagation; antennas; transmitters and receivers.

EGE 426. COMMUNICATIONS LABORATORY (1)
CR: EGE 425. Experiments in amplitude modulation, frequency modulation, pulse communications and data transmission.

EGE 430. SEE EGE 330.

EGE 432. DISTRIBUTED NETWORKS (3)
PR: EGE 330, EGE 410. Transmission lines standing waves, impedance, waveguides.

EGE 435. SYSTEMS APPROACH TO BIOMEDICAL ENGINEERING I (3)
PR: EGE 410 or CC. Characterization of physiological systems, principles of modeling, system properties. Transfer function description, physiological feedback, effects of non-linearities. (Formerly EGS 432.)

EGE 436. SYSTEMS APPROACH TO BIOMEDICAL ENGINEERING II (3)

EGE 440. LINEAR CONTROL SYSTEMS (3)
PR: EGB 325, EGE 420. Introduction to analysis and design of linear feedback control systems. Covers block diagram, flow charts, Bode, Nyquist and root locus techniques.

EGE 441. CONTROL LABORATORY (1)
CR: EGE 440.

EGE 444. LOGIC DESIGN (3)
PR: EGE 312. Non-majors may enroll with the consent of the Chairman. Binary number system; truth functions; Boolean algebra; canonical forms; minimization of combinational logic circuits; logic circuits in computers.

EGE 445. LOGIC LABORATORY (1)
CR: EGE 444.

EGE 446. MICROPROCESSOR PRINCIPLES AND APPLICATIONS (3)

EGE 447. MICROPROCESSORS LABORATORY (1)
CR: EGE 446. Laboratory for Microprocessor use and evaluation.

EGE 450. MICROELECTRONICS ENGINEERING (3)

EGE 451. MICROELECTRONICS LABORATORY (1)
CR: EGE 450.

EGE 460, 462, 464. ELECTROMECHANICS I, III, III (3,3,3)

EGE 461, 463, 465. ELECTROMECHANICS LAB 1, 2, 3 (1,1,1)
CR: EGE 460, 462, 464, respectively.

EGE 470. COMPUTER SYSTEMS (3)
PR: EGE 304, MTH 353 or CC. Linked course with EGE 471. Principles of computer organization, machine and assembly language programming.

EGE 471. COMPUTER SYSTEMS LAB (1)
PR: EGE 304, MTH 353 or CC. Linked course with EGE 470. Computer systems and programming laboratory.

EGE 472. INTRO TO SYSTEMS PROGRAMMING (3)
PR: EGE 470. Introduction to systems programming, design of assemblers, loaders, linking, data structures and operating systems.

EGE 473. PROGRAMMING LANGUAGES (3)
PR: EGE 470. An introduction to programming languages, syntax and semantics, properties of algorithmic languages, binding times, arithmetic, string handling, data structures, list processing, translation.
EGE 480, 481, 482. SPECIAL ELECTRICAL TOPICS I, II, III
PR: CC (1-4 each)

EGE 490. ENGINEERING ANALYSIS FOR COMPUTER SCIENCE II
PR: CC or MTH 401. Numerical solutions of ordinary differential equations through series and numerical methods.

EGE 491. ENGINEERING ANALYSIS FOR COMPUTER SCIENCE III

EGE 492. SWITCHING THEORY
PR: EGE 444. Elements of sequential machine theory including minimization methods.

EGE 493. INTRODUCTION TO DISCRETE STRUCTURES (3)
PR: EGE 444. Introduction to set algebra, propositional logic and finite algebraic structures as they apply to computers.

EGE 494. COMPUTER ORGANIZATION (3)
PR: EGE 444. The structural organization of digital computers; control, data operations, I/O, memory. Functional description of their behavior.

EGE 495. MINICOMPUTER LABORATORY (1)

EGE 498. COMPUTER SCIENCE PROJECT (3)
Projects intended to develop individual interests and abilities in computer science involving either computer hardware or software aspects of a well defined proposal.

EGE 499. DESIGN PROJECT (3)
PR: Senior standing. An individual or team project involving the design of an electrical component or system. Required of all electrical seniors.

EGE 520. PULSE CIRCUIT PRINCIPLES (3)
PR: EGE 411, 421. An introduction to the analysis and design of pulse and timing circuits with applications.

EGE 530. UHF PRINCIPLES (3)
PR: EGE 411, 421, 430. A study of tubes, devices and circuits peculiar to systems which operate at ultra high and super high frequencies.

EGE 531. UHF LABORATORY (1)
CR: EGE 530.

EGE 540. NONLINEAR CONTROL SYSTEMS (3)

EGE 541. CONTROL LABORATORY (1)
CR: EGE 540.

EGE 542. SEQUENTIAL CIRCUITS (3)
PR: EGE 444. The design of switching circuits with inputs that are functions of time is carried from a word description through a minimum state realization using flip-flops, logic gates and delay elements.

EGE 544. DIGITAL COMPUTERS (3)
PR: EGE 444. Digital arithmetic; computer subsystems, arithmetic units; control units; memory units; general purpose computers.

CR: EGE 544.

EGE 546. DIGITAL SIGNAL PROCESSING TECHNIQUES (3)
PR: EGE 411 or CC. Techniques of real time statistical analysis of signals, signal conditioning and enhancement. Design of digital networks. (Formerly EGB 523.)

EGE 547. DISCRETE STRUCTURES FOR DIGITAL SYSTEMS (3)
PR: EGE 444. Set algebra, basic algebraic structures in computers. Boolean algebra, propositional logic, and graphs. Applications to computers.

EGE 560. POWER SYSTEMS ANALYSIS (3)
PR: CC. Analysis techniques for AC power systems.

EGE 562. COMPUTER ANALYSIS OF POWER SYSTEMS (3)
PR: CC. Review of Fortran programming, matrix algebra, network formulation, short circuit studies, simulation of algebraic equations, load flow studies, numerical solution of differential equations, transient stability studies. Strong emphasis on techniques adaptable to digital computer studies, programs will be written and run on the IBM 360/65.

EGE 570. TOPICS IN COMPUTERS AND PROGRAMMING (4)
PR: CC. Machine organization, assembly and machine language, data structures, systems programming, operating systems.

EGE 573. IMAGE PROCESSING BY COMPUTERS (3)
PR: EGE 411 or CC. Two dimensional convolution and system functions. Fourier transform in two dimensions. Digitization of two dimensional signals, sampling theorems, band-limited signals. Image processing by computers. Applications of image processing. (Formerly EGS 525.)

EGE 580, 581, 582. SPECIAL ELECTRICAL TOPICS, I, II, III (1-3 each)
PR: CC.

EGE 585. ENGINEERING SEMINAR (1)
PR: CC.

EGE 599. RESEARCH OR DESIGN (1-9)
PR: CC (S/U only.)

EGE 610, 611. ADVANCED CIRCUIT THEORY I, II (3,3)
PR: CC. Network fundamentals; network characterization; frequency analysis; superposition integrals; signal-flow techniques; stability problems; real-and-imaginary relations.

EGE 612. NONLINEAR CIRCUITS (3)
PR: CC. Analytical and topological approaches to nonlinear circuits; nonlinear resonance; relaxation oscillations.

EGE 614, 615, 616. NETWORK SYNTHESIS, I, II, III (3,3,3)
PR: CC. Network functions; physical realizability; two-terminal network synthesis methods; frequency transformation; potential analogy; approximation problems; insertion-loss and transfer function synthesis.

EGE 620. INFORMATION THEORY (3)
PR: CC. Concepts of information, information channels, channel capacity, information sources and Shannon's fundamental theorem.

EGE 622. NOISE THEORY (3)
PR: CC. Electrical noise and signals through linear filters and electronic systems.

EGE 623. CODING THEORY I (3)
PR: CC. Error-correcting codes, algebraic block codes, linear codes and feedback shift registers. BCH codes and decoding methods.

EGE 624. CODING THEORY II (3)

EGE 626, 627, 628. THEORY OF COMMUNICATION I, II, III (3,3,3)
PR: CC. Physical basis and statistical representation of electrical noise; filtering, modulation, and de-modulation of signals corrupted by noise; correlation techniques and linear prediction; statistical estimation of signal parameter; optimum filters and receivers; ambiguity functions and inverse probability. Quantitative measure of information sources, noise channels and channel capacity; an introduction to error-correcting codes.

EGE 630, 631, 632. ELECTROMAGNETIC FIELDS AND WAVES I, II, III (3,3,3)
PR: CC. Electromagnetic theory from the engineering point of view, propagation and reflection of waves, guided waves, resonant cavities, antennas and radiation.
EGE 635. MICROWAVE GENERATION AND AMPLIFICATION (3)

EGE 636. ELECTRICAL LABORATORY (1)
CR: EGE 635.

EGE 637. MICROWAVE COMPONENTS (3)
PR: CC. A study of directional couplers, junctions, cavities and other passive microwave components including microwave integrated circuits.

EGE 638. MICROWAVE NETWORKS (3)
PR: CC. Scattering and transfer representations of n-ports. Odd and even mode theory. Wave filters.

EGE 639. ELECTRICAL PROPERTIES OF THIN FILMS (3)
PR: EGE 430 and EGE 450 or equivalent or CC. Electrical Properties of thin films as derived from Boltzmann’s transport equation. The growth of thin films. The fabrication of electrical circuits with thin films. Lecture supplemented by laboratory experiments and demonstrations.

EGE 640. DIGITAL CONTROL SYSTEMS (3)
PR: EGE 440 or CC. Sample-data and digital control processes.

EGE 641. RANDOM PROCESSES IN CONTROL SYSTEMS (3)
PR: EGE 440 or CC. Analysis and design of control systems subject to random inputs and disturbances.

EGE 642. MODERN CONTROL THEORY (3)
PR: EGE 440, 540, 640, 641 or CC. A study of modern control techniques including optimum and adaptive control.

EGE 643. OPTIMUM FILTERING AND IDENTIFICATION (3)
PR: CC or EGE 640. Estimation theory and development of the Kalman-Wiener filters for continuous and discrete-time systems. System identification through deterministic and stochastic approaches. Application to control and communication systems.

EGE 644. AUTOMATA THEORY I (3)

EGE 645. AUTOMATA THEORY II (3)

EGE 646. AUTOMATA THEORY III (3)
PR: EGE 645. Artificial languages, phase-structure grammars, operations on languages, decision problems, discrete value random processes, Markov processes, probabilistic sequential machines, non-deterministic sequential machines.

EGE 647. SIMULATION TECHNIQUES FOR ELECTRICALS (3)
PR: CC. Theory of simulation of systems characterized by lumped and distributed parameters.

EGE 648. ELECTRICAL MEASUREMENTS (2)
PR: CC. Advanced techniques and principles of electronic measurement.

EGE 649. MEASUREMENTS LABORATORY (1)
CR: EGE 648.

EGE 650, 651, 652. SOLID STATE ELECTRONICS I, II, III (3,3,3)
PR: CC. Theory of operation and application of circuits and devices.

EGE 653, 654. PRINCIPLES OF SEMICONDUCTOR DEVICE MODELING I, II (3,3)
PR: EGE 411, 430. A course sequence which emphasizes systematic methods for obtaining models which relate device physics to terminal behavior and which provide appropriate compromises between accuracy and simplicity.

EGE 655. COMPUTER DESIGN LANGUAGES (3)
PR: CC or EGE 544. Simulation languages for digital computer systems; APL, CDL and others. Simulation of elements, operations, sequences and of a complete digital computer.

EGE 656. DIGITAL ARITHMETIC METHODS (3)
PR: CC or EGE 544. Study of the number systems and the algorithms used for digital arithmetic computation with emphasis in their implementation, speed and reliability considerations.

EGE 657. COMPUTER ARCHITECTURE (3)
PR: CC. Theory of pattern recognition. Parametric and non-parametric methods, training theorems, unsupervised learning. Biomedical and other engineering applications. (Formerly EBG 631.)

EGE 658. PATTERN RECOGNITION THEORY (3)
PR: EGE 658. Computer implementation of pattern recognition problems. Feature reduction methods, CLAFIC and SELFIC techniques. Sequential methods. (Formerly EGB 632.)

EGE 660, 661, 662. ELECTRIC POWER SYSTEMS I, II, III (3,3,3)
PR: CC. Steady-state and transient analysis of interconnected power systems; power circuit protection; transient characteristic of apparatus.

EGE 663. LIGHTNING AND SURGE PROTECTION (3)
PR: CC. Methods of protection against overvoltages due to lightning. Ground wire shielding, systems and tower grounding, lightning arresters. Dynamic overvoltages, switching phenomena and system recovery voltages.

EGE 664. PROTECTIVE RELAYING OF POWER SYSTEMS (3)
PR: EGE 560, EGE 660 or CC. Fundamentals of instrumentation. Design and operation of protective schemes for equipment in generation, transmission, and distribution circuits. Analysis of abnormal system conditions requiring relay operation.

EGE 670. PULSE COMMUNICATIONS SYSTEM (3)
PR: CC. Sampling theory, pulse waveform generation and modulation. PAM, PWM, PPM, related multiplex systems, telemetry applications.

EGE 671. DATA TRANSMISSION (3)
PR: EGE 670. Quantization theory, binary coding systems, ideal binary transmission, on-off keying, FSK, PSK, PCM, applications.

EGE 672. DATA TRANSMISSION II (3)
PR: EGE 671. M-ary systems-MASK, MFSK, MPSK, orthogonal systems, multilevel and multistate coding, simplex codes, orthogonal and biorthogonal codes, polysignal systems, synchronization methods.

EGE 675. COMPUTER ARITHMETIC (3)
PR: CC. Representation of information and information structures in a computer system, linear linked lists, multi-linked lists, algorithms for list manipulation, stacks, deques and queues, trees and binary trees, tree traversing algorithms.

EGE 676. OPERATING SYSTEMS (3)
PR: CC. Operating systems functions and design, resource management, protection systems, process communication and deadlock.

EGE 677. PROGRAMMING LANGUAGES AND TRANSLATION (3)
PR: CC. Grammars and languages, symbols, strings, syntax,
EGE 678. CASE STUDIES IN INDUSTRIAL COMPUTER SYSTEMS  
PR: CC. A case study approach to the definition and implementation of industrial computer systems. The role of automation within the industrial concern. Design of systems in inventory, production control, and related areas. Directing the computer function and systems development. (Formerly EGS 628.)

EGE 679. SPECTRAL ANALYSIS BY COMPUTERS  
PR: CC. Introduction to time series analysis by computers. Discrete Fourier methods applied to time series, sample spectrum, cross spectrum, smoothing of spectral estimators, distribution properties. Application to physical, biological and environmental problems. (Formerly EGS 635.)

EGE 680. SPECIAL ELECTRICAL PROBLEMS  
PR: CC.

EGE 681. DIRECTED RESEARCH  
PR: GR. Master's level. Repeatable. (S/U only.)

EGE 682. SELECTED ELECTRICAL TOPICS  
PR: CC. (Formerly EGE 681.)

EGE 694. GRADUATE INSTRUCTION METHODS  
PR: CC. A case study approach to the definition and implementation of industrial computer systems. The role of automation within the industrial concern. Design of systems in inventory, production control, and related areas. Directing the computer function and systems development. (Formerly EGS 628.)

EGE 695. GRADUATE RESEARCH METHODS  
PR: CC. A case study approach to the definition and implementation of industrial computer systems. The role of automation within the industrial concern. Design of systems in inventory, production control, and related areas. Directing the computer function and systems development. (Formerly EGS 628.)

EGE 698. ADVANCED ENGINEERING SEMINAR  
PR: CC.

EGE 699. THESIS: MASTER'S  
PR: GR. Repeatable. (S/U only.)

EGE 781. DIRECTED RESEARCH  
PR: GR. Ph.D. level. Repeatable. (S/U only.)

EGE 799. DISSERTATION: DOCTORAL  
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

Energy Conversion and Mechanical Design (EGR)

EGR 311. THERMODYNAMICS III  
PR: EGR 322. The study of energy conversion processes and cycles as modified for optimization of capacity and efficiency. Applications include pumps, compressors, turbines, internal combustion engines, power and refrigeration cycles.

EGR 315. HEAT TRANSFER I  
PR: EGR 322. The basic laws of conduction, convection and radiation; analysis of the effect on heat transfer of thermal conductivity, emissivity, fluid transport properties and Reynolds's number. Lab.

EGR 326. DYNAMICS OF MECHANICAL SYSTEMS  
PR: PHY 301, MTH 352. Plane and angular motion; velocity and acceleration curves, velocities and accelerations in mechanisms, static and dynamic force analysis. Rolling and sliding contact pairs, cams, gear tooth action. Lab.

EGR 348. PHYSICAL MEASUREMENTS I  

EGR 350. ENERGY CONVERSION LABORATORY I  
CR: EGR 322. Introduction to engineering laboratory measurement with emphasis on the use of the library and the writing of technical reports. Experiments in the measurement of temperature, pressure, fluid flow, psychrometric properties of air, concentration, viscosity. Determination of mass-energy balances of simple systems. Preparation of formal engineering reports covering laboratory work.

EGR 411. THERMODYNAMICS IV  
PR: EGR 311 or CI. Introduction to Chemical Engineering Thermodynamics; Maxwell relations, properties of real substances and solutions, description of multicomponent systems in equilibrium. Qtr. III, IV.

EGR 413. FLUID MACHINERY I  
PR: EGR 343. Performance characteristics of pumps and fans; energy conversion in fluid machines; design of piping and duct systems; proper selection of pumps and fans for given fluid systems; analysis of system efficiency parameters; correlation of design predictions with experimental data.

EGR 416. ELECTRONIC EQUIPMENT COOLING  

EGR 417. FUELS AND COMBUSTION  
PR: EGR 322 or CI. A study of chemical reactions as sources of energy. Emphasis on the combustion characteristics of gaseous, solid and liquid fuels and equipment needed to safely and economically control combustion processes. Lab.

EGR 419. POWER PLANT ANALYSIS AND DESIGN  
CR: EGR 311, EGR 315. Factors affecting utility power production; daily load curves; estimation of future loads; economics of power generation; system efficiency as affected by the thermodynamic cycle, multiunit scheduling, and load variation; heat transfer regions in the steam generator; water treatment methods.

EGR 421. INTRODUCTION TO NUCLEAR ENGINEERING I  
PR: EGB 322 or CI. Introduction to nuclear energy conversion processes and cycles as modified for optimization of capacity and efficiency. Applications include pumps, compressors, turbines, internal combustion engines, power and refrigeration cycles.

EGR 424. REFRIGERATION AND AIR CONDITIONING  
CR: EGR 311. EGR 315. Application of thermodynamics, heat transfer and fluid flow to the design of systems for controlling our environment; heating and cooling load calculations; psychrometrics of air conditioning processes.

EGR 428. MACHINE ANALYSIS AND DESIGN  

EGR 429. MECHANICAL DESIGN I  
PR: EGR 326. EGR 428. Application of the principles of engineering mechanics, materials and manufacturing to the analysis and design of mechanical elements. Lab.

EGR 441. ANALOG AND DIGITAL SIMULATION I  
PR: EGR 325, EGR 348, or CI. The use of analog and digital computers as tools for the solution of engineering problems by means of simulation. Lab.

EGR 445. DYNAMIC RESPONSE OF ENGINEERING SYSTEMS II  

EGR 450. ENERGY CONVERSION LABORATORY II  
PR: EGR 350. Continuation of EGR 350 with emphasis on material and energy balances of mechanical and chemical systems and processes. Lab.

EGR 451. ENERGY CONVERSION LABORATORY III  
PR: EGR 450 or CI. Continuation of EGR 450. Emphasis on
Experiments involving momentum transfer of non-Newtonian fluids, heat conduction, and mass diffusion.

**EGR 453. MECHANICAL CONTROL**

(3)  
PR: EGB 311, 325. Analysis of devices for measurement and control. Transmitters, error detectors, controllers and final control elements. Block diagram representation.

**EGR 454. CONTROLS LABORATORY**

(1)  

**EGR 455. PROCESS CONTROL SYSTEMS I**

(3)  
PR: EGR 453 or CI. Analysis and design of process control systems. Consideration of typical control sensors and controllers as well as advanced process control techniques such as feedforward and ratio control. (Formerly EGR 553.)

**EGR 471. SEPARATION PROCESSES I**

(3)  
PR: MTH 303, CR: EGR 321. Introduction to the use of mass and energy balances and to chemical engineering thermodynamics through the description and analysis of separation processes (e.g., crystallization, distillation, osmosis, etc.) Qtr. I, II.

**EGR 472. TRANSPORT PHENOMENA**

(4)  
PR: EGR 311, or EGB 343, or EGR 473. A comparative study of transport phenomena with emphasis in the macroscopic applications of the balance and flux equations of momentum, energy, and mass.

**EGR 473. MASS TRANSFER**

(3)  
PR: EGR 472. Study of molecular and turbulent diffusion in fluids, diffusion in solids, mass transfer coefficients and interphase mass transfer. Qtr. II, III.

**EGR 474. SEPARATION PROCESSES II**

(3)  
PR: EGR 471 or CI. Emphasis on selection and design of separation processes. Familiarization with graphical techniques, group methods and other computational approaches used in design. Use of empirical correlations for size of equipment, efficiency of the process and quality of the separation. Qtr. III, IV.

**EGR 475. INDUSTRIAL CHEMISTRY**

(3)  
PR: CHM 332, EGR 474. A critical study of selected chemical process industries in order to give the student a better understanding of the direct application of basic chemical process principles.

**EGR 476. REACTING SYSTEMS I**

(3)  
PR: EGR 411. Design and control of homogeneous chemical reactors, effect of mixing, temperature and flow characteristics. Laboratory (3 contact hours). The student in this laboratory will be responsible for the safe and efficient manufacture of a "chemical" on pilot plant equipment. Lec.-lab.

**EGR 478. DESIGN AND CASE PROBLEMS**

(3)  
PR: EGR 474. This part of the course exposes the chemical engineering student to the design of a chemical plant or a major part of a process. The annual A.I.Ch.E. student contest design problems and typical design problems supplied by local industries will be used. CASE PROBLEMS: This part of the course stresses engineering "art." The word "case" connotes a specific engineering problem situation actually experienced by someone in the past or present. The student must generate his own individual approach to problem solving, benefitting from those of others in the class. (Formerly EGR 577.)

**EGR 481. SPECIAL TOPICS ENERGY CONVERSION I**

(1-4)  
PR: CC.

**EGR 482. SPECIAL TOPICS ENERGY CONVERSION II**

(1-4)  
PR: CC.

**EGR 501. INDUSTRIAL AIR POLLUTION CONTROL**

(4)  
PR: EGB 321. A basic course in the elements of large source air pollution and control as presented from the engineering viewpoint. Major units to be studied: Sources, Atmospheric Meteorology, Diffusion, Local Influences. Control Measures, Emergencies, Protection. Lec.-lab.

**EGR 511. INDUSTRIAL CHEMICAL ENGINEERING THERMODYNAMICS**

(4)  
PR: CI. Chemical thermodynamics applied to complex power cycles and reacting systems of industrial importance. Review of Maxwell relations, equations of state of real substances, and Gibbs Free Energy and Equilibria.

**EGR 513. FLUID MACHINERY II**

(3)  
PR: EGR 413. Performance characteristics of compressors and exhausters, vacuum pumps, and gas turbines; internal energy exchange and fluid flow paths; piping and ducting considerations; economic selection of proper equipment to match fluid and power system requirements; evaluation of off-design conditions.

**EGR 522. ACOUSTICS AND NOISE CONTROL**

(3)  
PR: CC. Fundamentals of sound propagation; sound power and intensity; psychoacoustics, industrial noise sources, methods of noise attenuation; community noise ordinances; instrumentation for noise measurement. Lec.-lab.

**EGR 523. MECHANICAL UTILITIES SYSTEMS**

(3)  
PR: EGR 413. Analysis and design of a building's mechanical systems for fire and lightning protection, air conditioning, water supply, waste and storm drains.

**EGR 526. ANALYSIS METHODS FOR MECHANICAL DESIGN**

(3)  

**EGR 527. ADVANCED DYNAMICS OF MACHINERY**

(3)  
PR: EGR 326. A continuation of undergraduate course and devoted to a more detailed study of velocities, accelerations and forces in machine parts having reciprocating, rotating and combined motion. A complete force analysis will be made of an internal combustion engine.

**EGR 528. MECHANICAL DESIGN II**

(3)  

**EGR 529. PROJECT DESIGN**

(3)  
PR: EGR 429. Correlation of previously acquired mechanical design experiences with a creative design project. Lec.-lab.

**EGR 533. MECHANICAL VIBRATION AND BALANCING**

(3)  
PR: EGB 341, 401. Transient and steady state vibration analysis of mechanical systems with lumped parameters. Dynamic balancing, vibration isolation and simulation of systems.

**EGR 535. LUBRICATION I**

(3)  
PR: EGB 343, 401. The theoretical basis of lubrication and hydrodynamic bearing theory. The study of lubrication requirements of different types of machines.

**EGR 551. INSTRUMENTAL ANALYSIS**

(4)  
PR: PHY 305, CHM 213. Instrumental Analysis. This course will deal with the engineering bases of a variety of sophisticated instrumental techniques for chemical analysis. Emphasis will be placed on the physical basis of the instrument and its design rather than on the interpretation of the analysis. Systems to be examined will include light and r.f. spectroscopy, mass spectrometry and methods which depend on various transport properties.

**EGR 554. HYDRAULIC CONTROL**

(3)  
PR: EGR 453 or CI. Hydraulic control system components and their effects on closed loop system performance. Lec.-lab.

**EGR 560. POWER UTILIZATION SYSTEMS**

(3)  
EGR 581. SPECIAL TOPICS ENERGY CONVERSION III (1-4)
PR: CC.

EGR 582. SPECIAL TOPICS ENERGY CONVERSION IV (1-4)
PR: CC.

EGR 611. THERMODYNAMICS OF FLUID FLOW (3)
PR: CC. Interrelationship of the equations of fluid motion and of thermodynamics for ideal gases; subsonic and supersonic gas flows, flows with friction and with heat transfer; supersonic nozzle design; parameters of fluid thrust.

EGR 612. ADVANCED THERMODYNAMICS (4)
PR: CC. Advanced treatment of the general equations of thermodynamics, principal equations of chemical reaction; the chemical potential and equilibrium; analysis of metastable states. Irreversibility and steady flow.

EGR 613. PROCESS HEAT TRANSFER I (3)

EGR 614. PROCESS HEAT TRANSFER II (3)
PR: EGR 315, EGR 613. Extended surface, longitudinal and radial fins, crossflow, finned passages, longitudinal high fin exchangers, radial flow fin exchangers, transverse high fin exchangers and compact heat exchangers.

EGR 615. HEAT TRANSFER II (3)
PR: EGR 315, EGB 401. Steady and unsteady heat transfer by conduction; one, two and three dimensional systems, numerical, graphical and analog methods, finite difference methods and periodic conduction heat flow. (Formerly EGR 515.)

EGR 616. HEAT TRANSFER II (3)
PR: EGR 315 and EGB 401 or CC. Radiative heat transfer. Radiation from black and "grey" bodies. Pure radiative heat transfer and in the presence of other modes of energy transfer. (Formerly EGR 615.)

EGR 617. ENERGY TRANSFORMATION AND STORAGE (3)
PR: CC. Analysis of direct energy conversion systems; photoelectric cells, thermocouples, fuel cells, thermionic converters, magnetohydrodynamic devices, solar energy cells, rectifiers, inverters, energy storage devices.

EGR 620. PROCESS DESIGN FOR ENVIRONMENTAL PROTECTION (4)
PR: EGR 478 or CI. Equipment and Process Design with emphasis on discharge control and environmental protection. Economic, and ecological constraints on optimum design.

EGR 622. ACOUSTICS AND NOISE CONTROL II (3)
PR: EGR 522. Continuation of EGR 522, acoustics and Noise Control I.

EGR 623. NOISE CONTROL DESIGN (1-3)
PR: EGR 522, EGR 622. Practical solutions to real noise problems occurring in local industries; students will be required to analyze a problem, design a "solution," and prepare and present a report to plant engineering personnel giving their analysis and recommendations; variable credit depending on complexity of problem.

EGR 624. AIR CONDITIONING SYSTEMS (3)
PR: EGR 413, EGR 424. Analysis and design of air conditioning systems; criteria for selection of central systems, unit air conditioners, or self-contained units; performance characteristics of single zone systems, with and without reheat, multi-zone systems, double duct and variable volume systems.

EGR 625. AIR CONDITIONING SYSTEMS DESIGN (3)
PR: EGR 424, EGR 624 or CI. Design of an air conditioning system from the concept stage to final plans and specifications, stressing the practical application of basic theory and knowledge of types of systems available.

EGR 629. ADVANCED MECHANICAL DESIGN (3)
PR: CC. A technical application course involving the problem of developing machines to perform specified functions. The machine to be designed will be designated by the instructor. The analysis will include evaluating all parts for stress, vibration, wear and proper consideration of manufacturing processes involved. Lec.-Lab.

EGR 630. APPLIED ENGINEERING ASPECTS OF FATIGUE (3)

EGR 632. VIBRATION ANALYSIS (3)
PR: EGR 533. Application of generalized coordinates, Lagrange's equation, matrix iteration, and other specialized methods to discrete multimass systems.

EGR 635. LUBRICATION II (3)
PR: EGR 535. A continuation of EGR 535 with emphasis on hydrodynamic squeeze film theory and gas lubricated bearings.

EGR 640. DIGITAL TECHNIQUES IN ENERGY TRANSFER SYSTEMS (3)
PR: EGR 441 or CI. Application of both general purpose and specialized programs to the solution of problems in the design of control systems, kinematic mechanisms and energy transfer systems. Some languages and programs to be used are FORTRAN, the Continuous System Modeling Program and the Mechanism Design Program.

EGR 641. ANALOG AND DIGITAL SIMULATION II (3)
PR: EGR 441 or CI. Introduction to mathematical modeling techniques applied to Mechanical and Chemical Engineering systems. The use of analog and digital computers in the solution of these models. Lec.-Lab.

EGR 642. DIMENSIONAL ANALYSIS AND MODEL THEORY I (3)
PR: CC. Theory of dimensional analysis, similarity, and design of models.

EGR 648. DIRECT DIGITAL CONTROL (3)

EGR 651. PHYSICAL MEASUREMENTS II (3)
PR: EGR 348, 441, 450 or CI. The techniques and theory for measuring temperature, pressure, displacement, speed, acceleration, force, power, and psychrometric properties with particular attention to dynamic measurement. Lec.-Lab.

EGR 655. NUMERICAL MEASUREMENT AND CONTROL (3)
PR: CC. Incremental and absolute control systems. Number systems used in numerical control. Digital to analog and analog to digital conversion. Applications.

EGR 657. FLUID AMPLIFIERS AND CIRCUITS (3)
PR: CC. Analysis and design of fluid devices for use as amplifiers, logic devices and memory elements in instrumentation and control systems.

EGR 659. ADVANCED MECHANICAL CONTROL (3)
PR: EGR 445 or CI. Applications of state space techniques to analysis and design of energy transfer control systems. Includes study of optimal control and adaptive control.

EGR 672. ADVANCED TRANSPORT PHENOMENA (4)
PR: EGR 472 or CI. Transport processes (mass, momentum and energy) are the underlying phenomena in energy conversion systems. This course expands and unifies the fundamental concepts introduced in undergraduate fluids and heat and mass transfer courses.

EGR 676. REACTING SYSTEMS II (4)
PR: EGR 476 or CI. Dynamics of heterogenous reaction.
Economic factors in the design of chemical reactors. Simulation of complex reacting systems.

**EGR 678. DESIGN AND CASE STUDIES**
PR: EGR 478. Plant and Process Design with emphasis on computer aided design. 

**EGR 680. SPECIAL PROBLEMS I**
PR: CC. (Formerly EGR 681.)

**EGR 681. DIRECTED RESEARCH**
PR: GR. Master's level. Repeatable. (S/U only.)

**EGR 682. SPECIAL PROBLEMS II**
PR: CC.

**EGR 694. GRADUATE INSTRUCTION METHODS**
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

**EGR 695. GRADUATE RESEARCH METHODS**
Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

**EGR 698. ADVANCED SEMINAR**
PR: CC.

**EGR 699. THESIS: MASTER'S**
Repeatable. (S/U only.)

**EGR 781. DIRECTED RESEARCH**
PR: GR. Ph.D. level. Repeatable. (S/U only.)

**EGR 799. DISSERTATION: DOCTORAL**
PR: Must be admitted to Doctoral Candidacy. Repeatable. (S/U only.)

**Industrial Systems (EGS)**

**EGS 402. INDUSTRIAL PROCESSES**
PR: EGB 337. Introduction to basic industrial processes emphasizing interdependency and similarities among industries. Students research specific industries and visit local industrial plants. Lec.-lab.

**EGS 403. PRODUCTION DESIGN I**
PR: EGS 402, EGB 306. Methods study, predetermined time systems, wage administration, work measurement techniques including stop-watch time study, work sampling, standard data and production studies. Lec.-lab.

**EGS 404. PRODUCTION DESIGN II**
PR: EGS 403. Continuation of EGS 403. Lec.-lab.

**EGS 405. PRODUCTION CONTROL SYSTEMS I**
PR: EGS 411, 441, 462. Principles and techniques of industrial planning and control systems design. Cost analysis, forecasting and controlling production activities.

**EGS 406. PRODUCTION CONTROL SYSTEMS II**
PR: EGS 405, 442. Advanced topics in industrial planning and control systems design including the use of CPM, PERT and LOB.

**EGS 407. ENGINEERING VALUATION II**
PR: EGB 337 or equivalent. Analysis of economic limitations on engineering projects. Income tax considerations, replacement models, MAPl and obsolescence.

**EGS 409. PLANT FACILITIES DESIGN I**
PR: EGS 404, 407. Design and modification of plant facilities, including design of a complete manufacturing operation. Problems in plant location, layout, material handling, and equipment selection.

**EGS 410. PLANT FACILITIES DESIGN II**
PR: EGS 409, 422, 442. Advanced techniques for evaluation of alternative plans for plant arrangement, including equipment location and material handling systems. (Formerly EGS 609.)

**EGS 411. NETWORK MODELS**
PR: EGB 304. A study of the design and analysis of network models as applied to the solution of process related situations.

**EGS 420. COMPARATIVE COMPUTER LANGUAGES I**
PR: EGB 204, 304. Comparison of higher level languages from viewpoint of structure, logic, data processing, speed and ease of usage for applications to system problems. Included are FORTRAN, WATFIV, SIMSCRIPT, GPSS, PL-I and ALGOL.

**EGS 421. COMPARATIVE COMPUTER LANGUAGES II**
PR: EGS 420. Use of the higher level languages analyzed in EGS 420 for specific applications to system design from the viewpoint of language comparisons and preferred choices. Additional comparisons are made with several procedure-oriented languages.

**EGS 422. COMPUTER SIMULATION I**
PR: EGB 304. Use of computers in physical and industrial systems. Simulation languages and their applications. (Formerly EGS 521.)

**EGS 423. COMPUTER SYSTEMS I**

**EGS 424. COMPUTER SYSTEMS II**
PR: EGS 423. Study of computer hardware usage. Peripheral subsystems. Transfer of information and control within a complete operating system. Executive systems and control monitors.

**EGS 425. COMPUTER SYSTEMS III**
PR: EGS 424. A continuation of EGS 424 stressing detailed applications of machine and assembly language to computer operating systems.

**EGS 427. FORTRAN APPLICATIONS I**

**EGS 429. COMPUTER PROJECTS**
PR: EGS 407, 421, 422, 424. Special projects involving the use and operation of digital computers.

**EGS 431. HYBRID COMPUTERS**

**EGS 441. OPERATIONS RESEARCH I**
PR: EGB 405. An introduction to the basic operations research techniques—linear programming, dynamic programming, simulation and queueing.

**EGS 442. OPERATIONS RESEARCH II**
PR: EGS 441, 462. Continuation of EGS 441.

**EGS 452. NUMERICAL METHODS**
PR: EGB 405. Continuation of material in EGB 405. (Formerly EGS 542.)

**EGS 462. ENGINEERING STATISTICS II**

**EGS 463. DESIGN OF EXPERIMENTS I**
PR: EGB 306. Development of the basic experimental design. Randomized block, latin squares and factorial designs. (Formerly EGS 561.)

**EGS 465. STATISTICAL QUALITY CONTROL**

**EGS 472. SYSTEMS ANALYSIS AND DESIGN**
PR: EGB 304, EGS 405, 442. The definition and analysis of systems. The solution of industrial systems problems using dynamic programming, simulation, queueing, linear and nonlinear programming.
EGS 503. HUMAN FACTORS (3)
PR: CC. Problems in the design, analysis and evaluation of man-machine systems from the viewpoint of physical, mental and psychological characteristics and limitations encountered.

EGS 505. INVENTORY CONTROL (3)
PR: EGS 406 or equivalent. Properties of inventory systems and the fundamentals of deterministic and probabilistic inventory models.

EGS 507. ENGINEERING VALUATIONS STUDIES (3)
PR: CC. The analysis of economic considerations affecting engineering decision making. Not open to students who have had EGS 407.

EGS 509. TECHNOCAL FORECASTING (3)
PR: Senior or graduate status. Open to non-majors. Recent developments in forecasting technical progress; morphological analysis, heuristic forecasts, intuitive methods, empirical and phenomenological models. Technology assessment.

EGS 510. COMPUTER OPERATION (4)
PR: Graduate engineering or science status. EGB 204 or equivalent, and CC. A comprehensive study of computer operating systems for mature students who have limited prior computer experience. Course covers material necessary to prepare the student for entry into the EGS 620, 621, 622 sequence.

EGS 522. COMPUTER SIMULATION II (3)
PR: EGS 422. Continuation of material in EGS 422.

EGS 533. FORTRAN APPLICATIONS II (3)
PR: EGS 427 or equivalent. Advanced numerical methods using FORTRAN, applied to higher level problems in the individual student's field of engineering, mathematics or applied science.

EGS 540. OPERATIONS RESEARCH (3)
PR: CC. Linear programming, game theoretic models, economic optimization. Not open to students who have had EGS 422.

EGS 550. HAZARD CONTROL ENGINEERING (3)
PR: Senior or graduate status. Open to non-majors. Nature of industrial accidents. Practices, standards, OSHA and other governmental requirements for reducing accident frequency and severity in the industrial environment. Design measures for the prevention of health impairment due to non-accidental causes.

EGS 560. INDUSTRIAL STATISTICS (3)
PR: CC. Industrial applications of probability, testing of hypotheses, regression techniques and analysis of variance. Not open to students who have had EGS 462.

EGS 562. DESIGN OF EXPERIMENTS II (3)
PR: EGS 463. Continuation of material in EGS 463.

EGS 563. ENGINEERING STATISTICS III (3)
PR: EGS 462 or equivalent. Application of non-parametric statistics, sequential analysis, orthogonal polynomials and other optimization techniques to industrial problems.

EGS 565. STATISTICAL QUALITY CONTROL (3)
PR: EGB 306 or equivalent. Application of statistical techniques to the control of industrial processes. Control charts and acceptance procedures. Sequential sampling.

EGS 566. RELIABILITY ENGINEERING (3)

EGS 580, 581, 582. SPECIAL INDUSTRIAL PROJECTS I, II, III (1-3 each)
PR: CC.

EGS 603. MAN/MACHINE SYSTEMS (3)
PR: EGS 503. Principles of work measurement, process analysis, value analysis, and human factors and their application to industrial situations.

EGS 605. PRODUCTION CONTROL SYSTEMS III (3)
PR: EGS 406 or equivalent. Forecasting procedures, development of production plans, scheduling techniques and inventory models. Application of EDP to production control systems.

EGS 607. ADVANCED ENGINEERING VALUATION (3)
PR: EGS 407 or equivalent. Statistical models for analyzing engineering alternatives from an economic viewpoint. The use of advanced engineering economy concepts in solving industrial problems.

EGS 620. COMPUTER THEORY I (3)

EGS 621. COMPUTER THEORY II (3)
PR: EGS 620. Advanced concepts in programming languages. The interrelation between machine, assembly and procedure oriented languages. Introduction to the design of monitors, assemblers, compilers.

EGS 622. COMPUTER THEORY III (3)
PR: EGS 621. Continuation and extension of EGS 621 emphasizing detailed design principles used in the construction of monitors, assemblers and compilers.

EGS 641. LINEAR PROGRAMMING (3)
PR: EGS 442 or equivalent. The simplex method, degeneracy, duality theory; applications of linear programming to industrial problems.

EGS 642. NONLINEAR AND DYNAMIC PROGRAMMING (3)

EGS 644. QUEUEING THEORY (3)
PR: EGS 442, 462. Deterministic and probabilistic queueing models. Poisson queues and special non-Poisson queues with exponential and non-exponential services. Single and multiple channel queues.

EGS 646. MULTIVARIABLE OPTIMIZATION (3)

EGS 647, 648. STOCHASTIC PROCESSES I, II (3,3)
PR: EGS 562. Theory and application of stochastic processes as models for empirical phenomena, with emphasis on the following processes: Poisson, stationary, normal, counting, renewal, Markov, birth and death. Spectral representations, time series, smoothing and filtering.

EGS 650. EVALUATION OF SYSTEM PERFORMANCE I (3)
PR: EGB 401, EGS 441, 462, or CC. Applications of probability and random processes to the design and evaluation of physical systems from the viewpoint of satisfying prescribed specifications. System variabilities include random process inputs and system parameters treated as random variables. Problems.

EGS 651. EVALUATION OF SYSTEM PERFORMANCE II (3)
PR: EGS 650. Continuation of EGS 650 with special emphasis upon writing the computer software required to implement the evaluation algorithms. Advanced problems.

EGS 661, 662. THEORY OF INDUSTRIAL STATISTICS I, II (3,3)
PR: EGS 462 or equivalent. Theoretical distributions, continuous and discrete expectation and estimation, properties of variables. Sampling distributions.

EGS 663, 664. STATISTICAL DESIGN MODELS I, II (3,3)
PR: EGS 662 or equivalent. Design of experiment mathematical models, application of advanced analysis of variable techniques as applied to industrial problems.
EGX 665. STATISTICAL ASSURANCE PLANS (3)
PR: EGS 565 or equivalent. Advanced techniques in sequential quality control systems and acceptance sampling plans.

EGX 666. THEORY OF RELIABILITY (3)
PR: EGS 462 or equivalent. Topics in statistical methodology which have applications in the field of reliability. Discrete and continuous distribution models, reliability estimation, reliability structure and growth models, and statistical design for reliability.

EGX 668. SPECIAL TOPICS IN STATISTICS (3)
PR: CC. Special topics in statistics related to research in engineering.

EGS 680, 682, 683. SPECIAL INDUSTRIAL TOPICS I, II, III (1-3 each)
PR: each.

EGS 681. DIRECTED RESEARCH (credit varies)
PR: GR. Master's level. Repeatable. (S/U only.)

EGS 687, 688. INDUSTRIAL SYSTEMS DESIGN I, II (3,3)
PR: EGS 422. Design of integrated systems using statistical and operations research models. Simulation of integrated systems using digital, analog and hybrid computers.

EGS 694. GRADUATE INSTRUCTION METHODS (1-5)
Special course to be used primarily for the training of graduate teaching assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

EGS 695. GRADUATE RESEARCH METHODS (1-5)
Special course to be used primarily for the training of graduate research assistants. Variable credit, repeatable. Limited to a cumulative total of 5 credits per student. (S/U only.)

EGS 698. ADVANCED ENGINEERING SEMINAR (1-3)
PR: CC

EGS 699. THESIS: MASTER'S (credit varies)
Repeatable. (S/U only.)

EGS 781. DIRECTED RESEARCH (credit varies)
PR: GR. Ph.D. level. Repeatable. (S/U only.)

EGS 799. DISSERTATION: DOCTORAL (credit varies)
PR: Must be admitted to Doctoral Candidacy. Repeatable (S/U only.)

Structures, Materials and Fluids (EGX)

EGX 301. ENGINEERING LAND SURVEYING (4)
Principles of land surveying for engineering practice. Traverse, levelling, boundary surveys, route surveys, coordinate geometry, and mapping.

EGX 330. ELEMENTS OF ENVIRONMENTAL ENGINEERING (4)
PR: CI. An introduction to the scientific and engineering principles needed for the enhancement of the quality of man's environment. Discussions of air and water pollution; solid waste disposal; ionizing radiation; noise. The economic, aesthetic, legal and political aspects of environmental quality are considered.

EGX 401. STRUCTURES I (4)
PR: EGB 304, 344. Analysis of single structural systems, both determine and indeterminate. Introduction to the use of energy methods in indeterminate analysis. Lecture.

EGX 402. MATERIALS ENGINEERING III (4)
PR: EGB 342, EGB 321. Principles of chemical thermodynamics as applied to the interaction of materials with various gaseous, aqueous, and solid phase environments. Lecture.

EGX 403. HYDRAULICS (4)

EGX 404. STRESS ANALYSIS (4)
PR: EGB 340. Analytical and experimental analysis of the mechanical behavior of deformable solids. Elastic and inelastic methods, plastic limit analysis, flexure and torsion of beams, photolasticity, electric strain gages, introduction to finite element computer methods. Lec.-lab.

EGX 405. SOLID MECHANICS III (4)
PR: EGB 341. Dynamics of discrete and distributed mass, spatial kinematics, and kinetics, inertia tensor, Euler equations, vibrations. Lecture (Formerly EGX 505.)

EGX 406. ENGINEERING ANALYSIS SMF (4)
PR: EGB 204, EGB 401. Computational methods for engineering problems found in Structures, Materials and Fluids. Lec.-lab.

EGX 407. SENIOR RESEARCH/DESIGN PROJECT I (1)
PR: Completion of 150 hours. Presentation of current and future problem-oriented research/design topics for engineers. Organization of student-faculty investigative teams for senior projects in EGX 408 or EGX 499. (Formerly EGX 409.)

EGX 408. SENIOR RESEARCH/DESIGN PROJECT II (3)
PR: EGX 497. Problem-solving experience and training for seniors in research/design projects. Oral and written final reports are required. (Formerly EGX 509.)

EGX 410. STRUCTURES II (4)
PR: EGX 401. Introduction to the behavior of composite structural members: laminates, sandwich panels, reinforced concrete, timber and structures. Lec.-lab.

EGX 411. CONCEPTS OF STRUCTURAL DESIGN (4)
PR: EGX 401. Applications of solid mechanics, materials science and structural analysis to the design of building, bridge, aircraft and ship structures. Critical review of current codes and specifications. Lec.-lab.

EGX 412. STRUCTURES III (5)
PR: EGX 401. Elastic and plastic analysis of determinate and indeterminate frames and trusses. Emphasis on matrix-computer techniques. Lec.-lab. (Formerly EGX 511.)

EGX 413. PRESTRESSED STRUCTURES (5)
PR: EGX 410. Analysis and design of prestressed structural systems. Emphasis on prestressed concrete. Lec.-lab. (Formerly EGX 513.)

EGX 414. STRUCTURAL CONNECTIONS (3)
PR: EGX 411. Use of theoretical and experimental data in the analysis and design of structural connections in metal, wood, concrete and plastic. Lec.-lab. (Formerly EGX 514.)

EGX 415. STRUCTURES IV (5)
PR: EGX 412. Analysis of suspension structures, towers and tall buildings by both approximate and exact methods. Lec.-lab. (Formerly EGX 515.)

EGX 416. STRUCTURAL DESIGN IN METALS (4)
PR: EGX 411, 412. Design of ductile metallic structural elements and systems. Lec.-lab. (Formerly EGX 516.)

EGX 417. REINFORCED CONCRETE STRUCTURES (4)
PR: EGX 411, EGX 412. Design of reinforced concrete structures: interpretation and application of various codes and specifications governing design. Lecture. (Formerly EGX 517.)

EGX 420. CONCEPTS OF ENGINEERING MATERIALS (3)

EGX 421. PROCESSES IN MATERIALS ENGINEERING (3)
PR: EGX 402 or CI. Introduction to the basic theories of solidification and ultrapurification of materials, discussion of the various techniques of welding and joining materials, and discussion of the primary methods of shaping and forming materials. Lecture.
EGX 422. SELECTION AND APPLICATION OF ENGINEERING MATERIALS (3)
PR: EGB 342. Estimation and/or determination of the property requirements for the utilization of materials in specific applications; comparison of properties of metals, plastics, and ceramics; the effects of heat treatment, working, etc., on materials; property limitations exhibited by various materials. Lecture.

EGX 425. CORROSION OF ENGINEERING MATERIALS I (3)

EGX 426. DIFFUSION (3)
PR: EGX 402. Theoretical and practical analysis of diffusion in solids including the physical meaning and implications of the concepts which influence and apply to diffusion in crystalline solids. Lecture. (Formerly EGX 523.)

EGX 427. ENGINEERING CERAMICS (3)
PR: EGB 342. Detailed examination of the materials of ceramic engineering and the engineering properties of advanced ceramic products. Lecture. (Formerly EGX 524.)

EGX 428. STRENGTHENING PROCESSES IN MATERIALS (3)
PR: EGX 402. Introduction to the separate and combined effects of the primary strengthening mechanisms in materials. Applications to the real material systems such as steels, titanium, beryllium, nickel and refractory metal alloys; and composites. Lecture.

EGX 435. WATER RESOURCES ENGINEERING I (4)
PR: EGB 343. A study of the engineering principles involved in the sustaining and managing of the quality and quantity of water available for human activities with particular emphasis on hydrology and hydraulics. Lecture. (Formerly EGX 535.)

EGX 436. WATER RESOURCES ENGINEERING II (3)
PR: EGB 343. A study of the engineering principles involved in the sustaining and managing of the quality and quantity of water available for human activities with particular emphasis on water uses, engineering economy, and regional water resource development. Lecture. (Formerly EGX 536.)

EGX 437. URBAN WATER SYSTEMS (4)
PR: EGX 435. A study of the engineering principles involved in the design and operation of urban water supply systems, urban drainage systems, urban waste water collection systems and urban waste water treatment systems.

EGX 438. ADVANCED HYDROLOGY LABORATORY (3)
PR: EGX 437. Practical experience in the solution of hydrologic problems including data collection, data processing, and the application of numerical computer models to watersheds.

EGX 439. INTRODUCTION TO AIR POLLUTION CONTROL (4)
PR: EGB 322 or CI. Behavior and effects of atmospheric contaminants and the principals of making measurements in the air environment are studied. Basic concepts of meteorology and control technology are discussed. Regulatory aspects and air pollution standards are covered. Lecture. (Formerly EGX 437.)

EGX 440. EXPERIMENTAL MECHANICS I (4)
PR: EGB 343. An introduction to the experimental methods used in the study of structures, materials, fluids. Lec.-lab. (Formerly EGX 504.)

EGX 441. EXPERIMENTAL MECHANICS II (4)
PR: CC. Review of elasticity, boundary value problems, finite element solutions; static and dynamic applications, circuitry; grid, brittle coating methods. Lec.-lab. (Formerly EGX 540.)

EGX 442. STRUCTURAL MECHANICS (4)

EGX 443. STRUCTURAL DYNAMICS (3)
PR: EGX 442. Behavior of structural components and systems when subjected to periodic dynamic loads. Lecture.

EGX 450. SOLID MECHANICS IV (3)
PR: EGB 341. Dynamics of Elastic Systems, Vibration of rods, plates, shells, structures; Energy and approximate solution techniques, transform techniques. Lecture. (Formerly EGX 550.)

EGX 451. VIBRATIONS (3)
PR: EGX 405. Wave motion in solids and fluids, thermal and mechanical shock wave transmission and attenuation; blast loading. Phase-plane analysis. Lecture. (Formerly EGX 551.)

EGX 481. TRANSPORTATION I (4)
PR: EGB 401, CI. Introduction to Transportation Engineering. Lecture.

EGX 482. TRANSPORTATION II (4)
PR: EGX 481. Transportation system planning. Lecture. (Formerly EGX 581.)

EGX 485. SOIL MECHANICS I (4)
PR: EGB 343. Fundamental and experimental concepts in soil mechanics with emphasis on soil properties, soil moisture, soil structure and shearing strength. Lecture.

EGX 486. SOIL MECHANICS II (4)
PR: EGX 485. A study of the application of the principles of soil mechanics to problems in soils engineering. Lecture. (Formerly EGX 585.)

EGX 499. RESEARCH IN SMF (1-4)
PR: CC. (Formerly EGX 599.)

EGX 545. VISCOUS FLOWS (3)

EGX 546. POTENTIAL FLOW (3)
PR: EGB 343. Mathematical hydrodynamics, inviscid flow. Lec.-lab. (Formerly EGX 430.)

EGX 547. AERODYNAMICS (3)
PR: EGB 343. Fundamentals of compressible flow and flight dynamics. Structural Design; materials consideration. Lecture. (Formerly EGX 438.)

EGX 570. ANALYTICAL METHODS IN MECHANICS (3)
PR: CI. Development of techniques of applied mathematics to SMF problems; partial differential equations, complex variable, vector and tensor analysis. Lecture.

EGX 571. CONTINUUM I (3)
PR: CI. Development of fundamental problems in solids and fluids from a unified viewpoint; application to ideal media; elastic, plastic, visco-elastic, and fluids. Lecture.

EGX 572. CONTINUUM II (3)
PR: EGX 571. Mathematical Theory of elasticity. Two dimensional problems in plane stress and plane strain using cartesian and curvilinear coordinates; three dimensional applications to torsion, bending and semi-infinite solids. Lecture.