CHEMISTRY


CHM 101. FOUNDATIONS OF UNIVERSITY CHEMISTRY (5)
Designed as a terminal course to survey modern chemistry, particularly for the student who has had no previous chemistry courses; and as preparation for CHM 211-213. Lec. Qtr. I, III, IV.

CHM 211. GENERAL CHEMISTRY I (4)
While there is no prerequisite, CHM 211 students are expected to have performed well in high school chemistry or to have satisfactorily completed CHM 101. Fundamentals of chemistry; mass and energy relationships in chemical and equilibrium, chemical kinetics, atomic and molecular structure, descriptive chemistry of selected elements. Lec-lab and discussion. Qtr. I, II, IV.

CHM 212. GENERAL CHEMISTRY II (4)
PR: CHM 211 or equivalent. Continuation of General Chemistry, lec-lab and discussion. Qtr. I, II, III.

CHM 213. GENERAL CHEMISTRY III (4)
PR: CHM 212 or equivalent. Continuation of General Chemistry, lec-lab and discussion. Qtr. I, III, IV.

CHM 301. ELEMENTARY INORGANIC CHEMISTRY (4)
PR: CHM 213 or equivalent. Fundamental inorganic chemistry principles. One-quarter course for non-chemistry majors. lec-lab. Qtr. IV.

CHM 305. ELEMENTARY PHYSICAL CHEMISTRY (5)
PR: CHM 213, 321. Fundamental physical chemistry principles. One-quarter course for non-chemistry majors. lec-lab. Qtr. III, IV.

CHM 311. INTERMEDIATE INORGANIC CHEMISTRY (5)
PR: CHM 213. 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. Fundamental principles of organic chemistry and lab. Lecture and lab must be taken concurrently. I, II.

CHM 333-334. ORGANIC CHEMISTRY II (3:2)
PR: CHM 331-332 or equivalent. Continuation of Organic Chemistry and lab. Lecture and lab must be taken concurrently. Qtr. II, III.

CHM 335-336. ORGANIC CHEMISTRY III (3:2)
PR: CHM 333-334 or equivalent. Continuation of Organic Chemistry and lab. Lecture and lab must be taken concurrently. Qtr. I, III, IV.

CHM 351. INTRODUCTORY BIOCHEMISTRY (4)
PR: CHM 333. Introduction to the chemistry and intermediary metabolism of biologically important substances. Lecture. Qtr. III, IV.

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. (May not be counted for credit toward a chemistry major.) Qtr. I, II, III, IV.
CHM 441. PHYSICAL CHEMISTRY I (4)

CHM 442. PHYSICAL CHEMISTRY II (4)

CHM 443. PHYSICAL CHEMISTRY III (4)

CHM 445. METHODS OF CHEMICAL INVESTIGATION I. ANALYTICAL-PHYSICAL (4)
PR: CHM 321, 335-6. 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 481. UNDERGRADUATE RESEARCH (1-6) (S/U grade only.)
PR: CI. 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 491. CHEMISTRY SEMINAR (2) (S/U grade only.)
PR: Senior standing. Qtr. I-IV.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

CHM 511. ADVANCED INORGANIC CHEMISTRY (4)
PR: CHM 441 or CI. An advanced theoretical treatment of inorganic compounds. Lecture. Qtr. II.

CHM 521. INSTRUMENTAL ANALYSIS (4)

CHM 523. RADIOCHEMISTRY (4)
PR: CHM 321. Theory and applications of natural and induced radioactivity. Emphasis on the production, properties, measurement, and uses of radioactive tracers. Lec-lab. Qtr. III.

CHM 531. ADVANCED SYNTHETIC CHEMISTRY (4)
PR: CHM 333. A study of synthetic techniques from both the practical and the theoretical points of view, lec-lab.

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. Lecture.

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. Lecture.

CHM 542. APPLICATIONS IN PHYSICAL CHEMISTRY (4)
PR: CHM 443. Applications of chemical theory to chemical systems with emphasis on the thermodynamics of real systems, molecular spectroscopy, and the chemical kinetics of complex systems. lec-disc. Qtr. I.

CHM 551. BIOCHEMISTRY I (4)
PR: CHM 335, 6. The chemistry and intermediary metabolism of biologically
CHEMISTRY 173

importantsubstances, including carbohydrates, proteins, enzymes, vitamins, and
metabolic intermediates.

Recommended for chemistry and biology majors. Lec. Qtr. I.

CHM 552. BIOCHEMISTRY II (4)
PR: CHM 551. Continuation of Biochemistry I. Lec. Qtr. II.

CHM 553. BIOCHEMISTRY III (4)
PR: CHM 552. Continuation of Biochemistry. Lec. Qtr. III.

CHM 554. TECHNIQUES IN BIOCHEMISTRY (2)
PR: CHM 551. Biochemistry laboratory with emphasis on modern techniques for
use in biochemical research. Qtr. III.

CHM 555. SELECTED TOPICS IN CHEMISTRY (1-6)
PR: CC. The following courses are representatives of those that are taught under
this title: Natural Products, Stereochemistry, Reactive intermediates, Photochem-
istry, instrumental Electronics, Advanced Lab Techniques, Heterocyclic Chem-
istry, etc.

FOR GRADUATE STUDENTS ONLY

CHM 611. STRUCTURAL INORGANIC CHEMISTRY (4)
PR: CHM 511 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.
Lecture. Qtr. III.

CHM 613. CHEMISTRY OF THE LESS FAMILIAR ELEMENTS (4)
PR: CI. An integrated treatment of the conceptual and factual aspects of the tra-
ditionally less familiar elements, including noble-gas elements, unfamiliar non-
metals, alkali and alkaline-earth metals, and the transition elements. Lec. Qtr. II.

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. Lecture. Qtr. II.

CHM 623. ELECTROCHEMISTRY (4)
PR: CHM 521. Introduction to the theory of ionic solutions and electrode
III.

CHM 625. ADVANCED ANALYTICAL TOPICS (4)
PR: CI. Selected topics in analytical chemistry. Offerings include radiochemistry
(emphasizing radiotracers in research and analysis), chemical spectroscopy, (in-
cluding both emission and absorption), and quantitative organic analysis. (Lec-
ture; some topics may have lab)

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. II.

CHM 632. ADVANCED ORGANIC CHEMISTRY II. PHYSICAL-ORGANIC (4)
PR: CHM 532. A study of organic reaction mechanisms emphasizing the inter-
pretation of experimental data. Lecture. Qtr. III.

CHM 633. ADVANCED ORGANIC CHEMISTRY III. SYNTHESIS (4)
Qtr. III.

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. Lecture. Qtr. IV.

CHM 643. QUANTUM CHEMISTRY I (4)
PR: CI. Introduction to elementary quantum mechanics. Atomic structure and
spectra. Lecture. Qtr. III.

CHM 645. QUANTUM CHEMISTRY II (4)
PR: CHM 643. Applications of quantum mechanics to problems in chemistry;
molecular structure and spectra. Lecture. Qtr. I.
CHM 647. CHEMICAL KINETICS (4)
PR: CI. Theory and methods for the study of reaction rates and the elucidation of reaction mechanisms. Lecture. Qtr. II.

CHM 651. ADVANCED BIOCHEMISTRY I. ENZYMES (4)
PR: CHM 553 or CI. A study of biochemical systems with emphasis on enzymes. Lecture. Qtr. I.

CHM 652. ADVANCED BIOCHEMISTRY II. PROTEIN AND NUCLEIC ACIDS (4)
PR: CHM 553 or CI. A study of biochemical systems with emphasis on proteins and nucleic acids. Lecture. Qtr. II.

CHM 653. ADVANCED BIOCHEMISTRY III. BIOORGANIC MECHANISMS (4)
PR: CHM 553 or CI. A study of biochemical systems with emphasis on mechanisms of biological reaction. Lecture. Qtr. III.

CHM 654. ADVANCED BIOCHEMISTRY IV. BIOPHYSICAL CHEMISTRY (4)
PR: CHM 553 or CI. A study of biochemical systems with emphasis on physical methods of experimentation and interpretation. Lecture.

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. GRADUATE RESEARCH (1-15)
PR: CC. Directed study along lines of the student’s research, including participation in regular seminars. May be repeated. (S/U grade only.)

CHM 683. SELECTED TOPICS IN CHEMISTRY (1-6)
PR: CC. 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. S-U grading only. 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. Qtr. I-IV. (S/U grade only.)

CHM 689. DIRECTED TEACHING (3-9)
PR: Graduate Standing. A formalized structured activity wherein a faculty member, by discussion and assignments, considers the principles, rationale, and modus operandi of elementary college courses. Designed to train teaching assistants and to provide help and training to those graduate students who plan to follow a college-teaching profession. (S/U grade only.) Qtr. I-IV.

CHM 691. GRADUATE SEMINAR IN CHEMISTRY (2)
Qtr. I-IV (S/U grade only.)

CHM 699. MASTER’S THESIS (1-5)
Qtr. I-IV. (S/U grade only.)

CHM 781. GRADUATE RESEARCH (1-5)
Qtr. I-IV. (S/U grade only.)

CHM 783. SELECTED TOPICS (1-5)
The course content will depend on the interest of faculty members and student demand.

CHM 799. PH.D. DISSERTATION (1-5)
PR: CI. Qtr. I-IV. (S/U grade only.)

CLASSICS AND ANCIENT STUDIES

Faculty: Gessman, chairman; J. B. Camp, Henley, Zbar.

CLS 101-102-103. ELEMENTARY LATIN (3,3,3)
Elements of grammar, practice in translation from and into Latin, reading of selections from simple Latin texts.
CLS 201. INTERMEDIATE LATIN I (3)
PR: CLS 103 or equiv.; CR: two-hour per week grammar workshop (no credit).
Selections from Cicero's speeches and systematic exercises in intermediate grammar.

CLS 202. INTERMEDIATE LATIN II (3)
PR: CLS 201 or equiv. Selections from the letters of Cicero and Pliny the Younger.
(Alternate years.)

CLS 203. INTERMEDIATE LATIN III (3)
PR: CLS 201 or equiv. Selections from Ovid read in Latin and interpreted. Study of the Metamorphoses in English translation and of Graeco-Roman mythology. (Alternate years.)

CLS 301. LATIN HISTORIANS (3)
PR: CLS 201 or equiv. Reading and interpretation of selected passages from the works of Sallust, Livy, and Tacitus in the original and of portions of their works in English translation. (Alternate years.)

CLS 302. LATIN LYRICS (3)
PR: CLS 201 or equiv. Reading and interpretation of selected poems by Roman lyricists, especially Catull and Horace. Introduction into Latin metrics. (Alternate years.)

CLS 303. LATIN EPIC (3)
PR: CLS 201 or equiv. Reading and interpretation of selected passages from Vergil's Aeneid in the original and of the entire work in English translation. Comparison with Greek epic. (Alternate years.)

CLS 321. ANCIENT CIVILIZATIONS (5)
Study of the character, ideas and cultural achievements of the peoples of the Ancient Near East and Mediterranean and their relevance for modern Western civilization, with special emphasis on the Hebrews, Greeks and Romans.

CLS 331-332-333. BASIC GREEK (3,3,3)
PR: Junior or senior standing or a minimum of two years of Latin or another highly inflected language (e.g., German, Russian, Modern Greek) or CI. Accelerated course in the Ancient Greek (Attic) language and introduction to original Greek literature. (Alternate years.)

CLS 341-342-343. BASIC HEBREW (3,3,3)
Designed to give students a working knowledge of Classical (Biblical) Hebrew and to introduce them to the Biblical literature in the original language. (Alternate years.)

CLS 351. CLASSICAL MYTHOLOGY (4)
Study of the more important myths of the Greeks and Romans as laid down in classical literature and of the impact that Classical mythology made on modern Western and, in particular, English literature.

CLS 354. GREEK LITERATURE IN TRANSLATION I: POETRY AND PROSE (4)
An introduction to the masterworks of Greek poetry and prose including the epic, lyric poetry and history. This course is an elective for students who do not have a reading knowledge of Greek, and does not count toward the Classics and Ancient Studies major.

CLS 355. GREEK LITERATURE IN TRANSLATION II: DRAMATIC LITERATURE. (4)
An introduction to the masterworks of Greek drama in their cultural context. The course concentrates on comedy and tragedy of the fifth century B.C. An elective for students who do not have a reading knowledge of Greek, this course does not count toward the Classics and Ancient Studies major.

CLS 356. ROMAN LITERATURE IN TRANSLATION. (4)
An introduction to the poetry and prose of the Republican Age, the Augustan Age, and the Silver Age. This course is an elective for students who do not have a reading knowledge of Latin, and does not count toward the Classics and Ancient Studies major.

CLS 359. CLASSICAL WORD ROOTS IN SCIENCE (2)
A course in the Greek and Latin word stock used in all sciences (including
medicJac (4), technology, and law. Students' needs determine specific content of the course.

**CLS 371. FOUNDATIONS OF LANGUAGE (4)**
Introduction to synchronic linguistics, basic concepts, general features of language. Dialects, kinship groups, language types, writing systems. Methods of structural analysis with emphasis on the Trubetzky-Jakobson approach. (Alternate years.)

**CLS 383. SELECTED TOPICS (2-5)**
Course contents depend on student demand and instructor's interest and may range over the field of Latin language, literature, or civilization.

**CLS 401-402-403. ADVANCED GRAMMAR AND COMPOSITION (3,3,3)**
PR: CLS 201 plus any two of CLS 202, 203, 301, 302, 303, or 4 years high school Latin. Difficult parts of morphological and syntactic structure. Exercises in advanced translation and composition. Theory of literature: genres, styles, figures of speech, principles of oratory and versification. (Alternate years.)

**CLS 411,412,413. LATIN LITERATURE AND BACKGROUNDS (3,3,3)**
PR: Same as for CLS 401. Fast survey of Greek literature, discussion of Roman dependence on Greek literary topics, concepts and forms. Survey of Latin literature from Ennius to Augustine. Study and interpretation of sample texts by authors not read earlier. (Alternate years.)

**CLS 483. SELECTED TOPICS (2-5)**
Course contents depend on student demand and instructor's interest and may range over the whole field of Ancient languages, literatures, and civilizations, in particular Latin, Greek, and Hebrew. Enrollment can be repeated for different topics.

**CLS 485. DIRECTED READING (2-5)**
Readings in special topics chosen by the student in cooperation with the instructor. Reading of literature also possible in English translation. Arrangement with department chairman before registration necessary.

**FOR UPPER LEVEL AND GRADUATE STUDENTS**

**CLS 517. LATINO-ROMANCE LINGUISTICS (4)**
PR: Background in Latin or a Romance language. Case study of linguistic development of 4,000 years from Proto-Aryan through Latin to modern Romance languages. (Alternate years.)

**CLS 527. GREEK CIVILIZATION (4)**
PR: CLS 321 or a course in Greek history or CI. Detailed study of the Aegean and Hellenic civilizations from their beginnings in Crete to the Roman period. Greek discoveries, explorations, and colonization. (Alternate years.)

**CLS 529. ROMAN CIVILIZATION (4)**
PR: CLS 321 or 527 or a course in Roman history; or Latin major; or CI. Prehistoric Italy and the Etruscan civilization. History of the civilization of Rome and the Empire with emphasis on the Greek, Carthaginian, and Oriental influences. (Alternate years.)

**CLS 571. LANGUAGE IN CHANGE (4)**
Principles of diachronic (historical) and comparative linguistics. Causes and documentation of change, research methods. History of writing. Genealogy of languages, glottogonic theories. Ethnolinguistics. (Alternate years.)

**CLS 581. INDIVIDUAL RESEARCH (2-5)**
PR: CI. Specialized individual work in particular areas of student's interests.

**CLS 583. SELECTED TOPICS (2-5)**
For description see CLS 483

**CLS 585. DIRECTED READING (2-5)**
For description see CLS 485.

**COOPERATIVE EDUCATION**

Coordinating Staff: G. Miller, director; Lentz, assistant director; Card, M. Fager, G. McClung, Minor, Rodriguez.
COE 071. CAREER PLANNING AND SOCIETAL EXAMINATION (1)
Course content covers career planning via the Cooperative Education Program, explores values of cooperative education, blending of theory and practice, and providing relevance in the educational process.

COE 171. COOPERATIVE EDUCATION, 1ST TRAINING PERIOD (0)
PR: 24 hours of academic credit, acceptance in Cooperative Education Program.

COE 172. COOPERATIVE EDUCATION, 2nd TRAINING PERIOD (0)
PR: COE 171.

COE 271. COOPERATIVE EDUCATION, 3RD TRAINING PERIOD (0)
PR: COE 172.

COE 272. COOPERATIVE EDUCATION, 4TH TRAINING PERIOD (0)
PR: COE 271.

COE 371. COOPERATIVE EDUCATION, 5TH TRAINING PERIOD (0)
PR: COE 272.

COE 372. COOPERATIVE EDUCATION, 6TH TRAINING PERIOD (0)
PR: COE 371.

COE 400. COOPERATIVE EDUCATION REPORT (1-5)
PR: COE 071. A course designed specifically for Cooperative Education students in which the student pursues a project dealing with his Cooperative Education assignment and his major area of professional interest. (This course may be used with any other 3-letter prefix if approved by the chairman and dean concerned.)

COE 401. COMMUNITY INTERACTION (1-5)
Utilizes the community as a learning laboratory by involving the student off campus with a wide range of activities to develop a perception of and sensitivity to the problems of our society.

COE 471. COOPERATIVE EDUCATION, 7TH TRAINING PERIOD (0)
PR: COE 372.

COE 472. COOPERATIVE EDUCATION, 8TH TRAINING PERIOD (0)
PR: COE 471.

COE 571. COOPERATIVE EDUCATION, 9TH TRAINING PERIOD (0)
PR: COE 472.

COE 572. COOPERATIVE EDUCATION, 10TH TRAINING PERIOD (0)
PR: COE 571.

COE 671. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

COE 672. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

COE 771. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

COE 772. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

COE 871. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

COE 872. COOPERATIVE EDUCATION, TRAINING PERIOD (0)

DANCE

Faculty: Hug, chairman; Coates, Hovinga, Turoff.

DAN 201. MODERN DANCE I (3)
Study of basic principles of modern dance technique, for those without previous training. Practical work in beginning exercises and movement phrases, utilizing changing rhythms and dynamics. May be repeated.

DAN 202. BALLET I (3)
Study of basic positions, barre and fundamental steps using the ballet vocabulary. For those without previous ballet training. Practical work in class. 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.

DAN 301. MODERN DANCE II (3)
PR: DAN 201 or CI. 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. BALLET II (3)**  
PR: DAN 202 or CI. Continuation of DAN 202, progressing into adagio and allegro. Application of phrasing and style. May be repeated.

**DAN 303. CHOREOGRAPHY II (3)**  
PR: DAN 203 or CI. Preparation of studies in rhythm, dynamics, form and motivation, culminating in a solo.

**DAN 311. REPETORY**  
The development and performance of solo and/or group dances. Open to all University students by audition. May be repeated.

**DAN 313. HISTORY OF DANCE TO THE 20TH CENTURY (3)**  
Study of the development of dance from its inception through the nineteenth century. Reading, lecture.

**DAN 370. INTRODUCTION TO DANCE**  
For non-dance majors — a study of the art of dance. Lecture and activities including Modern, Ballet, Jazz, Ethnic and Tap. DAN 370 fulfills the FNA requirements for majors in Theatre Arts, Visual Arts and Music Arts.

**DAN 401. MODERN DANCE III (3)**  
PR: DAN 301 or DAN 302 or CI. Continuation of DAN 301 on an advanced level. Work in improvisation and individual invention creating an awareness of many possibilities of movement. Dancing in student choreography leading to performance. Rehearsal hours to be arranged. May be repeated.

**DAN 402. BALLET III (3)**  
PR: DAN 302 or DAN 301 or CI. Continuation of DAN 302. Introducing pointe work. Each class member will dance in student choreography. Rehearsal hours to be arranged. May be repeated.

**DAN 403. CHOREOGRAPHY III (3)**  
PR: DAN 303 or CI. Work directed toward duets and group dances. The students will submit choreographic ideas for instructor’s approval, then proceed with rehearsals. The best dances will be performed and fully produced under supervision of student choreographers. Reading, lecture, laboratory.

**DAN 413. HISTORY OF 20TH CENTURY BALLET (3)**  

**DAN 481. DIRECTED STUDY (1-6)**  
PR: CC. May be repeated. Independent studies in the various areas of Dance. Course of study and credits must be assigned prior to registration.

**DAN 501. MODERN DANCE IV (3)**  
PR: DAN 401 or CI. Continuation of DAN 401. Intensive work on the growth of personal performance style as a means to communication. Equal emphasis will be given to training the body in the development of technical excellence. Dancing in student choreography leading to performance. Rehearsal hours to be arranged. May be repeated.

**DAN 502. BALLET IV (3)**  
DAN 402 or CI. Continuation of DAN 402. Great emphasis to final shaping of the body into excellent execution and projection of Ballet technique. Dance in student choreography leading to performance. Rehearsal hours to be arranged. May be repeated.

**DAN 503. PRODUCTION (3)**  
Admission by audition. Open to all university students and required of dance majors for two quarters. The rehearsal and stage performance of new choreography. Actual production work in which members of the class assist the choreographer in costumes, taping and props. May be repeated.

**DAN 513. HISTORY OF MODERN DANCE (3)**  
Study of the development of modern dance in the 20th Century in America; the different techniques, concepts in choreography and leading artists of our time. Reading, film, and lecture.
DEVELOPMENTAL COURSES

DRE 001. DEVELOPMENTAL READING (0)
Designed to help students develop maximum reading efficiency. Includes extensive instruction and laboratory practice in the improvement of adequate rates of reading, vocabulary and comprehension skills. An independent study approach is also available for students who prefer to assume responsibility for their own progress.

DMA 001. BASIC CONCEPTS OF ALGEBRA (0)
A programmed learning course in Algebra from a modern point of view for the convenience of persons without adequate knowledge of simple algebraic manipulations and for persons without adequate preparation for MTH 101.

DMA 002. ANALYTICAL TRIGONOMETRY (0)
A programmed learning course in the study of the trigonometric functions as functions of real numbers and their application to triangles.

DRS 001. DEVELOPMENTAL STUDY SKILLS (0)
Designed to help students develop efficient learning methods needed for college success. Includes instruction and practice in effective study techniques, ranging from developing proper attitude toward studying, listening and taking notes to preparing for and taking exams.

ECONOMICS

Faculty: Pasternak, Chairman; Burton, Cloninger, J. Cooke, Davey, Hanni, Herman, James, Kauder, Kennedy, McElhattan, Mellish, Murphy, R. F. Shannon, Shows, L. Small, Swanson, F. Whartenby.

ECN 201. ECONOMIC PRINCIPLES I (4)
Economics as a social science; theoretical analysis of price determination of the product and factor markets.

ECN 202. ECONOMIC PRINCIPLES II (4)
Accounting, analytical and policy aspects of national income with emphasis on the theory of income determination; analysis of money and banking system; and survey of international trade theory and policies.

ECN 231. BUSINESS AND ECONOMIC STATISTICS I (3)
PR: MTH 211 or equivalent. Frequency distributions, measures of central tendency and deviation, an introduction to probability, random variables, and the normal distribution.

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 recourse pricing.

ECN 311. LABOR ECONOMICS (4)
PR: ECN 201-202 or 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 313. COLLECTIVE BARGAINING (5)
PR: ECN 311. The administration of labor-management arguments, mediation and arbitration of industrial disputes and governmental role in collective bargaining.

ECN 323. INTERMEDIATE INCOME AND MONETARY ANALYSIS (5)
PR: ECN 201-203. Advanced analysis of national income and monetary theory with emphasis on the modern theory of income determination and the functioning of the monetary system.

ECN 331. BUSINESS AND ECONOMIC STATISTICS II (5)
PR: ECN 231 and MTH 211 or equivalent. Statistical inference, simple and multiple regression analysis, time series analysis, and Bayesian statistics.

ECN 341. ECONOMICS OF TRANSPORTATION (4)
PR: ECN 201-202. Functions of transportation agencies, rate structure of trans-
portation companies, problems of state and federal regulations and coordination of transportation facilities.

**ECN 343. ECONOMICS OF PUBLIC UTILITIES (4)**

**ECN 351. INTERNATIONAL ECONOMICS (4)**
PR: ECN 201-202. The principles and mechanisms of trade, exchange, balance of payments, comparative costs, effects of trade restrictions and economic growth of underdeveloped areas.

**ECN 361. INTRODUCTION TO MATHEMATICAL ECONOMICS (4)**
PR: CBS 109-110, ECN 201-202, and 331. The principal mathematical tools and techniques used in economic analysis and economic research.

**ECN 371. AMERICAN ECONOMIC HISTORY (4)**
PR: ECN 201-202. The growth and evolution of American economic institutions from Colonial times to the present.

**ECN 373. ECONOMICS OF THE URBAN ENVIRONMENT (5)**
PR: ECN 201-202 or CI. Economic analysis of urban problems including: land use, transportation, Urban Labor Markets, and the local public sector.

**ECN 401. HISTORY OF ECONOMIC THOUGHT (5)**
PR: ECN 201-202. An historical survey of the development of the economic theory and the main streams of economic thought, including philosophical and value aspects of economic thought.

**ECN 405. COMPARATIVE ECONOMIC SYSTEMS (4)**
PR: ECN 201-202. An emphasis on the theoretical and practical differences between economic systems such as capitalism, socialism, and communism.

**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)**

**ECN 425. MONETARY THEORY (5)**
PR: ECN 301, 323. A discussion of the impact of the financial sector upon real economic magnitudes. The course approaches its subject matter through the theory of capital and portfolio adjustments with emphasis upon the contributions of Pigou, Heynes, Tobin, Gurley, and Shaw.

**ECN 431. BUSINESS AND ECONOMIC STATISTICS III (4)**
PR: ECN 331, MTH 212 or CI. Theory and use of statistical inference in prediction and decision. Jointly distributed random variables, loss functions, linear models of stationary stochastic processes, small sample theory, tests for precision and significance in estimation. Extensions to econometric investigation of time series data and to Bayesian formulation of optimal decision rules.

**ECN 437. BUSINESS — GOVERNMENT RELATIONSHIPS (4)**
PR: ECN 201-202. Patterns of regulations such as control of competitive enterprise, cartels and monopolies by the government. Government regulations and economic planning applied to politically determined economic goals.

**ECN 451. INTERNATIONAL COMMERCIAL POLICIES (4)**
PR: ECN 351. Geographic, social, political and related factors influencing commercial trade policies. Special emphasis on economic consequences of alternative courses of action.

**ECN 461. THEORY OF ECONOMIC DEVELOPMENT (4)**
PR: ECN 323 or CI. Problems, 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. THÉORIE DE L'ÉCONOMIE DYNAMIQUE (4)**
PR: ECN 323. Economic theories of the business cycle and growth processes. Empirical studies, models for forecasting, and problems of policy are also considered.
ECN 489. SEMINAR IN SELECTED ECONOMIC TOPICS (3-5)
PR: Senior Standing and CI. Topics to be selected by the instructor or instructors on pertinent economic issues.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

ECN 501. ECONOMIC PRICE THEORY (3)
Theoretical analysis of micro-economics.

ECN 502. ECONOMIC NATIONAL INCOME THEORY (3)
PR: ECN 501. Analytical and policy aspects of macroeconomic theory.

ECN 503. STATISTICS OF BUSINESS (3)
PR: ECN 231, MTH 211 or equivalent. The analysis and interpretation of quantitive data pertinent to the solutions of economic problems.

ECN 531. ACTIVITY ANALYSIS (5)
PR: MTH 213, ECN 331, and CI. Selected topics in economic theory are analyzed with the aid of linear programming, input-output analysis, game theory, etc. Quantitative and mathematical techniques useful in analyzing economic decision-making including mathematical programming, queueing theory and simulation methods are applied to economic control systems.

ECN 561. ECONOMETRICS (5)
PR: ETK 301 or CI, and ECN 301, 323, 331, 361. An advanced discussion of simple multiple regression and correlation analysis, miscellaneous regression problems, applications in statistical demand functions, and production and cost analysis. Simultaneous equation models in macro-economics.

FOR GRADUATE STUDENTS ONLY

ECN 601. RESEARCH METHODOLOGY (3)
PR: ECN 331 or 503 or equivalent. An investigation of research concepts, objectives, and methods including an introduction to linear programming, game theory, and end-use analysis.

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 I (3)
PR: ECN 331 and 503, or equivalent. The use of economic and business data in managerial control and analysis with an introduction to forecasting. Collection and presentation of data, tables, charts, index numbers, linear and nonlinear secular trends, constant and changing periodic movements, and estimating cyclical fluctuations.

ECN 604. MANAGERIAL STATISTICS II (3)
PR: ECN 331 or 503, or equivalent. Simple and multiple correlation and regression analysis with applications in estimating and forecasting and an introduction to the use of statistical inference in managerial decisions.

ECN 605. MICRO-ECONOMICS (3)
PR: ECN 201-202, or equivalent. An investigation of the concepts, tools and methods of micro-economics analysis.

ECN 607. AGGREGATE ECONOMICS (3)
PR: ECN 605. An analysis of monetary and fiscal policy measures designed to moderate economic fluctuations. The theory of national income determination.

ECN 608. APPLIED ECONOMIC ANALYSIS (3)
PR: ECN 605-607. The application of micro and macro principles to business decision-making.

ECN 610. MANPOWER ECONOMICS SEMINAR (5)
PR: ECN 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 unemployment. This background then allows for further study of the causes and remedies for unemployment and underemployment.

ECN 623. PUBLIC FINANCE (5)
PR: ECN 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, income distribution, stability and economic growth.

**ECN 625. MONETARY THEORY (5)**
PR: ECN 605, 607. An advanced discussion of the impact of the financial section upon real economic magnitudes. The course emphasizes theoretical and empirical contribution found in the current literature as an extension of earlier work done in the field of monetary theory.

**ECN 699. THESIS (6-9)**
PR: CC.

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**EDUCATION**


*Associate Faculty:* Francis Allen, Ruth Allen, Brightwell, Brost, Coker, Colby, Cole, Commaratta, Eaker, French, Freijo, Hirshorn, Holmbraker, Jones, Joost, Kimmel, Kinsey, Lightfoot, Nesman, Peterson, Rehhun, Register, Roberts, Robertson, Royston, Shanberg, Sorenson, Sperry, Stevens, Stewart, Jean Stovall, Tidwell, Towery, Young.

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**Art Education**

**EDA 377. THEORETICAL BASES IN ART EDUCATION (3)**
A study of the philosophical psychological and historical bases upon which contemporary art education practice is developed.

**EDA 379. ART IN THE ELEMENTARY SCHOOL (3)**
PR: EDA 377. Art expressions appropriate for elementary school pupils at each grade level. EDA 498 to be taken concurrently.

**EDA 441. TEACHING METHODS IN THE SECONDARY SCHOOL ART (4)**
PR: EDA 377. Techniques and materials of instruction in art, on the secondary level. EDA 498 to be taken concurrently.

**EDA 498. FIELD WORK IN ART EDUCATION (2-6)**
PR: CI. Supervised participation in activities related to art education in community centers, non-school youth programs, planned workshops and research.

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**FOR GRADUATE STUDENTS ONLY**

**EDA 660. HISTORICAL AND PHILOSOPHICAL FOUNDATIONS 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 CI. Literature and research in art education. Various approaches to problem solving and evaluation with emphasis on individual research.

Curriculum

EDC 101. INTRODUCTION TO TEACHING (4)
PR: Freshman only or CI. 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.

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 480. DIRECTED STUDY (1-4)
Extension of competency in teaching field.

EDC 481. INDIVIDUAL RESEARCH (1-4)
PR: Senior standing and consent of program coordinator.

EDC 485. DIRECTED READINGS (1-4)
PR: Senior standing and consent of program coordinator. 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 student teaching.

EDC 499. SUPERVISED TEACHING (1-12)
One full quarter of student teaching in a public or private school. Student teacher 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.

FOR SENIOR LEVEL 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 515. DIRECTING SPEECH ACTIVITIES IN THE SECONDARY SCHOOL (4)
Coaching and directing co-curricular activities in discussion, debate, oratory, oral interpretation, and extemporaneous speaking. Planning and supervision of forensic tournaments and speech contests.

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.

FOR GRADUATE STUDENTS ONLY

EDC 601. THEORETICAL ISSUES IN CURRICULUM AND INSTRUCTION (4)
PR: 8 quarter hours at the graduate level in the Foundation 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 (4)
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 (4)
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 681. DIRECTED STUDY: (Subject) (1-4)
Extension of competency in teaching field.

EDC 683. 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 (4-9)
PR: CI. Supervised teaching at the secondary or junior college level as appropriate.

EDC 699. THESIS (1-9)

EDC 781. GRADUATE RESEARCH (1-5)
PR: CC. Directed study related to educational research, including participation in regular seminars. May be repeated for credit to a maximum of 15 hours.

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 (1-5)
PR: CC. May be repeated for credit to a maximum of 15 hours.

Elementary Education

EDE 409. READING FOR THE CHILD (5)
PR: CBS 101-102. Readiness, word recognition, (phonic, visual and contextual analysis) development of word meanings, basic study skills, comprehension abilities and reading interests.

EDE 411. LANGUAGE ARTS FOR THE CHILD (4)
PR: CBS 101-102. 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)

EDE 415. ARITHMETIC FOR THE CHILD (5)
PR: CBS 105, 106, 107 or 109, 110. Basic structure of arithmetic, principles underlying number concepts.

EDE 417. SCIENCE FOR THE CHILD (5)

EDE 419. SOCIAL STUDIES FOR THE CHILD (5)
PR: CBS 301, 302, 303. 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: Any three CBS Humanities courses. Art and the intellectual, creative, emotional, and esthetic growth of children.

EDE 423. MUSIC FOR THE CHILD; SKILLS (2)
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: Any three CBS Humanities courses, 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)
Motivating factors of play; knowledge and skill in basic rhythmic activities; games and stunts; health instruction for the child.

EDE 426. CREATIVE ARTS IN EARLY CHILDHOOD EDUCATION (3)
The development of the child's creative expression through art, music, dance, play, and drama: included are the materials, content, and teaching techniques.

EDE 431. ART FOR EARLY CHILDHOOD (3)
Art, presenting the principles, practices and materials to be used in relation to the characteristics of the young child ages 3-8.

EDE 433. MUSIC FOR EARLY CHILDHOOD (3)
Singing, rhythmic, creative, instrumental and listening experience relevant to early-childhood.

EDE 440. TEACHING METHODS IN THE ELEMENTARY SCHOOL (4)
Suggested Co-requisite: EDC 401. Process of teaching elementary school subjects. To be taken quarter prior to internship.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

EDE 515. 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 — group and individual.

EDE 516. PRACTICUM IN DIAGNOSIS AND TREATMENT OF CHILDREN'S LEARNING DISABILITIES IN MATHEMATICS (4)
PR: EDE 515. Supervised conduct of a case study with a child experiencing learning difficulties in mathematics. Procedures used and reporting practice employed developed in EDE 515 reviewed and extended.

EDE 519. SOCIAL GROWTH IN CHILDHOOD (4)
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)
The normal processes of development among children ages 3-8, the relation between these characteristics and the curriculum: child study through observation required.

EDE 529. PROGRAMS IN EARLY CHILDHOOD EDUCATION (5)
A study of school programs for nursery, kindergarten, and primary education. Analysis and evaluation of these programs in the light of the most effective current classroom practices. Observation and participation included.

EDE 531. LANGUAGE AND LEARNING IN EARLY CHILDHOOD (4)
A study of the successive stages of development in language and learning during the child's formative years. Theories of learning and of language development.

EDE 539 WORKSHOP IN EARLY CHILDHOOD EDUCATION (4)
Individual problems and innovations related to methods and materials of instruction in the early childhood grades.

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 schools.
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 641. PROBLEMS IN SUPERVISION (4)
PR: EDF 607 or equivalent and EDC 661. Problems in supervising for curriculum improvement within the elementary school.

EDE 687. SUBJECT SPECIALIZATION PLANNING: ELEMENTARY (4)
Individually planned course in an elementary school subject area for in-service teachers.

Foundations

EDF 303. INTRODUCTION TO MEASUREMENT AND EVALUATION (4)
Elementary concepts basic to a general understanding of measurement and evaluation procedures. Students may not receive credit for both EDF 303 and PSY 413, Tests and Measurements in Psychology.

EDF 305. HUMAN DEVELOPMENT AND LEARNING (4)
PR: CBS 201, 203, and 75 hours completed. Physiological and psychological growth patterns; learning theories, personality adjustment, and appraisal of the various forces affecting learning and personality. Credit cannot be earned for both EDF 305 and EDF 377. Should not be taken concurrently with EDF 307.

EDF 307. SOCIAL FOUNDATIONS OF EDUCATION (4)
PR: 75 hours completed. 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)
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 377. EDUCATIONAL PSYCHOLOGY (4)
The nature of learning and the application of learning principles to educational procedures. Credit cannot be earned for both EDF 305 and EDF 377.

FOR SENIOR LEVEL 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
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 606. principles of teaching (4)
Principles for teaching in the several academic subjects.

for graduate students only

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 cl. 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 as its influence upon learning and behavior.

Edf 617. measurement of individual intelligence (5)
Pr: Edf 305 or 611 or equivalent and a course in educational measurement or 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.

Guidance

for upper level undergraduates

Edg 401. pupil personnel services in the schools (5)
An introduction to the role and function of guidance, school psychology, social work and other pupil personnel services from kindergarten through junior college.

for graduate students only

Edg 581. principles of guidance (4)
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 581. Occupational structure in the United States; sources and uses of educational, occupational, social and personal information; collecting, classifying and communicating such information.

EDG 607. THE INDIVIDUAL INVENTORY SERVICE IN GUIDANCE (3)
PR: EDG 581. Case study approach to the analysis of the individual with emphasis on collecting and using information for purposes of better understanding individuals.

EDG 611. THE TESTING SERVICE IN GUIDANCE (4)
PR: EDF 605 or equivalent and EDG 581. Measurement in guidance; administration of tests, interpretation and use of results.

EDG 613. ORGANIZATION AND ADMINISTRATION OF GUIDANCE SERVICES IN ELEMENTARY SCHOOLS (3)
PR: EDG 581. 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 581. 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 IN ELEMENTARY SCHOOLS (3)
PR: EDG 581 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 581 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. THE COUNSELING SERVICE IN GUIDANCE IN SECONDARY SCHOOLS (5)
PR: EDG 581. 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.

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.

EDG 629. COMPARATIVE GUIDANCE (4)
PR: EDG 581 (or equivalent) or CI. Guidance theory and practice in foreign countries; for example, guidance theory and practice in the Soviet block countries, Marxist ethics, socialist character formation, the role of ideology, collectivist lifestyle, leadership requirements, hierarchy of individual and societal goals. Orthodox theory versus reformist currents. Evaluation of Marxist guidance through critical analysis of primary source materials.

EDG 633. SEMINAR IN GUIDANCE (1)
PR or CR: EDG 581. Significant issues in the field of guidance; topics for discussion will vary according to needs and interests of students.
Junior College

FOR GRADUATE STUDENTS ONLY

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

EDL 411. SCHOOL LIBRARY ADMINISTRATION AND SERVICE (5)
Development, philosophy, objectives, standards and current trends in school libraries. Introduction to library operations, programs and services in the school and in the community.

EDL 412. ORGANIZATION OF THE SCHOOL LIBRARY AS A MATERIALS CENTER (5)
Media quarters (materials center), facilities and equipment. The application of the principles of library organization and service to the administration and service of all media in the school.

EDL 419. AUDIOVISUAL MATERIALS OF INSTRUCTION (4)
Selection, utilization and care of audiovisual materials and equipment.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

EDL 508. TV UTILIZATION IN AND FOR THE SCHOOL (4)
Utilization of open and closed circuit broadcasting in the instructional process.

EDL 513. GENERAL REFERENCE SOURCES (4)
Basic reference tools: dictionaries, encyclopedias, handbooks, indexes, serials, bibliographies, biographical sources, atlases and gazetteers; emphasis on school library reference materials.

EDL 514. SELECTION AND ACQUISITION OF ELEMENTARY SCHOOL LIBRARY MATERIALS (4)
Selection and ordering of books and audiovisual materials for children, grades K-6.

EDL 515. TECHNICAL SERVICES IN LIBRARIES (4)
Principles and practice in the classification, cataloging and processing of books for the school library.

EDL 517. BOOKS AND RELATED MATERIALS FOR YOUNG PEOPLE—Part I (3)

EDL 518. BOOKS AND RELATED MATERIALS FOR YOUNG PEOPLE—Part II (3)
PR: EDL 517. Examination of books and related materials for young people in terms of basic principles of selection and utilization.

EDL 523. PREPARATION AND PRODUCTION OF INSTRUCTIONAL MATERIALS (4)
Basic techniques for the preparation of a variety of audiovisual instructional materials.

EDL 524. STORYTELLING FOR ELEMENTARY SCHOOL CHILDREN (4)
Review of the literature of storytelling; criteria in selection of storytelling materials; practice in using the arts and skills of oral communication in transmitting the literary heritage to young children.
FOR GRADUATE STUDENTS ONLY

EDL 600. FOUNDATIONS OF LIBRARIANSHIP (5)
PR: EDL 411 or its equivalent. 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.

EDL 601. BIBLIOGRAPHY AND BOOK SELECTION (5)

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. HISTORY OF BOOKS AND PRINTING (4)
PR: EDL 600 or consent of the instructor. The making of books from earliest times to the beginning of the Twentieth Century, including the manuscript book, the invention and spread of printing, type design, methods and styles of illustration.

EDL 604. CONTEMPORARY PUBLISHING AND PRINTING (4)

EDL 605. HISTORY OF CHILDREN'S LITERATURE (5)
Historical bibliographical survey of imaginative and informational literature for children.

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 609. SUPERVISED FIELD WORK IN SCHOOL LIBRARIES (4)
PR: Consent of major adviser.

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 SUBJECT REFERENCE AND BIBLIOGRAPHY (4)
PR: EDL 513. Literature of the humanities, social sciences, science, and technology.

EDL 612. THE ORGANIZATION AND ADMINISTRATION OF THE SCHOOL MEDIA CENTER (5)
PR: EDL 600 or its equivalent. Media quarters, facilities and equipment. Basic principles of organization and administration of media programs in elementary and secondary schools.

EDL 615. CLASSIFICATION AND CATALOGING OF NON-BOOK MATERIALS (3)
Principles and practice in the cataloging of non-book materials for the media center.

EDL 616. ADVANCED CATALOGING AND CLASSIFICATION (TECHNICAL PROCESSES) (4)
PR: EDL 515 or consent of the instructor. 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 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 621. AUDIOVISUAL ADMINISTRATION (5)
PR: EDL 523 and 607. Audiovisual administrative practices in school systems and junior colleges.

† Only two out of sequence EDL 602, 603, 604 may be taken for any one program.
EDL 622. PROBLEMS IN AUDIOVISUAL UTILIZATION FOR NON-SCHOOL LIBRARIANS (4)
Examination of non-print media and its utilization in non-school libraries. Characteristics of media equipment and paradigms of use.

EDL 623. ADVANCED PREPARATION AND PRODUCTION OF INSTRUCTIONAL MATERIALS (4)
By permission of instructor. Designed for the media specialist. Advanced techniques for the preparation of audiovisual materials of instruction.

EDL 625. READING GUIDANCE PROGRAMS IN LIBRARIES AND CLASSROOMS (4)
The factors and forces that influence reading interests and habits of youth; programs for teaching the investigative and library skills; the materials and methods for the guidance of reading, grades 1-12.

EDL 629. RADIO AND TELEVISION TECHNIQUES FOR EDUCATORS (4)
Utilization and broadcasting techniques for educators. Stress will be placed on local school production, micro-teaching, and studio broadcasting.

EDL 630. BIBLIOGRAPHY OF THE HUMANITIES (4)
PR: EDL 513 and EDL 611 or consent of the instructor. 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. Emphasis upon the importance of creative literature in all libraries, illustrated by specific readings.

EDL 631. BIBLIOGRAPHY OF THE SOCIAL SCIENCES (4)
PR: EDL 513 and EDL 611 or consent of the instructor. 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. BIBLIOGRAPHY OF THE SCIENCES AND TECHNOLOGIES (4)
PR: EDL 513 and EDL 611 or consent of the instructor. 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. ADMINISTRATION AND PERSONNEL SERVICES IN THE PUBLIC LIBRARY (5)
Identification of problems and critical examination of methods in administrative areas of technical and public services, fiscal, and legal responsibilities, staff organization and supervision in public libraries.

EDL 650. ADMINISTRATION AND PERSONNEL SERVICES IN THE ACADEMIC LIBRARY (5)
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 681. INDIVIDUAL RESEARCH AND INDEPENDENT STUDY (1-5)
PR: 20 hours earned in program and consent of adviser.

Music Education

*EDM 431. INSTRUMENTAL MUSIC IN THE ELEMENTARY SCHOOL (5)
*EDM 432. INSTRUMENTAL MUSIC IN THE JUNIOR HIGH SCHOOL (5)
*EDM 433. INSTRUMENTAL MUSIC IN THE SENIOR HIGH SCHOOL (5)
*EDM 435. VOCAL MUSIC IN THE ELEMENTARY SCHOOL (5)
*EDM 437. VOCAL MUSIC IN THE JUNIOR HIGH SCHOOL (5)
*EDM 439. VOCAL MUSIC IN THE SENIOR HIGH SCHOOL (5)

FOR GRADUATE STUDENTS ONLY

EDM 601. TECHNIQUES OF RESEARCH IN MUSIC EDUCATION (4)
Professional bibliography and individual research projects.

* 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.
EDM 603. MUSIC SUPERVISION AND ADMINISTRATION (3)
The music curriculum in relation to the total school program; staff and budgetary needs.

EDM 605. THE TEACHING OF MUSIC LITERATURE (3)
Music literature appropriate for grades K-12 and methods of presentation to develop music concepts and sensitivity.

EDM 614. VOCAL MATERIALS AND CONDUCTING (4)
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 (4)
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 (3)
New materials, equipment, techniques of teaching and recent historical trends in instrumental music.

EDM 635. CURRENT TRENDS IN SCHOOL VOCAL MUSIC (3)
New materials, equipment, techniques of teaching and recent historical trends in vocal music.

Natural Science – Mathematics

EDN 425. NEW TRENDS IN TEACHING THE PHYSICAL SCIENCES (4)
Physical Science Study Committee Physics, Chemical Education Materials Study and other new approaches to the teaching of the physical sciences. Recommended for teachers of Physics, Chemistry and Earth Sciences.

EDN 427. NEW TRENDS IN TEACHING BIOLOGY (4)
Recent developments in curriculum materials and in strategies for teaching biological sciences, grades 7-12. Recommended for pre-service teachers of secondary school biology.

EDN 451. TEACHING METHODS IN THE SECONDARY SCHOOL—MATHEMATICS (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in mathematics.

EDN 459. TEACHING METHODS IN THE SECONDARY SCHOOL—SCIENCES (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in secondary schools sciences.

EDN 515. THE UTILIZATION OF LABORATORY TECHNIQUES IN THE TEACHING OF MATHEMATICS (4)
PR: 18 quarter hours of mathematics or CI. In this course students will make an examination of a variety of sample laboratory lessons along with methods for creating and evaluating such lessons.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

EDN 583. SELECTED TOPICS IN SCIENCE EDUCATION (1-5)
May be repeated when topics are not duplicated.

FOR GRADUATE STUDENTS ONLY

EDN 616. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS I (5)
PR: 18 quarter hours of mathematics or CI. Development of strategies and materials for teaching mathematical concepts and skills appropriate to presecondary school years.

EDN 617. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS II (5)
PR: EDN 616. Continuation of EDN 616.

EDN 618. TEACHING OF PRE-SECONDARY SCHOOL MATHEMATICS III (5)
PR: EDN 617. Continuation of EDN 616-617.
EDN 621. TEACHING OF HIGH SCHOOL ALGEBRA (4)
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 (4)
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 (4)
Curricular patterns and instructional practices in secondary mathematics.

EDN 639. CURRENT TRENDS IN SECONDARY SCIENCE EDUCATION (4)
PR: EDN 425 or 427. Curricular patterns and instructional practices in secondary science.

EDN 641. CASE STUDIES IN SCIENCE (4)
Case studies from the Natural Sciences with implications for science teaching.

EDN 651. TEACHING SECONDARY SCHOOL BIOLOGY (4)
PR: CI. Effective use and production of instructional materials in the biological sciences. Interrelation of philosophy, materials and classroom practices.

EDN 653. TEACHING SECONDARY SCHOOL PHYSICAL & EARTH SCIENCES (4)
PR: CI. Effective use and production of instructional materials in the physical and earth sciences. Interrelation of philosophy, materials, and classroom practices.

Physical Education

*EDP 255. FIRST AID (3)
Meets American Red Cross certification requirements in standard and advanced first aid.

*EDP 311. SEMINAR AND FIELD EXPERIENCE IN PHYSICAL EDUCATION (5)
Approximately two hours per day are 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.

*EDP 312. HUMAN KINETICS I (6)
The development and integration of the neuromuscular and the associated 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 314. INDIVIDUAL ASSESSMENT (2)
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 (5)
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 (6)
The structure and function of the nervous, skeletal, and muscular systems of the human body as they contribute to efficient movement; deviations in either structure or function in these systems and the role of exercise in rehabilitation.

*EDP 331. SEMINAR AND INTERNSHIP IN PHYSICAL EDUCATION (5)
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 (6)
The mechanical laws of physics as they relate to movement within and of the human

* Enrollment in these courses requires admission to the Physical Education Program.
body and the projection of objects in throwing, hitting, and kicking. Efficiency of human movement through sound body mechanics.

*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)
Students spend approximately two hours a day at either the junior or senior high school level working in team teaching situations. Emphasis is placed on understanding the secondary level student and how teaching behavior can affect the learner.

*EDP 412, 422, 432. APPLIED HUMAN KINETICS (4 each)
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)
Students reverse teaching levels from EDP 411 so that they will have experience at both junior and senior high school levels. Team teaching prevails, however, a transition is made to teaching larger numbers of students. Seminars emphasize individualization techniques.

*EDP 431. SEMINAR AND INTERNSHIP IN PHYSICAL EDUCATION (5)
Students have an option of teaching at the elementary, junior or senior high school level as well as teaching mentally retarded students. Students will teach for a full day for a period of from one to three weeks.

EDP 459. ATHLETIC TRAINING (3)
PR: CI. 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: CI. 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 involved 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 SENIOR LEVEL AND GRADUATE STUDENTS

EDP 556. SPECIAL PROBLEMS IN PHYSICAL EDUCATION (3-6)
* Enrollment in these courses requires admission to the Physical Education Program.
EDP 558. SCIENTIFIC BASIS OF COACHING (5)
The application of principles from exercise physiology, kinesiology, and psychology to competitive athletics.

EDP 566. PHYSICAL EDUCATION FOR THE MENTALLY RETARDED (4)
An analysis of the neuromuscular and perceptual motor development of children in regard to the special problems of the mentally retarded child and a study of activities designed to improve his motor skills, physical fitness, and social development.

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.

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 psychoeducational 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.

EDP 699. RESEARCH THESIS (1-9)
Measurement – Research – Evaluation

FOR GRADUATE STUDENTS ONLY

EDQ 601. ADVANCED MEASUREMENT—COGNITIVE AREA (4)
Measurement, assessment theory and procedures appropriate to the “Cognitive Domain”, i.e., intellectual abilities, aptitudes, achievements, skills.

EDQ 603. ADVANCED MEASUREMENT—AFFECTIVE AREA (4)
Measurement, assessment theory and procedures appropriate to the affective domain, i.e., feelings, attitudes, interests, personal characteristics.

EDQ 604. 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 such issues as culture fair testing, accountability, assessment of change, decision theory, nature of human abilities, normative vs. criterion measures, and current socio-political issues in measurement and evaluation.

EDQ 605. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH I (4)
Application of statistical techniques to the study of education problems: Tests of significance and confidence intervals, analysis of variance (one-way and factorial), correlation and linear regression.

EDQ 607. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH II (4)
Application of statistical techniques to the study of educational problems: Multiple correlation and regression, Introductory Factor Analysis and selected non-parametric techniques.

EDQ 608. STATISTICAL ANALYSIS FOR EDUCATIONAL RESEARCH III (4)
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).

EDQ 609. DESIGN OF EXPERIMENT-PRODUCT RESEARCH IN EDUCATION (4)
Basic Experimental research design theory and models appropriate for education.

EDQ 611. DESIGN OF DESCRIPTIVE-PROCESS RESEARCH (4)
Theory and procedures for conducting descriptive research in education.

EDQ 612. ANALYSIS OF DEMOGRAPHIC DATA FOR EDUCATIONAL RESEARCH
Fundamental procedures for the study and use of demographic data relevant to educational decisions.

EDQ 613. COMPUTER PROGRAMMING FOR EDUCATIONAL RESEARCH
Computer Solution of Educational Research and Administrative related Problems using FORTRAN as a programming language.

EDQ 620. PLANNING EVALUATION AND DEVELOPMENT IN EDUCATION (4)
The major theories, models and issues related to planning evaluation and development will be studied, discussed and evaluated. Practical experience will be gained in preparing planning proposals and evaluative reports. Emphasis will be placed on applied aspects related to conducting planning, evaluation and development activities in operational settings.

EDQ 621. SYSTEMS APPROACHES TO EDUCATIONAL PLANNING AND DEVELOPMENT (4)
The course will involve a study of primary materials presenting the basic theoretical formulations of systems approaches. The transition from theory to practice will be made by involving students in specific exercises and experiences involving systems procedures. Upon completion of the course, participants will be able to apply systems approaches to educational problems.
Reading Education

FOR SENIOR LEVEL AND GRADUATE STUDENTS

EDR 509. CURRENT TRENDS IN READING IN THE SECONDARY SCHOOL (4)
Developmental reading for the upper grade level junior high school pupils and all grade level senior high school pupils.

EDR 530. CORRECTIVE READING FOR CLASSROOM TEACHERS (4)
PR: EDE 409 or EDR 509 or equivalent. Procedures and materials for individual and group corrective reading in the classroom.

FOR GRADUATE STUDENTS ONLY

EDR 631. DIAGNOSIS OF READING DISABILITIES (4)
PR: EDF 605 and EDE 609 or EDR 509. Research concerning causes of reading disability; diagnostic procedures; techniques and materials in diagnosis of reading problems.

EDR 632. TECHNIQUES OF CORRECTIVE AND REMEDIAL READING (4)
PR: EDE 609 or EDR 509, and EDR 631. Materials and methods in remediation of moderate to severe reading disability cases.

EDR 633. PRACTICUM IN READING (3-6)
PR: EDE 609 or EDR 509, EDR 631 and EDR 632 and CI. Clinical diagnosis 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 or EDR 509. 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 601, EDE 609 or EDR 509. Critical analysis of current reading research; individual report or paper required.

Special Education

*EDS 211. INTRODUCTION TO SPECIAL EDUCATION (3)
Characteristics of exceptional children and professional opportunities available in Special Education.

*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 312. COMMUNICATION DISORDERS IN THE CLASSROOM (4)
Aiding the child with a speech, hearing, or language disorder in a classroom setting.

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 (6)
Supervised Practicum experiences in the educational, social and vocational planning of mentally retarded individuals.

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 423 I & II. EDUCATIONAL PROCEDURES FOR THE EDUCABLE MENTALLY RETARDED (4,4)
PR: EDS 322, EDC 401, or CI. Special class organization, curriculum adjustments, methods and techniques of teaching the educable retarded.

* EDS 211 restricted to freshmen and sophomores; EDS 311 restricted to juniors and seniors. Credit cannot be received for both courses.
EDS 424. EDUCATIONAL PROCEDURES FOR THE TRAINABLE MENTALLY RETARDED (4)
PR: EDS 322 or CI. Special class organization, curriculum adjustments, methods and techniques of teaching the trainable retarded.

EDS 479. SCHOOL PRACTICUM IN SPEECH PATHOLOGY (1-14)
Supervised practicum in Speech Pathology & Audiology in the school setting.

FOR SENIOR LEVEL 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 201 or CI. 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 CI. Curriculum adjustments, methods and techniques, classroom organization necessary for teaching the gifted.

EDS 552. CREATIVE PROBLEM SOLVING FOR THE GIFTED (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.

EDS 559. FIELD WORK FOR THE GIFTED (1-14)
Planned supervised participation in activities related to specific areas of the gifted.

EDS 561. EDUCATIONAL PROBLEMS OF THE PHYSICALLY HANDICAPPED (4)
PR: EDS 311 or CI. Introduction to the educational, psychological and social problems of the physically disabled child in the public schools.

EDS 579. SCHOOL PRACTICUM IN SPEECH PATHOLOGY (1-14)
Supervised practicum in Speech Pathology & Audiology in the school setting.

FOR GRADUATE STUDENTS ONLY

EDS 610. SEMINAR IN SPECIAL EDUCATION (4)
A critical survey of the literature related to the psychological, sociological, and educational problems of exceptional children.

EDS 611. PSYCHO-EDUCATIONAL APPRAISAL OF EXCEPTIONAL CHILDREN (4)
PR: EDF 303, 605, or CI. Educational planning for exceptional children based on diagnostic information.

EDS 612. SUPERVISION OF EXCEPTIONAL CHILD PROGRAMS (4)
PR: CI. Principles of supervision and their application to exceptional child education.

EDS 613. ADMINISTRATION OF EXCEPTIONAL CHILD PROGRAMS (4)
PR: CI. Procedure which local, state, and national administrators may use to implement services for exceptional children.

EDS 620. BIOLOGICAL AND PSYCHOLOGICAL ASPECTS OF MENTAL RETARDATION (4)
PR: EDS 322 and EDF 607, or CI. Evaluation of relevant literature.
EDS 621. SOCIOLOGICAL AND EDUCATIONAL ASPECTS OF MENTAL RETARDATION (4)
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 CI. Specific curriculum and methodological problems in teaching the retarded.

EDS 632. EDUCATIONAL PROGRAMMING FOR EMOTIONALLY DISTURBED CHILDREN I (4)
PR: EDS 531 and CI. 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 CI. Personality dynamics and learning theory as 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 CI. Supervised graduate practicum experiences with emotionally disturbed children.

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 660. THE VISUALLY HANDICAPPED IN THE CLASSROOM (4)
PR: EDS 311 or CI. A survey of modern techniques to assist teachers in a broader understanding of the recognition of visual problems. Hygiene, structure and educational implications.

EDS 662. EDUCATIONAL PROBLEMS OF THE PHYSICALLY HANDICAPPED (4)
PR: EDS 311 or CI. Introduction to the educational, psychological and social problems of the physically disabled child in the public schools.

EDS 676. SPEECH & LANGUAGE DISORDERS (4)
Group management procedures for amelioration of speech and language problems. The nature of disorders of communication and management of verbal behavior.

English

EDT 447. TEACHING METHODS IN THE SECONDARY SCHOOL—ENGLISH (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in English Education.

EDT 463. TEACHING METHODS IN THE SECONDARY SCHOOL JOURNALISM (4)
PR: EDC 401 or concurrent registration in EDC 401. Techniques and materials of instruction in journalism.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

EDT 531. CURRENT TEACHING OF THE ENGLISH LANGUAGE (4)
Application of recent techniques of language study, including structural and transformational grammar, to classroom teaching of English, especially in relation to current textbooks. (For graduate credit: PR: ENG 517 or ENG 535 and certification in English.)

FOR GRADUATE STUDENTS ONLY

EDT 621 CURRENT CURRICULAR TRENDS IN TEACHING SPEECH COMMUNICATIONS (5)
PR-CI: Curricular patterns; instructional materials, facilities and practices used in teaching speech communications.
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.

EDT 631. CURRENT TRENDS IN SECONDARY ENGLISH EDUCATION (4)
Curricular patterns and instructional practices in secondary English.

Vocational and Adult Education

EDV 141. INTRODUCTORY TYPEWRITING (3)
Basic skills of typewriting for personal use, common types of business letters, manuscripts, reports and tabulated materials. Credit by examination may be given to those students who have had less than one year prior instruction in typewriting.

EDV 143. ADVANCED TYPEWRITING (3)
Development of speed and accuracy, and a continuation of skill building procedures in production typewriting, emphasizing mailable transcripts.

EDV 251. INTRODUCTORY SHORTHAND (5)
PR: EDV 141 or equivalent. Introduction to basic skills and vocabulary in the Diamond Jubilee series of Gregg Shorthand.

EDV 252. INTERMEDIATE SHORTHAND (4)
PR: EDV 143, 251 or equivalent of each. Review of basic skills and vocabulary and emphasis on dictation speeds.

EDV 351. ADVANCED SHORTHAND DICTATION AND TRANSCRIPTION (4)
PR: EDV 143 and 252, or equivalent of each. Emphasis on advanced dictation speeds and transcription of mailable business communications.

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, principles of office organization, and planning for office equipment and supplies.

EDV 361. BUSINESS AND OFFICE MACHINES (5)
Instruction and practice on selected business and office machines to acquaint students with capabilities and limitations of the machines.

EDV 407. 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.

EDV 431, SUPERVISED FIELD EXPERIENCE: (Specialization) (4-8)
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.

EDV 461. OFFICE OCCUPATIONS PROCEDURES (5)
PR: EDV 143, 351, 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: (Specialization) (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.

* Areas of specialization in these courses are: Adult Education, Business Education, Distributive Education, and Industrial-Technical Education.
FOR SENIOR LEVEL AND GRADUATE STUDENTS

*EDV 503. LEARNING AND 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:
   (Specialization) (4)
   The development of selected instructional materials, use of new educational media, performance evaluation instruments, and counseling techniques.

*EDV 506. PROGRAM MANAGEMENT: (Specialization) (4)
   Organization, co-ordination, and budgeting of adult, co-operative, and special programs.

EDV 507. 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.

EDV 511. SCHOOL-COMMUNITY DEVELOPMENT (4)
An approach to identifying and analyzing, developing and maintaining working relationships between appropriate school and community institutions, their channels of communication for the purpose of cooperative program involvement.

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: (Specialization) (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: (Specialization) (4)
Historical information, issues, current trends, new dimensions and problems in the area of specialization.

*EDV 641. STAFF DEVELOPMENT: (Specialization) (4)
Implementation of new procedures addressed to discreet developmental needs of the staff as identified by an educational agency.

*EDV 651. PRACTICUM: (Specialization) (4-8)
A problem-centered field study in the local community, school, government, office, social agency, business or industry.

EDV 661. SUPERVISION OF LOCAL PROGRAMS: ADULT OR VOCATIONAL (4)
PR: CI. A study of the factors involved in the supervision of instruction including plans for teacher education, improvement of instruction, coordination of activities, and personnel relations.

EDV 671. ADMINISTRATION OF LOCAL PROGRAMS: ADULT OR VOCATIONAL (4)
A study of the organization, selection of personnel, assignment of duties and responsibilities, and establishment of policies and procedures to accomplish the objectives of the local program within the federal, state, and local requirements.

*EDV 687. SEMINAR: (Specialization) (4)
PR: EDF 605 & 607. Applied research techniques and investigation of important current issues or theses in the area of specialization.

Social Studies

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.

* Areas of specialization in these courses are: Adult Education, Business Education, Distributive Education, and Industrial-Technical Education.
FOR GRADUATE STUDENTS ONLY
EDW 643. CURRENT TRENDS IN SECONDARY SOCIAL STUDIES (4)
Curricular patterns and instructional practices in secondary social studies.

Foreign Languages

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.

Humanities

FOR GRADUATE STUDENTS ONLY
EDY 633. CURRENT TRENDS IN THE TEACHING OF HUMANITIES (4)
Curricular patterns, materials, and instructional practices in the teaching of humanities.

ENGINEERING


Basic Engineering Course Work

EGB 101. GRAPHIC ANALYSIS I (4)
The theory and application of projective systems and related topics. Basic problems in descriptive geometry. (lec-lab)

EGB 102. GRAPHIC ANALYSIS II (3)

EGB 103. GRAPHIC ANALYSIS III (3)
CR: 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)
CR: EGB 102. Continuation of EGB 103.

EGB 201. ENGINEERING PROBLEMS I (2)
EGB 203. ENGINEERING MEASUREMENTS (3)
PR: EGB 102. An introduction to the concepts of a systems approach and various techniques of measurement in engineering systems, both discrete and continuous. (lec-lab)

EGB 231. PROGRAMMING I—INTRODUCTION (1)
Basic computer operation, programming a computer using machine language, assembly languages and FORTRAN.

EGB 232. PROGRAMMING II—FORTRAN (2)
PR: EGB 231. Continuation of EGB 231.

EGB 301. ENGINEERING PROBLEMS II (2)
CR: MTH 303. Continuation of EGB 201.

EGB 302. ENGINEERING PROBLEMS III (2)
CR: MTH 304. Continuation of EGB 301.

EGB 303. ENGINEERING PROBLEMS IV (2)
CR: MTH 305. Continuation of EGB 302.

EGB 311. INTRODUCTION TO ELECTRICAL SYSTEMS I (3)

EGB 312. INTRODUCTION TO ELECTRICAL SYSTEMS II (3)
PR: EGB 311. Continuation of EGB 311.

EGB 313. INTRODUCTION TO ELECTRICAL SYSTEMS II (3)
PR: EGB 311. Continuation of EGB 311 or EGB 312.

EGB 321. THERMODYNAMICS I (3)

EGB 322. THERMODYNAMICS II (3)

EGB 325. DYNAMIC RESPONSE OF ENGINEERING SYSTEMS I (4)
PR: EGB 340, MTH 303. 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-lab).

EGB 337. ENGINEERING VALUATION I (3)
PR: EGB 231, MTH 303. 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 (5)
CR: PHY 221. Principles of statics, equilibrium of rigid bodies, elestostatics of simple structural elements (lec-problem)

EGB 341. SOLID MECHANICS II (4)
PR: EGB 340. Dynamics of discrete particles and distributed mass bodies; spatial kinematics and kinetics. (lec-problem)

EGB 342. ENGINEERING MATERIALS I (6)
PR: CHM 213, EGB 340. An introduction to the structure and properties of engineering materials. (lec-lab)

EGB 343. FLUIDS I (6)
PR: EGB 341. Fundamental and experimental concepts in ideal and viscous fluid theory; momentum and energy considerations; compressible flow; boundary layer, Navier-Stokes equation. (lec-lab)

EGB 401. ENGINEERING ANALYSIS I (4)

EGB 501, 502, 503, 504, 505. ENGINEERING ANALYSIS II, III, IV, V, VI (3 each)
PR: CC or MTH 401. Ordinary differential equations with emphasis on numerical methods and series solutions; boundary value problems; orthogonal functions; vec-
tor analysis; partial differential equations; the LaPlace transform; functions of a com-
plex variable.

ECB 601. ENGINEERING ANALYSIS VII (3)
PR: CC. Applications of applied mathematics to the study of linearized dynamic
systems and networks; state space; stability theory; extensions to discrete and non-
linear systems.

Electrical and Electronic Systems

EGE 301, 302, 303, 404, 405, 406. LABORATORIES 1 through 6 (1 each)
PR: EGB 311, 312; CR: EGE 410, 420, 421, 430, respectively.

EGE 310, 410. NETWORK ANALYSIS AND DESIGN I, II (3 each)
PR: EGB 311. A second course in linear circuit analysis and design. Transient and
steady-state responses of passive R-L-C networks to various forcing functions.

EGE 320, 420. ELECTRONICS I, II (3 each)
PR: EGB 312. A second course in the physical principles of electronic devices with
emphasis on semi-conductor electronics. Includes the analysis and design of ampli-
fiers and switching circuits.

EGE 330, 430. FIELDS AND WAVES I, II (3 each)
PR: PHY 225-226, EGB 401. A basic introduction to electromagnetic field theory,
Including static and dynamic electromagnetic fields.

EGE 404, 405, 406, SEE EGE 301

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 Super-
position integrals.

EGE 420. SEE EGE 320

EGE 421. COMMUNICATION CIRCUITS (3)
PR: EGE 420. Provides further study in electronic circuits. Includes oscillator, modu-
lator, 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 430. SEE EGE 330.

EGE 432. DISTRIBUTED NETWORKS (3)
PR: EGE 330, EGE 410. Transmission lines, standing waves, impedance, wave-
guides.

EGE 440. LINEAR CONTROL SYSTEMS (3)
PR: EGB 325. Introduction to analysis and design of linear feedback control systems.
Covers block diagrams, flow charts, Bode, Nyquist and Root Locus techniques.

EGE 441. CONTROL LABORATORY (1)
CR: EGE 440.

EGE 444, LOGIC DESIGN (3)
PR: EGB 312. 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 450. MICROELECTRONICS ENGINEERING (3)
circuits. Fabrication techniques, component realization, component isolation, para-
sitics.

EGE 451. MICROELECTRONICS LABORATORY (1)
CR: EGE 450.

EGE 460, 462, 464. ELECTROMECHANICS I, II, III (3 each)
PR: EGB 312. Theory of electromechanical energy conversion. Characteristics and
control of rotating electrical machines, transformers, electromagnets, loudspeakers,
microphones, transducers.
EGE 461, 463, 465. ELECTROMECHANICS LAB 1, 2, 3 (1 each)
CR: EGE 460, 462, 464 respectively.
EGE 474, 476, 478. SYSTEMS ANALYSIS I, II, III (5 each)
PR: CC. A course series to permit non-electrical majors to take advanced course work in the electrical area.
EGE 475, 477, 479. SYSTEMS LABORATORIES 1, 2, 3 (1 each)
CR: EGE 474, 476, 478 respectively.
EGE 480, 481, 482. SPECIAL ELECTRICAL TOPICS I, II, III (1-4 each)
PR: CC.
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 44. Digital arithmetic; computer subsystems, arithmetic units; control units; memory units; general purpose computers.
EGE 545. DIGITAL LABORATORY (1)
CR: EGE 544.
EGE 547. DISCRETE STRUCTURES FOR DIGITAL SYSTEMS (3)
PR: EGE 542. Set algebra, basic algebraic structures in computers, boolean algebra, propositional logic, and graphs. Applications to computers.
EGE 548. ELECTRICAL MESURÉMENTS (2)
PR: EGE 411. Techniques and principles of electronic measurement.
EGE 549. MEASUREMENTS LABORATORY (1)
CR: EGE 548.
EGE 560. POWER SYSTEMS ANALYSIS (3)
PR: CC. Analysis techniques for AC power systems.
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
EGE 610, 611. ADVANCED CIRCUIT THEORY I, II (3 each)
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 each)
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 each)
PR: CC. Physical basis and statistical representation of electrical noise; filtering, modulation, and demodulation 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 each)
PR: CC. Electromagnetic theory from the engineering point of view, propagation and reflection of waves, guided waves, resonant activities, 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 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. 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 644. AUTOMATA THEORY I (3)

EGE 645. AUTOMATA THEORY II (3)
PR: EGE 644. Vector spaces over finite fields, linear sequential circuits, pseudo random sequences, turing machines, recursive function, computability.

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 each)
PR: CC. Theory of operation and application of circuits and devices.
EGE 660, 661, 662. ELECTRIC POWER SYSTEMS I, II, III (3 each)
PR: CC. Steady-state and transient analysis of interconnected power systems;
power circuit protection; transient characteristics of apparatus.
EGE 670. PULSE COMMUNICATIONS SYSTEMS (3)
PR: CC. Sampling theory-pulse waveform generation and modulation, PAM,
PWM, PPM, related multiplex systems, telemetry applications.
EGE 671. DATA TRANSMISSION I (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,
polynomial systems, synchronization methods.
EGE 680. SPÉCIAL ELECTRICAL PROBLEMS I (1-3 each)
PR: CC.
EGE 690. ADVANCED ENGINEERING SEMINAR (1)
PR: CC.
EGE 699. RESEARCH OR DESIGN (1-18)
PR: CC.

ENERGY CONVERSION AND MECHANICAL DESIGN

EGR 311. THERMODYNAMICS III (3)
PR: EGB 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 (4)
PR: EGB 322. The basic laws of conduction, convection and radiation; analy­sis of the effect on heat transfer of thermal conductivity, emissivity, fluid trans­port properties and Reynold’s number. (lec-lab)
EGR 326. DYNAMICS OF MECHANICAL SYSTEMS (3)
PR: PHY 221, MTH 303. 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. (lec-lab)
EGR 348. PHYSICAL MEASUREMENTS I (3)
EGR 350. ENERGY CONVERSION LABORATORY I (2)
CR: EGB 322. Introduction to engineering laboratory measurements with emphasis on the writing of technical reports. Experiments in the measurement of concentrations, temperature, pressure, flow of fluids; determination of density, viscosity, diffusivities, analysis of combustion products. (lec-lab)
EGR 411. THERMODYNAMICS IV (3)
PR: EGR 311. Introduction to mathematical thermodynamics, the Maxwell relations, real gas behavior, ideal mixtures and solutions, introduction to phase and chemical equilibrium.
EGR 413. FLUID MACHINERY I (4)
PR: EGB 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 417. FUELS AND COMBUSTION (3)
PR: EGB 322. A study of the combustion characteristics of gaseous, solid and
liquid fuels and equipment needed to safely and economically control combustion processes. (lec-lab).

**EGR 419. POWER PLANT ANALYSIS AND DESIGN (3)**
PR: EGR 311, EGR 315. Parameters 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 (3)**
PR: PHY 323. Neutron density and thermalization parameters; criticality calculations; transient flux parameters; reactor operation; control instrumentation.

**EGR 424. REFRIGERATION AND AIR CONDITIONING (3)**
PR: 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 (3)**

**EGR 429. MECHANICAL DESIGN I (3)**
PR: EGR 326, EGR 428. Application of the principles of engineering mechanics, materials and manufacturing to the analysis and design of mechanical elements. (lec-lab).

**EGR 441. ANALOG COMPUTERS I (3)**
PR: EGB 325, EGR 348 or CI. The study of linear and nonlinear engineering systems using analog computers. Magnitude and time scaling. (lec-lab).

**EGR 445. DYNAMIC RESPONSE OF ENGINEERING SYSTEMS II (3)**

**EGR 450. ENERGY CONVERSION LABORATORY II (1)**
PR: EGR 350. Continuation of EGR 350 with emphasis on measurement techniques, energy balances of operating systems and technical report writing. (lec-lab).

**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. (lec-lab).

**EGR 471. CHEMICAL PROCESS CALCULATIONS (3)**

**EGR 472. TRANSPORT PHENOMENA (4)**
PR: EGR 321, EGR 471. An introduction to momentum transfer, energy transfer, and mass transfer as applied to industrial chemical process problems.

**EGR 473, 474. CHEMICAL PROCESS PRINCIPLES I, II (4 each)**
PR: CHM 442, EGB 343, EGR 471. Application of transport concepts to the solution of problems concerned with the design, economics and operation of chemical process equipment; fluid flow, heat transfer, absorption, drying, evaporation, crystallization, extraction, and distillation.

**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 481. SPECIAL TOPICS ENERGY CONVERSION I (1-4)**
PR: CC

**EGR 482. SPECIAL TOPICS ENERGY CONVERSION II (1-4)**
PR: CC
EGR 511. STATISTICAL THERMODYNAMICS (3)
PR: Cl. The statistical and microscopic approach to molecular transport phenomena. Boltzmann and quantum statistics; entropy and probability; the third law of thermodynamics; evaluation of partition functions.

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 515. HEAT TRANSFER II (4)

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, EGR 424. 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 the undergraduate course and devoted to a more detailed study of velocities, accelerations and forces in machine parts having reciprocating, rotating and combined motions. 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: EGR 343, 401. The theoretical basis of lubrication and hyrdrodynamic bearing theory. The study of lubrication requirements of different types of machines.

EGR 541. ANALOG COMPUTERS II (3)
PR: EGR 441. A continuation of EGR 441. Logical mode control, constrained mechanical systems, parameter identification techniques. (lec-lab).

EGR 553. PROCESS CONTROL (3)
PR: EGR 453 or Cl. Analysis and design of process control systems. Consideration of typical control sensors and controllers as well as advanced process control techniques such as feedback and ratio control.

EGR 554. HYDRAULIC CONTROL (3)
PR: EGR 453 or Cl. Hydraulic control system components and their effects on closed loop system performance. (lec-lab).

EGR 560. POWER UTILIZATION SYSTEMS (3)

EGR 576. REACTOR DYNAMICS (5)
PR: EGR 474. Lecture: (3 contact hours) Introduction to design and control of chemical reactors with particular emphasis on the roles of mixing and heat
transfer. Laboratory: (6 contact hours). The student in this laboratory will be responsible for the safe and efficient manufacture of a “chemical” in the planned Chemical Process Laboratory.

EGR 577. DESIGN AND CASE PROBLEMS (3)
PR: EGR 474. DESIGN: This part of the course exposes the chemical 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.

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 (3)
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. HEAT TRANSFER III (3)
PR: CC. Advanced treatment of basic heat transfer phenomena. Radiation through absorbing and non-absorbing media; radiation from gases and plasmas; “grey” body calculations. Analysis of convective heat transfer by boundary layer theory and equations of fluid motion.

EGR 617. ENERGY TRANFORMATION AND STORAGE (3)
PR: CC. Analysis of direct energy conversion systems; photovoltaic cells, thermocouples, fuel cells, thermionic converters, magneto-hydrodynamic devices, solar energy cells, rectifiers, inverters, energy storage devices.

EGR 621. INTRODUCTION TO NUCLEAR ENGINEERING II (3)

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, multizone systems, double duct and variable volume systems.

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 633. 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: EGB 333, 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 642. DIMENSIONAL ANALYSIS AND MODEL THEORY I (3)
PR: CC. Theory of dimensional analysis, similitude, and design of models.

EGR 643. DIMENSIONAL ANALYSIS AND MODEL THEORY II (3)
PR: EGR 642. Continuation of EGR 642. Including model testing and correlation of tests with fractional analysis.

EGR 648. DIRECT DIGITAL CONTROL (3)
PR: EGB 503, EGR 553, 656 or CI. Application of digital computers to control of engineering processes. Includes study of digital filtering, Z-transforms, supervisory control, A/D and D/A conversion.

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 656. 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 443, EGB 502, EGE 540 or CI. Application of state space techniques to analysis and design of energy transfer control systems. Includes study of optimal control and adaptive control.

EGR 681. SPECIAL PROBLEMS I (1-4)
PR: CC.

EGR 682. SPECIAL PROBLEMS II (1-4)
PR: CC.

EGR 698. ADVANCED SEMINAR (1-3)
PR: CC.

EGR 699. RESEARCH OR DESIGN (1-9)
PR: CC.

INDUSTRIAL SYSTEMS

EGS 401. INDUSTRIAL SYSTEMS (3)
Introduction to organizational, planning and control functions in industrial systems.

EGS 402. INDUSTRIAL PROCESSES (3)
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, 404. PRODUCTION DESIGN I, II (3 each)
PR: EGS 402, 461. 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 405, 406. PRODUCTION CONTROL SYSTEMS I, II (3 each)
PR: EGS 404, 441. Principles and techniques of industrial planning and control systems design. Cost analysis, forecasting and controlling production activities, including the use of CPM, PERT and LOB.

EGS 407. ENGINEERING VALUATION II (3)
PR: EGB 337 or equivalent. Analysis of economic limitations on engineering projects. Income tax considerations, replacement models, MAPI and obsolescence.

EGS 409. PLANT FACILITIES DESIGN I (4)
PR: EGS 405. Design and modification of plant facilities, including design of a
complete manufacturing operation. Problems in plant location, layout, material handling and equipment selection.

**EGS 421. HYBRID COMPUTERS** (3)
PR: EGB 232, EGS 325. The use of hybrid computers for the solution of problems in systems analysis. lec-lab.

**EGS 423. COMPUTER SYSTEMS I** (3)

**EGS 424. COMPUTER SYSTEMS II** (3)
PR: EGS 423. Introduction to computer hardware. Peripheral subsystems. Transfer of information and control within a complete operating system. Executive systems and control monitors.

**EGS 425. COMPUTER SYSTEMS III** (3)
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** (3)

**EGS 429. COMPUTER PROJECTS** (3)
PR: CC. Special projects involving the use of and operation of digital/analog computers.

**EGS 441, 442. OPERATIONS RESEARCH I, II** (3 each)
PR: EGS 461. An introduction to the basic operations research techniques—linear programming, dynamic programming, simulation and queueing.

**EGS 461, 462. ENGINEERING STATISTICS I, II** (3 each)
PR: MTH 303. An introduction to the basic concepts of statistical analysis. Probability, distribution functions, estimating and testing procedures, regression and correlation analysis.

**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 VALUATION STUDIES** (3)
PR: CC. The analysis of economic considerations affecting engineering decision making. Not open to students who have had EGS 407.

**EGS 521, 522. COMPUTER SIMULATION I, II** (3 each)
PR: CC. Use of digital, analog and hybrid computers in simulating physical and industrial systems.

**EGS 533. FORTRAN APPLICATIONS II** (3)
PR: EGS 333 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 442.

**EGS 541, 542. NUMERICAL METHODS OF SYSTEMS ENGINEERING I, II** (3 each)
PR: MTH 401. The study and application of matrix algebra, differential equations, calculus of finite differences, operation and transform methods, and stochastic processes.

**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 561, 562. DESIGN OF EXPERIMENTS I, II (3 each)
PR: EGS 462 or equivalent. Development of the basic experimental designs. Randomized block, latin squares and factorial designs.

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: EGS 461 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 609. PLANT FACILITIES DESIGN II (3)
PR: EGS 409 or CC. Advanced techniques for evaluation of alternative plans for plant arrangement, including equipment location and material handling systems.

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 each)
PR: EGS 662. 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 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.

**EGS 668. SPECIAL TOPICS IN STATISTICS (3)**

PR: CC. Special topics in statistics related to research in engineering.

**EGS 650, 651, 682. SPECIAL INDUSTRIAL TOPICS I, II, III (1-3 each)**

PR: CC.

**EGS 657, 658. INDUSTRIAL SYSTEMS DESIGN I, II (3 each)**

PR: EGS 521. Design of integrated systems using statistical and operations research models. Simulation of integrated systems using digital, analog and hybrid computers.

**EGS 698. ADVANCED ENGINEERING SEMINAR (1-3)**

PR: CC.

**EGS 699. RESEARCH OR DESIGN (1-12)**

**STRUCTURES, MATERIALS, FLUIDS**

**EGX 401. STRUCTURES I (5)**

PR: EGB 232, 340. Elastic-plastic behavior of structural members. Introduction to energy concepts in structural analysis; introduction to the theory of elasticity. (lec-lab)

**EGX 402. ENGINEERING MATERIALS II (4)**

PR: EGB 342, EGB 321. Thermodynamics of Solid Materials. Entropy and free energy concepts applied to equilibrium and rate processes in metallic, ceramic and polymer systems. Metallography. (lec-lab)

**EGX 409. SENIOR RESEARCH/DESIGN PROJECT I (1)**

PR: Completion of 150 hours. Presentation current and future problem-oriented research/design topics for engineers. Organization of student-faculty investigative teams for senior projects in EGX 509 or EGX 599.

**EGX 410. STRUCTURES II (4)**

PR: EGX 401. Introduction to the behavior of composite structural members: lamintes, 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 420. CONCEPTS OF MATERIALS ENGINEERING (3)**

PR: EGX 402. Application and selection of metals, ceramics, and polymers in engineering problems. Materials technology and failure analysis. (lec)

**EGX 421. PROCESSES IN MATERIALS ENGINEERING (3)**

PR: EGX 402 or CC. Introduction to the basic metal extraction and refining operations, discussion of the various techniques of elding and joining materials, and discussion of the primary methods of shaping and forming materials.

**EGX 481. TRANSPORTATION I (4)**

PR: EGB 203, CC. Introduction to Transportation Engineering. (lec)

**EGX 485. SOIL MECHANICS I (4)**

PR: EGB 341. Fundamental and experimental concepts in soil mechanics with emphasis on soil properties, soil moisture, soil structure and shearing strength. (lec)

**EGX 503. FLUID MECHANICS II (4)**


**EGX 504. EXPERIMENTAL SMF I (4)**

PR: EGB 343. An introduction to the experimental methods used in the study of structures, materials, fluids. (lec-lab)
EGX 505. SOLID MECHANICS III (3)
PR: EGB 341. Dynamics of discrete and distributed mass, spatial kinematics, and kinetics, inertia tensor, Euler equations. (lec)

EGX 509. SENIOR RESEARCH/DESIGN PROJECT II (3)
PR: EGX 409. Problem-solving experience and training for seniors in research/design projects. Oral and written final reports are required.

EGX 510. STRESSED-SURFACE STRUCTURES I (5)
PR: EGX 410 and 511 or 576. Elastic and inelastic behavior of plate and shell structures; smooth and ribbed surfaces. Use of finite element techniques. (lec-lab)

EGX 511. STRUCTURES III (5)
PR: EGX 401. Elastic and plastic analysis of determinate and indeterminate frames and trusses. Emphasis on matrix-computer techniques. (lec-lab)

EGX 513. PRESTRESSED STRUCTURES (5)

EGX 514. 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)

EGX 515. STRUCTURES IV (5)
PR: EGX 511. Analysis of suspension structures, towers and tall buildings by both approximate and exact methods. (lec-lab)

EGX 516. STRUCTURAL DESIGN IN METALS (3)

EGX 521. ENGINEERING POLYMERS (3)
PR: CC. Structure and bulk properties of polymers. High elasticity, topicsviscoelasticity, the glass transition, irreversible deformation. Technology of plastics, fibers and elastomers. (lec)

EGX 522. CORROSION (3)
PR: EGX 402 or CI. Corrosion principles and forms of corrosion. Testing, failure analysis and protection. Emphasis on application to engineering problems. Introduction to electro-chemical kinetics. (lec)

EGX 523. 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. (lec)

EGX 524. FRACTURE MECHANICS (3)
PR: CI. Introduction to mechanics of fracture. Design and testing for fracture toughness; microscopic plastic deformation, crack propagation, fatigue, ductile-brittle transition. (lec-lab)

EGX 525. STRENGTHENING PROCESSES IN MATERIALS (3)
PR: EGX 402. Introduction to the separate and combined effects of the primary strengthening mechanisms in materials. Application to the real material systems such as steels, titanium, beryllium, nickel and refractory metal alloys; and composites.

EGX 530. FLUID MECHANICS III (4)
PR: EGB 343. Mathematical hydrodynamics, inviscid flow. (lec-lab)

EGX 533. 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. (lec)

EGX 536. WATER RESOURCES ENGINEERING II (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 ac-
tivities with particular emphasis on water uses, engineering economy, and regional water resource development. (lec)

EGX 538. AERODYNAMICS (3)
PR: EGB 343. Fundamentals of compressible flow and flight dynamics. Structural Design; materials consideration. (lec)

EGX 540. EXPERIMENTAL SMF II (4)
PR: CC. Review of elasticity, boundary value problems, finite element solutions; static and dynamic applications, circuitry; grid, brittle coating methods. (lec-lab)

EGX 550. SOLID MECHANICS IV (3)
PR: EGB 341. Dynamics of Elastic Systems, Vibration of rods, plates, shells, structures; Energy and approximate solution techniques, transform techniques. (lec)

EGX 551. VIBRATIONS (3)
PR: EGX 505. Wave motion in solids and fluids, thermal and mechanical shock wave transmission and attenuation; blast loading. Phase-plane analysis. (lec)

EGX 570. INTRODUCTION TO CONTINUUM (3)
PR: CC. Development of techniques of applied mathematics to SMF problems; partial differential equations, complex variable, vector and tensor analysis. (lec)

EGX 571. CONTINUUM I (3)
PR: CC. Development of fundamental problems in solids and fluids from unified viewpoint; application to ideal media; elastic, plastic, viscoelastic, and fluids. (lec)

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. (lec)

EGX 573. MECHANICS OF COMPOSITE MATERIALS (3)
PR: EGX 401. Physical and Mathematical models for composites. Response to thermal, electrical and mechanical loading. Special compositesystems and shapes: filamentary plates, shells, isotensoid domes, etc.

EGX 575, 576. FINITÉ ELEMENT METHODS. (3)
PR: EGX 571 or CI. Finite element methods in continuum mechanics. Application to solid and fluid mechanics problems. Computer solutions. (lec)

EGX 580. SPECIAL TOPICS IN SMF (1-4)
PR: CC.

EGX 581. TRANSPORTATION II (4)
PR: EGX 481. Transportation system planning. (lec)

EGX 585. SOIL MECHANICS II (4)
PR: EGX 485. A study of the application of the principles of soil mechanics to problems in soils engineering. (lec)

EGX 598. RESEARCH IN SMF (1-4)
PR: CC.

EGX 599. RESEARCH IN SMF (1-4)
PR: CC.

EGX 610. STRESSED SURFACE STRUCTURES (5)
PR: EGX 401. Elastic and plastic behavior of plate and shell structures, smooth and ribbed surfaces. (lec-lab)

EGX 611. STRUCTURAL STABILITY I (5)
PR: EGX 511. Elastic and inelastic stability of trusses and frames, local buckling of structural members and plates.

EGX 612. STRUCTURAL DYNAMICS I (4)
PR: EGX 511. Behavior of structural components and systems when subjected to periodic dynamic loads. Introduction to random dynamic loads.

EGX 613. STRUCTURAL OPTIMIZATION (5)
PR: EGX 411, 511. Use of optimization techniques in the design of structures including use of the digital computer as a design aid. (lec-lab)
EGX 615. STRUCTURAL STABILITY II (4)

EGX 616. ADVANCED STRUCTURAL DESIGN (5)
PR: EGX 511, 514. A study of design of more complicated structural systems such as curved bridges, orthotropic bridges, tall buildings, towers, suspension structures.

EGX 617. STRUCTURAL DYNAMICS II (4)

EGX 618. STRESSED SURFACE STRUCTURES II (5)
PR: EGX 410, 610 and 615. Advanced analysis and design of smooth and ribbed shell structures made of both metallic and nonmetallic and composite materials. (lec-lab)

EGX 620. ENGINEERING MATERIALS IV (4)
PR: CC. Electronics processes in materials. Conductors and semi-conductors. Magnetic and Dielectric properties of solids, Quantum and statistical models. (lec-lab)

EGX 621. ENGINEERING MATERIALS V (4)

EGX 622. MICROMECHANICS (3)
PR: CC. The discrete and continuum concepts in crystalline, poly-crystalline and composite materials. Size effect and the continuum limit. (lec)

EGX 623. ADVANCED X-RAY METHODS (4)
PR: CI. X-Ray diffraction analytical and experimental studies of defects, texture, residual stress, crystal and polycrystalline aggregates. (lec-lab)

EGX 630. FLUID MECHANICS IV (4)
PR: CC. Flow of Newtonian and Non-Newtonian viscous fluids. (lec-lab)

EGX 631. GAS DYNAMICS (3)
PR: CI. Fundamentals of compressible flow. Wave and shock motion in unsteady and steady flow. Subsonic and supersonic speeds. (lec)

EGX 640. EXPERIMENTAL SMF III (4)
PR: EGX 504. Moiré and photoelastic experimental techniques. (lec-lab)

EGX 641. EXPERIMENTAL SMF IV (4)
PR: EGX 504. Theory and application of photoelasticity (lec-lab)

EGX 642. EXPERIMENTAL SMF V (4)
PR: EGX 504. Three dimensional stress analysis methods. (lec-lab)

EGX 643. EXPERIMENTAL SMF VI (4)
PR: EGX 504. Theory and application of holography and optical imagery. (lec-lab)

EGX 650. SOLID MECHANICS V (3)
PR: EGX 505. Elastic and plastic stress wave propagation in solids, experimental and theoretical treatment, method of characteristics. (lec)

EGX 651. NONLINEAR DYNAMICS (3)
PR: EGX 505. Non-linear restoring force, viscous friction, Duffing and Van der Pol’s equations, perturbation methods. (lec)

EGX 660, 661, 662. HYDROSPACE ENGINEERING I, II, III, (3 each)
PR: CC. Advanced analysis of structural, material and fluid systems for marine environment, including underwater acoustics. (lec)

EGX 670. CONTINUUM MECHANICS III (3)
PR: CC. Theory of Plasticity. Initial and subsequent yield surfaces, incremental and deformation theories, flow theories; problems in ideal plasticity, strain hardening and slip line fields. (lec)

EGX 671. CONTINUUM MECHANICS IV (3)
PR: CC. Theory of thermoelastic and viscoelastic behavior in continuous media. Basic laws of irreversible thermodynamics and elasticity and application to
one, two and three dimensional problems. Inelastic thermal stress. Viscoelastic-elastic analogy, linear viscoelastic theory and applications. (lec)

EGX 672. NUMERICAL METHODS IN ENGINEERING ANALYSIS (3)
PR: CI. Application of computational and mathematical techniques and principles to advanced engineering problems concerning structures, materials, fluids. (lec)

EGX 673. ADVANCED ELASTIC ANALYSIS (3)
PR: CI. Contemporary elasticity theory and applications. (lec)

EGX 674. APPLIED TENSOR ANALYSIS (3)
PR: CI. Tensor analysis applied to structures, materials, fluids. (lec)

EGX 675. WATER RESOURCE SYSTEMS (5)
PR: EGX 536. The planning, design, and operation of water resource systems by the use of systems analysis and operations research techniques. (lec)

EGX 680. SPECIAL TOPICS IN SMF (1-4)
PR: CC.

EGX 698. ADVANCED ENGINEERING SEMINAR (1-3)
PR: CC.

EGX 699. RESEARCH IN SMF (1-9)
PR: CC.

EGX 798. RESEARCH AND DISSERTATION (1-9)
PR: CC. Supervised independent research.

EGX 799. RESEARCH AND DISSERTATION (1-12)
PR: CC. Supervised independent research.

COMPUTER SERVICE COURSES

ESC 301. INTRODUCTION TO COMPUTERS I (3)
Basic principles of computer operation, program structure, machine and assembly language.

ESC 302. COMPUTER PROGRAMMING-FORTRAN (3)
PR: ESC 301. Programming of scientifically oriented problems using FORTRAN. Introduction to the use of the systems library.

ESC 303. COMPUTER PROGRAMMING-CÔBOL I (3)

ESC 304. COMPUTER PROGRAMMING—COBOL II (3)
PR: ESC 303. Advanced applications of COBOL. Development of matrix structures, subscripting and data manipulating techniques as used in comprehensive data processing problems.

ESC 310. INTRODUCTION TO COMPUTERS II (3)
PR: ESC 301. Component parts of a computer system. Internal representation and manipulation of data and program instructions. Algorithms and flowcharting. Programming languages and systems. (no credit for engineering majors)

ESC 311. INTRODUCTION TO COMPUTERS III (3)
PR: ESC 310. Continuation of the material in ESC 310. (No credit for engineering majors)

ESC 312. INTRODUCTION TO COMPUTERS IV (3)
PR: ESC 311. Continuation of the material in ESC 311. (no credit for engineering majors)

ESC 501. COMPUTER SYSTEMS (3)
PR: ESC 302 or equivalent. Study of computer systems components, I/O devices, memory devices, theory of computer operation. (Not available to students who have taken ESC 310, 311 and 312)

ESC 502, 503. COMPUTER LANGUAGES AND COMPUTATION I, II (3 each)

ESC 510. COMPUTER OPERATION (4)
PR: Graduate engineering or science status, EGB 232 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.

ENGINEERING TECHNOLOGY

ETK 421. PRINCIPLES OF INDUSTRIAL OPERATIONS I (3)
PR: ETK classification or CC. Techniques of work measurement and methods design.

ETK 422. PRINCIPLES OF INDUSTRIAL OPERATIONS II (3)
PR: ETK 421. Techniques of production control and job evaluation.

ETK 423. PRINCIPLES OF INDUSTRIAL OPERATIONS III (3)
PR: ETK 422. Techniques of plant location and layout.

ETK 601. SPECIAL TECHNICAL TOPICS I (1-4)
PR: CC.

ETK 602. SPECIAL TECHNICAL TOPICS II (1-4)
PR: CC.

ETK 603. SPECIAL TECHNICAL TOPICS III (1-4)
PR: CC.

ENGLISH


ENG 131. READING ACCELERATION (2)
Designed to change the reading habits and patterns of students. (Also see Developmental Reading.)

ENG 201. MAJOR BRITISH WRITERS TO 1660 (4)
PR: CBS 102. An introduction to the poetry, prose, and drama of English literature from its beginning through the Metaphysical poets.

ENG 202. MAJOR BRITISH WRITERS, 1666-1780 (4)
PR: CBS 102. English literature from Milton through the pre-Romantics.

ENG 203. MAJOR BRITISH WRITERS, 1780-1912 (4)
PR: CBS 102. English literature from the Romantics through the late Victorians.

ENG 301. CURRENT FICTION (3)
An examination of significant fiction written since 1960. Recommended for nonmajors; will not be counted toward the major.

ENG 302. CURRENT DRAMA (3)
An examination of significant drama written since 1950. Recommended for nonmajors; will not be counted toward the major.

ENG 305. MAJOR AMERICAN WRITERS TO 1865 (4)

ENG 306. MAJOR AMERICAN WRITERS, 1865-1912 (4)
PR: CBS 102. A study of the major realists and early naturalists. These include Whitman, Twain, James, Crane, Dickinson, Dreiser, and Robinson.

ENG 307. MODERN BRITISH AND AMERICAN WRITERS, 1912-1945 (4)
PR: CBS 102. Works by such American and British writers as Eliot, Pound, Yeats, Thomas, Shaw, Fitzgerald, Hemingway, Faulkner, Huxley, Woolf, Joyce, Lawrence, and others.

ENG 311. MASTERPIECES OF ENGLISH LITERATURE (5)
Examination of representative writers of English literature. Recommended for nonmajors; will not be counted toward the major.

ENG 312. MASTERPIECES OF AMERICAN LITERATURE (5)
Examination of representative writers of American literature. Recommended for nonmajors; will not be counted toward the major in Liberal Arts.
ENG 313. MASTERPIECES OF WORLD LITERATURE (5)
Examination of representative writers (exclusive of English and American) from the classical and medieval periods, the Renaissance and the Enlightenment, and the modern period. Will not be counted toward the major in Liberal Arts.

ENG 314. INTRODUCTION TO LITERATURE: GENERAL (4)
This course develops in the student the ability to read with understanding and interpret the genres of fiction, drama, and poetry. It is concerned with analysis rather than with historical periods. Recommended for nonmajors; will not be counted toward the major.

ENG 315. INTRODUCTION TO LITERATURE: FICTION (3)
An examination of the short story and the novel as a form. Recommended for nonmajors, it will not be tied to any historical period. Will not be counted toward the major.

ENG 316. INTRODUCTION TO LITERATURE: POETRY (3)
An examination of the poem as form. Recommended for nonmajors, it is not tied to any historical period. Will not be counted toward the major.

ENG 317. INTRODUCTION TO LITERATURE: DRAMA (3)
An introduction to drama as literature to be read rather than as literature to be performed. Recommended for nonmajors, it will not be tied to any historical period. Will not be counted toward the major.

ENG 319. THE BIBLE AS LITERATURE (4)
PR: CBS 102. Major emphasis on literary types, literary personalities of the Old and New Testaments, and Biblical archetypes of British and American literary classics.

ENG 321. NARRATION AND DESCRIPTION (4)

ENG 325. ADVANCED EXPOSITORY WRITING (4)
PR: CBS 102. Composition techniques in exposition, methods and styles of writing the article and the report.

ENG 335. WORLD LITERATURE (4)
PR: CBS 102. Masterpieces of the western world, in translation, including ancient, medieval, and Renaissance literature.

ENG 336. WORLD LITERATURE (4)
PR: CBS 102. Translated masterpieces of the Neoclassical, Romantic, Realistic and Naturalistic, Symbolist and Modern periods.

ENG 337. FOLKLORE AND POPULAR LITERATURE (4)
PR: CBS 102. Fairytales, folk tales, and ballads, from Sir Patric Spens to Bob Dylan and contemporary minstrel poets.

ENG 383. SELECTED TOPICS IN ENGLISH STUDIES (1-4)
PR: Sophomore standing. This course will examine in depth a recurring literary theme of the work of a small group of writers. Special courses in writing may also be offered under this title.

ENG 411. PLAYS OF SHAKESPEARE (4)
PR: ENG 201 and 12 hours of literature. A study of ten representative plays by Shakespeare.

ENG 415. BLACK FICTION. (4)
Studies in the development of Black Fiction. Writers to be studied include Wright, Baldwin, Ellison, and others.

ENG 416. BLACK POETRY AND DRAMA. (4)
Examination of representative black poets and dramatists, including Hughes, Jones, Cullen, Brooks; Hansberry, Davis, Baldwin, and Jones.

ENG 421. IMAGINATIVE WRITING—POETRY (4)
Studies and exercises in prosody and imagery; written assignments in traditional and contemporary forms; evaluation of student work in individual conferences; selected reading. May be taken twice for credit. When the course is offered twice in the same academic year, the second offering is open only to students who took the course in the previous quarter.

ENG 423. IMAGINATIVE WRITING—FICTION (4)
PR: ENG 321. Study and writing of the short story and sections of the novel. Evalu-
tion of student work in conferences, selected readings. May be taken twice for credit. When the course is offered twice in the same academic year, the second offering is open only to students who took the course in the previous quarter.

ENG 425. THE AMERICAN NOVEL (4)
PR: 16 hours of literature. Selections from the novels of Charles Brockden Brown, Cooper, Hawthorne, Melville, Twain, Stephen Crane, Frank Norris, Edith Wharton, Henry James, and Theodore Dreiser.

ENG 426. THE AMERICAN DRAMA (4)
PR: 16 hours of literature. American dramatic literature from the beginnings to the present.

ENG 429. EIGHTEENTH-CENTURY BRITISH NOVEL (4)
PR: 16 hours of literature. The historical development of the British novel; precursors of the novel; Richardson, Fielding, Smollett, Sterne, and the Gothic novelists.

ENG 430. NINETEENTH-CENTURY BRITISH NOVEL (4)
PR: 16 hours of literature. A continuation of the development of the British novel; Austen, Scott, Thackeray, Dickens, Trollope, the Brontes, Eliot, Meredith, Hardy, and Butler.

ENG 437. CONTINENTAL NOVEL (4)
PR: 12 hours of literature. Major European novels from the Eighteenth Century to the present. Emphasis upon French and Russian novels of the Nineteenth Century.

ENG 459. DRAMA AND THE MODERN LITERARY TEMPER (4)
PR: 12 hours of literature. A study of the major literary problems faced by modern dramatists since Ibsen and the rise of realism.

ENG 481. INDIVIDUAL RESEARCH (1-5)
PR: 12 hours of literature. Directed study in special projects. Special permission of chairman required.

ENG 483. SELECTED TOPICS IN ENGLISH STUDIES (1-4)
PR: Sophomore standing. The content of the course will be governed by student demand and instructor interest. It will examine in depth a recurring literary theme or the work of a small group of writers. Special courses in writing may also be offered under this title.

ENG 500. OLD ENGLISH LITERATURE (4)
PR: 20 hours of literature. Old English literature (to 1100) in modern translation.

ENG 501. CHAUCER (4)
PR: 20 hours of literature. An introduction to the language through the “Prologue” to The Canterbury Tales. Study of the Book of the Duchess, a selected number of Tales, the House of Fame, and Troilus and Criseyde.

ENG 502. THE LITERATURE OF MEDIEVAL ENGLAND (4)
PR: 20 hours of literature. An examination of the historical and social backgrounds of medieval literature and representative works of the period.

ENG 503. ENGLISH DRAMA FROM THE BEGINNINGS THROUGH MARLOWE (4)
PR: 20 hours of literature. Readings in representative tropes, cycle plays, morality plays, interludes and school plays; and in early Elizabethan dramatists: Lyly, Peele, Greene, Kyd, with an emphasis on Marlowe.

ENG 504. ENGLISH DRAMA FROM BEN JONSON TO 1642 (4)
PR: 20 hours of literature. Chapman, Marston, Dekker, Middleton, Tourneur, Beaumont and Fletcher, Shirley; with emphasis upon Jonson, Webster, and Ford.

ENG 505. SEVENTEENTH-CENTURY POETRY (4)
PR: 20 hours of literature. Emphasis upon leading Metaphysical and Cavalier poets: Donne, Herbert, Jonson, Herrick, Marvell, and others.

ENG 506. SIXTEENTH-CENTURY ENGLISH POETRY (4)
PR: 20 hours of literature. Raleigh, Sidney, Spenser, Shakespeare and others.
ENG 507. MILTON (4)  
PR: 20 hours of literature. An examination of Paradise Lost, Paradise Regained, Comus, the shorter poems, and selected prose works.

ENG 508. ENGLISH RENAISSANCE PROSE (4)  
PR: 20 hours of literature. English fiction and nonfiction 1500-1660; Lyly, Sidney, Nashe, Bacon, Donne, Browne, Hobbes, Milton.

ENG 511. RELIGIOUS AND EXISTENTIAL THEMES IN MODERN LITERATURE (4)  
Theological and philosophical ideas, allusions, and symbols in the writings of Dostoevski, Nietzsche, Mann, Joyce, Eliot, Camus, Sartre, and others.

ENG 513. THE ROMANTIC WRITERS (4)  
PR: 20 hours of literature. The poetry and poetics of Blake, Wordsworth, Coleridge, Byron, Shelley, Keats; with attention to lesser figures.

ENG 515. HISTORY OF THE ENGLISH LANGUAGE (4)  
PR: 24 hours of literature. The evolution of the language from Anglo-Saxon through Middle English to Modern English. Changes in pronunciation and syntax; discussion of the forces which influenced them.

ENG 517. STRUCTURE OF AMERICAN ENGLISH (4)  
PR: 20 hours of literature. The phonology, morphology, and syntax of American English. Structural grammar; the application of linguistics to the teaching of English.

ENG 518. LINGUISTICS AND LITERATURE (4)  
PR: ENG 517, ENG 535, or LIN 501. The analysis and interpretation of British and American literature, poetry, prose, and drama, using relevant materials from the field of descriptive and comparative linguistics.

ENG 519. SHAKESPEARE’S COMEDIES AND HISTORIES (4)  
PR: ENG 411. An intensive study of Shakespeare’s major comedies and histories.

ENG 520. SHAKESPEARE’S TRAGEDIES (4)  
PR: ENG 411. An intensive study of Shakespeare’s major tragedies.

ENG 521. RESTORATION AND 18TH CENTURY LITERATURE (4)  
(exclusive of the drama and novel)  
PR: 20 hours of literature. Concentration upon selected figures of the period: Dryden, Pope, Swift, Johnson and others.

ENG 523. NINETEENTH-CENTURY BRITISH LITERATURE (4)  
Essays of Carlyle, Newman, Mill, Ruskin, Arnold, Pater; poetry of Tennyson, Browning, Swinburne; novels of Dickens, Meredith; plays of Wilde, Shaw.

ENG 527. MODERN BRITISH AND AMERICAN POETRY (4)  
PR: 20 hours of literature. Selected poets from Hopkins to the present, with attention to modern poetic theory.

ENG 528. CONTEMPORARY BRITISH & AMERICAN FICTION (4)  
A critical study of British and American fiction since World War II. Works by Mailer, Beckett, Bellow, Ellison, Nabokov, and others.

ENG 531. LITERARY CRITICISM (4)  
PR: 24 hours of literature. Emphasis on either the great critics and the principles of criticism or on applied criticism of fiction, poetry and drama.

ENG 535. TRANSFORMATIONAL GRAMMAR (4)  
PR: 90 hours or CI. An introduction to the basic concepts of generative-transformational grammar with emphasis upon its implications for teachers of English.

ENG 559. RESTORATION-EIGHTEENTH-CENTURY DRAMA (4)  
PR: 20 hours of literature. Dryden, Congreve, Sheridan, Goldsmith, and others.

ENG 581. INDIVIDUAL RESEARCH (1-5)  
PR: 20 hours of literature. Directed study in special projects. Special permission of chairman required.

ENG 583. SELECTED TOPICS IN ENGLISH STUDIES (1-4)  
PR: 20 hours of literature. The content of the course will be governed by student demand and instructor interest. It will examine in depth a recurring literary theme or the work of a small group of writers.

ENG 585. DIRECTED READING (4)  
Readings in special topics.
FOR GRADUATE STUDENTS ONLY

ENG 601. PROBLEMS IN COLLEGE ENGLISH INSTRUCTION:
COMPOSITION (3)
PR: Graduate standing. An examination of the objectives of freshman English and an investigation of current techniques for achieving those objectives, emphasizing the problems of developing critical reading and the techniques of expository writing at the college level.

ENG 616. STUDIES IN MIDDLE ENGLISH (4-16)
PR: 24 hours of literature in English. Selected focused studies in language and in various authors and writings 1100-1500: Chaucer, the Pearl poet, Everyman, ballads, drama. May be retaken with different subject matter three times.

ENG 620. STUDIES IN SIXTEENTH-CENTURY BRITISH LITERATURE (4-16)
PR: 24 hours of literature in English. Selected focused studies in 16th Century British literature: Shakespeare, Sidney, Spenser, Marlowe, and others. May be retaken with different subject matter three times.

ENG 625. STUDIES IN SEVENTEENTH-CENTURY BRITISH LITERATURE (4-16)
PR: 24 hours of literature in English. Selected focused studies in British literature 1600-1660: Bacon, Donne, Jonson, Herbert, Milton, and others. May be retaken with different subject matter three times.

ENG 627. BRITISH RENAISSANCE PROSE (4)
PR: 24 hours of literature in English. A study of the thematic, generic, and rhetorical development of prose in England from 1500 to 1660: Lyly, Greene, Bacon, Donne, Browne, Hobbes, Milton, and others. May not be taken in addition to ENG 657.

ENG 630. STUDIES IN RESTORATION AND EIGHTEENTH-CENTURY BRITISH LITERATURE (4-16)
PR: 24 hours of literature in English. Selected focused studies in Restoration-Eighteenth-Century British literature: Dryden, Defoe, Pope, Swift, Fielding, Sheridan, Johnson, Boswell, and others. May be retaken with different subject matter three times.

ENG 640. STUDIES IN NINETEENTH-CENTURY BRITISH LITERATURE (4-16)
PR: 24 hours of literature in English. Selected focused studies in British Romantic and Victorian literature. May be retaken with different subject matter three times.

ENG 646. STUDIES IN NINETEENTH-CENTURY BRITISH NOVEL (4)
PR: 24 hours of literature in English. Dickens, Thackeray, Eliot, and others. May not be taken in addition to ENG 667.

ENG 650. STUDIES IN AMERICAN LITERATURE TO 1860-1920 (4-16)
PR: 24 hours of literature in English. Selected focused studies in American literature before 1860: the Puritans, Franklin, Cooper, Irving, Poe, Emerson, Hawthorne, Melville, and others. May be retaken with different subject matter three times.

ENG 660. STUDIES IN AMERICAN LITERATURE 1860-1920 (4-16)
PR: 24 hours of literature in English. Selected focused studies in American literature: Whitman, Twain, Howells, James, Crane, Dreiser, and others. May be retaken with different subject matter three times.

ENG 665. STUDIES IN LATE NINETEENTH-CENTURY AMERICAN FICTION (4)
PR: 24 hours of literature in English. Twain, James, Crane, and others. May not be taken in addition to ENG 687.

ENG 670. STUDIES IN TWENTIETH-CENTURY LITERATURE (4-16)
PR: 24 hours of literature in English. Selected focused studies of literature in our century: Joyce, Hemingway, Eliot, Faulkner, and others. May be retaken with different subject matter three times.

ENG 681. GRADUATE RESEARCH (1-5)
PR: CI and 24 hours of literature in English. Directed study in special projects. Special permission of chairman required.
ENG 683. SELECTED TOPICS IN ENGLISH STUDIES (1-8)
PR: 24 hours of literature in English. Current topics offered on a rotating basis include The Nature of Tragedy; The Nature of Comedy and Satire; The Nature of Romanticism and Classicism; and The Nature of Myth, Allegory, and Symbolism. Other topics will be added in accordance with student demand and instructor interest.

ENG 690. SCHOLARSHIP AND CRITICISM (4-8)
PR: 24 hours of literature in English. Selected focused study of research approaches to English. May be retaken with different subject matter once.

ENG 691. GRADUATE SEMINAR IN ENGLISH (4)
PR: Consent of graduate advisor.

ENG 693. METHODS OF RESEARCH (4)
PR: 24 hours of literature in English. Introduction of aims and methods of literary scholarship. Detailed studies of bibliographies of cultural milieus, genres, periods, and authors. May not be taken in addition to ENG 623.

ENVIRONMENT

ENV 301. DIALOGUE IN ENVIRONMENTAL SURVIVAL (4)
A multidisciplinary course dealing with environmental problems. (Pass/Fail)

FINANCE

Faculty: Longstreet, Chairman; Brunhild, Deaux, Deiter, D. A. Johnson, Kares, Landry, Meyer, Modrow, Power, Rappold, C. T. Smith.

FIN 201. PERSONAL FINANCE (5)
Survey of the problems and techniques of family financial planning. Includes consumer credit, insurance, home ownership and personal investing, with attention given to current economic and legal constraints. Not available for credit to upper level students who have been admitted to the College of Business.

FIN 202. PERSONAL INVESTMENTS (4)
PR: FIN 201. Designed for non-business administration students who have not taken accounting or corporation finance, it emphasizes the operations of the security markets in the U.S. and the risks and returns of alternative investment media. Not available for credit to upper level students who have been admitted to the College of Business.

FIN 301. PRINCIPLES OF FINANCE (5)
PR: ACC 305, and ECN 201. Fundamental tools and techniques applicable to financial planning of incorporated and unincorporated business, emphasizing the problems of acquisition, supervision, and allocation of resources.

FIN 303. PRINCIPLES OF INSURANCE (5)
Analysis of insurable risks of both businesses and individuals. An examination of the characteristics of those areas of risk and uncertainty where the mechanisms of insurance are effective alternatives. The concept, contracts and institutions involved in insurance are examined in relationship to the socio-economic environment.

FIN 305. PRINCIPLES OF REAL ESTATE (5)
Economics of urban land utilization and the nature of property rights. Problems of urban development and the valuation of real property in terms of the structure and operations of the real estate market.

FIN 321. MONEY AND BANKING (4)
PR: ECN 202. Examines the structure and operations of our monetary system, commercial banking, central banking, money and capital markets, and provides an introduction to monetary theory and policy.
FIN 351. INTERNATIONAL FINANCE (5)
PR: ECN 202 or CI. Principles of the acquisition, supervision and allocation of funds for multi-national firms.

FIN 411. ADVANCED CORPORATION FINANCE (4)
PR: FIN 301. An examination of the financial policies of publicly-owned corporations, with special reference to dividend policy, financial structure, capital expenditures, acquisitions, mergers and reorganization.

FIN 421. PRINCIPLES OF INVESTMENT (4)
PR: FIN 301 and ECN 202. Survey of the risks and returns of investment media in relation to the investment objective of individual and institutional investors. Includes an examination of the capital markets, information flows and analytical techniques in terms of their impact upon the valuation process.

FIN 431. FINANCIAL INSTITUTIONS (4)
PR: FIN 321. A study of financial intermediaries and the capital markets and their interaction in the capital formation process.

FIN 451. FEDERAL RESERVE SYSTEM AND MONETARY POLICY (4)
PR: ECN 323 or FIN 321. An analysis of the structure of the Federal Reserve System and monetary policy within the framework of monetary theories.

FIN 461. FINANCIAL POLICIES AND STRATEGIES (3)
PR: FIN 411. Senior seminar for majors in finance. Quantitative and qualitative analysis of financial policies based on independent readings and empirical research.

FIN 471. PORTFOLIO MANAGEMENT (3)
PR: FIN 421. Study of advanced investment methods with special emphasis on quantitative, timing, and diversification techniques of individual and institutional investors.

FIN 489. SPECIAL STUDIES IN FINANCE (1-5)
PR: CI. Independent study program under the guidance of departmental staff. Includes an examination of professional literature and empirical research.

FOR SENIOR LEVEL AND GRADUATE STUDENTS ONLY

FIN 501. BUSINESS FINANCE (3)
PR: ACC 501 and ECN 501 or its equivalent. Accelerated introduction to fundamentals of business finance. Emphasis is placed on the formal presentation of financial models for decision making. The institutional features of the financial environment are also covered.

FOR GRADUATE STUDENTS ONLY

FIN 601. FINANCIAL MANAGEMENT (3)
PR: ECN 503, FIN 501 or their equivalent. An examination of financial practice at the level of the individual firm with emphasis on quantitative analysis of the variables affecting solvency and profitability.

FIN 602. CAPITAL MARKETS (3)
PR: ECN 501 and 502 or their equivalent. An investigation of the capital markets and their relationship to the external financing of firms.

FIN 621. INVESTMENTS (3)
PR: FIN 501 or equivalent, CI. An examination of the risks and returns of alternative investment media within the framework of various valuation models. Special attention is given to the investment process and the criteria for investment decisions.

FINE ARTS (Intradivisional)

Faculty: Hug, G. Johnson, Kase, McCracken, O'Sullivan, Strawn.

FNA 443. FINE ARTS FORUM (1)
PR: CC. To aid Fine Arts students in understanding and appraising the various
arts through systematic attendance at performances and other aesthetically significant events. Critical evaluation sessions will be held.

**FNA 453. FINE ARTS SEMINAR FOR OFF-CAMPUS TERM (1-9)**  
PR: CC. CR: FNA 543. To facilitate an intensive study of the fine arts through primary experiences with creative activities which are uniquely available in major artistic centers.

**FNA 543. COMPARATIVE ARTS/ISSUES IN CREATIVITY (3)**  
PR: Two history courses, theory or literature courses in major area or CC. An analysis of various theories of art and the intellectual implication of differing propositions about aesthetics.

**FNA 553. FINE ARTS SENIOR SEMINAR (3)**  
PR: FNA 543 or CC. To aid majors to understand, appraise and perfect their own art and technique through critical and aesthetic judgements of their colleagues. Discussion and critical evaluation.  
Section 001 is reserved for Music and Music Education students.  
Section 002 is reserved for Theatre Arts students.  
Section 003 is reserved for Visual Arts and Art Education students.  
Section 004 is reserved for Dance students.

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**FRENCH**

**SEE MODERN LANGUAGES**

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**GENERAL BUSINESS ADMINISTRATION**

*Faculty:* Allen, Birkin, Grant, Kahn, C. Kayser, Knipper, Richardson, Rogier, Steinike, Van Voorhis, Walsh, Welker.

**GBA 333. COMPUTERS IN BUSINESS I (3)**  
An introductory interdisciplinary examination of basic computer applications in business organizations. Problems are reduced to schematic logic, then focus is placed on decision making through computer output. Computer hardware and software systems will be introduced.

**GBA 351. COMPUTERS IN BUSINESS II (5)**  
PR: GBA 333. An advanced interdisciplinary examination of the computer's impact on the business enterprise. Concepts of data collection and information theory are developed. In addition, model manipulation techniques are introduced in the areas of extremum finding and search.

**GBA 361. BUSINESS LAW I (5)**  
The nature of legal institutions, essentials of a binding contract, remedies granted in event of breach of contract and rights acquired by assignment of contracts.

**GBA 362. BUSINESS LAW II (5)**  
PR: GBA 361. Legal problems in marketing of goods, nature of property, sales of personal property, securing of credit granted, nature and use of negotiable instruments.

**GBA 363. THE LAW OF BUSINESS ASSOCIATIONS (5)**  
PR: GBA 361. A study of the law of corporations, the law of partnerships, and the law of agency.

**GBA 371. BUSINESS COMMUNICATIONS (4)**  
Analysis and application of the principles of persuasion in business communication; composition and evaluation of functional business letters; examination of effective text, tabular and graphic presentation in formal business reports.

**GBA 489. INDIVIDUAL RESEARCH (1-2)**  
Individual research in the students major area supervised by an appropriate faculty member.
GEOGRAPHY

GBA 499. SENIOR SEMINAR IN ADMINISTRATION (3)
PR: Graduating senior and minimum GPR of 2.5. The course is intended to provide a unifying, integrating, and coordinating opportunity to tie together concepts, principles, and skills learned separately in other, more specialized courses in Business Administration.

GBA 501. CBS WORKSHOP (1-6)
Professional applications workshop in various areas of finance, marketing, economics, accounting, management. May be repeated when subjects differ. Not applicable to degree programs in College of Business Administration.

FOR GRADUATE STUDENTS ONLY

GBA 601. LEGAL ENVIRONMENT OF BUSINESS (3)
A study of the governmental regulation of business emphasizing the constitutional limitations on the powers of the federal government, the administration of the federal antitrust laws, and administrative law.

GBA 603. QUANTITATIVE METHODS I (3)
PR: MTH 211, or equivalent. Mathematical techniques for administrative problems, including linear programming, game theory, and optimization models and procedures using calculus and matrix algebra.

GBA 605. QUANTITATIVE METHODS II (3)
PR: MTH 211, ECN 431, or equivalents. Probability and sampling, Bayesian decision theory, and the design of experiments, as applied to administrative problems.

GBA 615. INTEGRATIVE SEMINAR (3)
PR: CI. The integration of analysis and policy for the decision-making process in administration. This course should be taken at the end of a student’s program.

GBA 699. THESIS (6)

GEOGRAPHY

Faculty: Fuson, chairman; Limoges, Palmer, Rothwell, Schaleman, Stafford, Stowers.

GPY 301. SYSTEMATIC GEOGRAPHY (5)
Principles and concepts of the discipline; maps, earth-sun relations, weather, climate.

GPY 302. SYSTEMATIC GEOGRAPHY (5)
PR: GPY 301. Landforms and conservation of resources. Latter part of course deals with man's use of the natural environment.

GPY 303. HUMAN GEOGRAPHY (5)
PR: GPY 301-302. Systematic treatment of man's activities on earth: population, settlement, agriculture, industry, trade, transportation, and political aspects are among those considered.

GPY 371. GENERAL GEOGRAPHY (5)
Varied topics in regional and topical geography. May be repeated as topics vary, but the same topic may not be repeated for credit. Open to anyone in the University.

GPY 403. PHYSICAL GEOGRAPHY (5)
PR: 301-302. Courses include: meteorology, climatology, physiography, biogeography, soils, water bodies. May be repeated as courses vary, but the same course may not be repeated for credit.

GPY 405. CULTURAL GEOGRAPHY (5)
PR: GPY 301-302-303. Courses include: economic, political, urban, historical geography; population, settlement, conservation. May be repeated as courses vary, but the same course may not be repeated for credit.

GPY 407. REGIONAL GEOGRAPHY (5)
PR: GPY 301-302. Synthesis and analysis of the physical and cultural elements in a selected geographic region. May be repeated as regions vary, but the same regions may not be repeated for credit.

GPY 409. GEOGRAPHIC TECHNIQUES AND METHODOLOGY (5)
PR: 301-302-303. Courses include: cartography, graphics, map design and analy-
sis, air photo interpretation, field methods, quantitative analysis, seminar. May be repeated as courses vary, but the same course may not be repeated for credit.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

GPY 501. GEOGRAPHIC LITERATURE AND HISTORY (4)
PR: Senior or graduate standing in geography, or CI. The origins and development of the discipline as revealed through an examination of the principal written sources. Special attention paid to leading personalities and modern periodicals.

GPY 503. METHODOLOGY I: QUANTITATIVE (4)
PR: Senior or graduate standing in geography, and a course in statistics, or CI. The application of quantitative techniques to geographic problems; factor, sensitivity, and spatial analysis.

GPY 505. METHODOLOGY II: CARTOGRAPHIC (4)
PR: Senior or graduate standing in geography, GPY 409 (Cartography), or CI. Application of various techniques for presenting graphic illustrations as research tools.

GPY 507. METHODOLOGY III: FIELD WORK (4)
PR: Senior or graduate standing in geography, GPY 503 or 505. Data collection in a field situation, including observation, classification, interpretation, and presentation of the data.

GPY 581. INDIVIDUAL RESEARCH (1-5)
PR: 30 hours in geography and CI, or graduate standing in geography. Arrangement must be made with chairman prior to registration. May be repeated.

GPY 585. DIRECTED READING (1-5)
PR: 30 hours in geography and CI, or graduate standing in geography. Arrangement must be made with chairman prior to registration. May be repeated.

FOR GRADUATE STUDENTS ONLY

GPY 601. METHODOLOGY IV: ACADEMIC (4)
PR: Graduate standing in geography. Current trends in college geography, with the emphasis on the junior college program. Not available to thesis students.

GPY 603. SEMINAR IN ADVANCED PHYSICAL GEOGRAPHY (4)
PR: Graduate standing in geography. Analytic study of a problem selected from one or more aspects of the atmosphere, biosphere, hydrosphere, or lithosphere. May be repeated once for credit, but topic may not be repeated.

GPY 605. SEMINAR IN ADVANCED CULTURAL GEOGRAPHY (4)
PR: Graduate standing in geography. Analytic study of a problem selected from one or more aspects of the cultural landscape (urban, political, economic, population, settlement). May be repeated once for credit.

GPY 607. SEMINAR IN ADVANCED REGIONAL GEOGRAPHY (4)
PR: Graduate standing in geography. Analytic study of a selected region of the world. May be repeated once for credit, but region may not be repeated.

GPY 609. SEMINAR IN ADVANCED TECHNIQUES & METHODOLOGY (4)
PR: Graduate standing in geography. Analytic study of a selected geographic technique (such as remote sensing, graphics, photo interpretation, or computer applications) or an investigation into an aspect of methodology. May be repeated once for credit, but topic may not be repeated.

GPY 689. DIRECTED TEACHING (1-9)
GPY 699. THESIS (1-9)

GEOLOGY

Faculty: Ragan, chairman; Boulware, Huang, Keller, O'Donnell, Spangler, R. G. Stevenson

GLY 201. INTRODUCTION TO GEOLOGY (5)
Study of earth materials and the processes responsible for changing the face of the
earth. Examination of minerals and rock specimens, topographic and geologic maps and aerial photographs. Occasional field trip studies. Required lec-lab.

GLY 301. INTRODUCTION TO HISTROICAL GEOLOGY (4)
Study of the record of past life and interpretation of the major physical events in the history of the earth. Occasional field trip studies. lec-lab.

GLY 302. INTRODUCTION TO PALEONTOLOGY I (4)
PR: GLY 301 or CI. Paleontology and stratigraphic occurrence of most important invertebrate fossils of the geologic record. lec-lab.

GLY 303. INTRODUCTION TO PALEONTOLOGY II (4)
The second half of GLY 302.

GLY 311. MINERALOGY (4)
PR: GLY 201 and General Chemistry, or equivalent; or CI. Origin, occurrence, and chemistry of mineral groups. Identification of common minerals by physical and chemical properties. lec-lab.

GLY 351. INTRODUCTION TO HYDROGEOLOGY (5)
PR: GLY 201, 301 and CC. Occurrence, circulation, and distribution of subsurface water, its chemical and physical properties, relation to the geologic environment, exploration and development. lec-field-lab.

GLY 361. STRUCTURAL GEOLOGY (5)
PR: GLY 201 or equivalent. Application of basic principles of geology, mathematics, and physics in solving relationships of strata and interpreting structural features in the earth’s crust. lec-lab.

GLY 371. GEOLOGY OF OUR NATION’S PARKS (4)
Representative parks used to illustrate current concepts in Geology of general interest. Designed for the student not majoring in science. (May not be counted for credit toward a Geology or divisional major in Geology).

GLY 401. FIELD AND SUBSURFACE METHODS (5)
PR: 24 hours of geology courses, CC. Fundamentals of geology in the field and marine laboratory; compass and plane table mapping, mapping of aerial photos, reconnaissance surveys, interpretation of geologic structures. lec-lab.

GLY 411. MARINE GEOLOGY (4)

GLY 412. OPTICAL MINERALOGY (4)
PR: GLY 311 (Non-majors from other departments, CC). Theory and use of the polarizing microscope. Techniques for identification and analysis of minerals using the polarizing microscope, with emphasis on rock-forming minerals. lec-lab.

GLY 441. ECONOMIC MINERAL DEPOSITS (4)
PR: or CR: GLY 412. Principles involved in the origin, occurrence, recovery, and use of mineral resources. lec-lab.

GLY 471. GEOLOGY OF SOILS (5)
PR: General Chemistry or equivalent. The origin, geologic development, formation, and nature of soils. Fundamentals of soil science, including the physical, chemical, and biological factors affecting soil fertility with special application to the soils and ecology of Florida. lec-lab.

GLY 473. CONCEPTS IN EARTH SCIENCE (5)
Earth’s environment in space, including a selected study of its materials, processes, climate, oceans, soils and history, lec-disc.

(No credit for geology or natural science divisional geology majors)

GLY 475. HYDROGEOLOGY AND HUMAN AFFAIRS (5)
PR: Open to all junior and senior level students. Geologic analyses of the present critical and urgent problems of water resources, pollution control, water supply, flood control, and underground waste disposal as they relate to economic, legal and other social aspects of modern society. No credit for Geology majors.

GLY 481. UNDERGRADUATE RESEARCH (1-6)
PR: Senior or advanced junior standing and permission of department chairman prior to registration. Individual experimental investigations with faculty supervision. (S/U grade only.)
FOR SENIOR LEVEL AND GRADUATE STUDENTS

GLY 503. SEDIMENTATION I (4)
PR: GLY 303 and 412. Geologic factors governing chemical, physical, and biological interactions and deposition of sediments. lec-lab.

GLY 504. SEDIMENTATION II (4)
The second half of GLY 503.

GLY 512. MARINE GEOLOGY (4)
PR: Senior or graduate standing in a natural science and CC. Geological interpretation of marine processes and products. Seminar and field studies. lec-lab.

GLY 513. PETROGRAPHY (5)
PR: GLY 311 and 412. Systematic study of igneous and metamorphic complexes using modern methods of rock study, emphasizing use of the polarizing petrographic microscope for thin-section analysis. lec-lab.

GLY 521. PRINCIPLES OF APPLIED GEOPHYSICS (4)
PR: Senior or advanced Junior standing, one year of Physics, or CI. Elementary treatment of gravimetric, magnetic, electric and seismic geophysical techniques as applied to site investigations and mineral deposits. lec-lab.

GLY 531. PRINCIPLES OF STRATIGRAPHY (4)
PR: GLY 361 or CI. Environmental and paleogeographic reconstruction of sedimentary basins. Seminar. lec-lab.

GLY 532. ADVANCED STRATIGRAPHY (5)
PR: GLY 531 or CI. Study of the stratigraphy and paleotectonic development of North America and Europe.

GLY 533. GEOMORPHOLOGY (4)
PR: Senior or advanced junior standing and CC. Origin, evolution, and distribution of land forms.

GLY 534. QUANTITATIVE GEOMORPHOLOGY (4)
PR: GLY 533 or CI. Quantitative methods and their application to geomorphic problems; review and concepts of recent theories and literature. lec-lab.

GLY 541. GEOPHOTO INTERPRETATION (5)
PR: Senior standing, GPY 409 and/or CI. Geo-analysis of air photos and earth data, including some acquired by remote sensing techniques. Analysis of chemical and physical sample data, lec-lab.

GLY 553. ADVANCED HYDROGEOLOGY (5)
PR: GLY 351, MTH 213 or 303, PHY 215-216, or CI. Aquifer evaluation and quantitative determination of the hydraulic characteristics of hydrogeologic systems. lec-field-lab.

GLY 561. X-RAY ANALYSIS (2)
PR: GLY 412 or CI. (Non-majors from other areas, CI.) The use of X-rays for the identification of crystalline materials.

GLY 571. GEOCHEMISTRY I (4)
PR: CHM 211, 212, 213 or equivalent. Origin and chemistry of the earth. Age, formation, heat balance, and evolution of the earth and the solar system. Application of basic chemical concepts and processes that govern the distribution of the elements in geologic environments.

GLY 572. GEOCHEMISTRY II: Low Temperature Solution Geochemistry (5)
PR: CHM 213, GLY 513, or CI. Application of the fundamentals of solution chemistry and equilibrium of aqueous species in multi-component systems to the natural environments such as ores, weathering, diagenesis, rivers, lakes, ocean and other aqueous environments.

GLY 573. GEOCHEMISTRY III: Analytical Geochemistry (4)
PR: CHM 213, GLY 513, or CI. Experimental techniques by chemical and modern methods to determine major and trace elements in minerals, rocks, meteorites, and natural water; statistical and mathematical modeling to the solution of geochemical problems also discussed.

GLY 575. GEOTECHNICS (4)
PR: Senior or advanced Junior standing or CI. Concept of soil and rock mechanics, and their relationship to geological conditions influencing the location, design, construction and maintenance of engineering projects, lec-field-lab.
GLY 583. SELECTED TOPICS IN GEOLOGY (1-6)
PR: Senior or advanced junior standing and CC. Each topic is a course in directed study under supervision of a faculty member. Courses include: Introductory Geological Oceanography, Advanced Stratigraphic Paleontology, Palynology, Sedimentary Processes, Sedimentary Techniques, Universal Stage, Seismology, Marine Geophysics, Exploration Geophysics, Ground Water Problems and others. Department permission prior to registration.

GLY 591. GEOLOGY SEMINAR (1)
PR: Senior or advanced junior standing and CC. May be repeated once. (S/U grade only.)

FOR GRADUATE STUDENTS ONLY

GLY 603. RECENT NERITIC SEDIMENTATION (5)
PR: GLY 504 or CC. Environmental/tectonic factors and resulting sediment types in shallow marine environments. Application to problems in stratigraphy and petroleum studies. lec-lab.

GLY 604. RECENT FLUVIAL AND TRANSITIONAL SEDIMENTATION (4)
PR: GLY 504 or CI. Environmental factors and resulting sediment types accumulated in fluvial and transitional environments. lec-lab.

GLY 605. OCEANIC SEDIMENTATION (5)
PR: GLY 504 or CI. Structural development, sedimentation processes, and sediments of shoreline, continental slope, continental rise, and abyssal plain environments. lec-lab.

GLY 607. CARBONATE PETROLOGY I (4)
PR: GLY 503 or CC. Genesis of recent carbonate sediments and the interpretation of ancient carbonate rocks by the use of conceptual models. Field-lab-seminar.

GLY 608. CARBONATE PETROLOGY II (4)
The second half of GLY 607.

GLY 611. ADVANCED IGNEOUS PETROGENESIS (4)
PR: CI. Detailed study of igneous rocks and their origin.

GLY 612. ADVANCED METAMORPHIC PETROGENESIS (4)
PR: CI. Detailed study and interpretation of metamorphism and the origin of metamorphic rock complexes, utilizing thin section microscopy, X-ray diffraction, and chemical analyses.

GLY 621. MARINE MICROPALeONTOLOGY (6)
PR: GLY 301, 303 or equivalents and CC. Principal groups of microfossils in marine sediments and cores. Paleocology, correlation, and application to petroleum and paleomarine problems.

GLY 631. CENOZOIC STRATIGRAPHY (3)
PR: GLY 531 or CI. Structural elements, paleogeography, stratigraphy, and economic resources of the Gulf of Mexico coastal plain. lec-lab.

GLY 652. DEVELOPMENT OF GROUND-WATER RESOURCES (5)
PR: GLY 553 or CC. Analysis of cause-effect relationships between ocean, streams, lakes and aquifers; planning and design of hydrogeology resources investigations, lecture-field-lab.

GLY 661. CLAY PETROLOGY (4)
PR: GLY 513, 561, or CC. Composition, structures, origin, and diagenesis of clay minerals. Identification of clay minerals by x-ray diffraction techniques.

GLY 673. HISTORY OF GEOLOGY (2)
PR: CC. Historical development of geologic thought. lec. Alternate years.

GLY 675. GEOLOGY OF FLORIDA (5)
PR: 24 hours of earth science credits or CI. Designed for teachers of earth science. Mineralogy, structure, stratigraphy, paleontology, geomorphology, tectonics, and petrology of Florida and contiguous areas. lec-field-lab. Alternate years.

GLY 681. GRADUATE RESEARCH GEOLOGY (1-15)
PR: CC. (S/U grade only).

GLY 683. SELECTED TOPICS IN MARINE GEOLOGY (1-6)
PR: CC. Sedimentary Petrology, Shoreline and Marine Physiography, Advanced Sedimentology, Shoreline Geology, Geology of Coastal Plain and Shelf, Geochronology, Geochemistry of the Ocean, Structure of Ocean Floor and Continental Mar-
GLY 688. RECENT ADVANCES IN GEOLOGY WITH EMPHASIS ON THEIR IMPACT ON COLLEGE-LEVEL COURSES. (3-6)
PR: Graduate Standing. Recent developments in geology that effect presentation of introductory material. (Credit not applicable toward thesis degree requirements.) (S/U grade only.)

GLY 689. DIRECTED TEACHING. (3-9)
PR: Graduate Standing. Supervised teaching of graduate teaching assistants in elementary and/or laboratory courses. (Credit not applicable toward thesis degree requirements.) (S/U grade only.)

GLY 691. GRADUATE SEMINAR (2)
PR: CC. (S/U grade only.)

GLY 699. THESIS (1-9)
PR: CC (S/U grade only.)

GERMAN
SEE MODERN LANGUAGES

GERONTOLOGY

Faculty: Rich, director; Lawton and Wilson, co-directors; Ososerman, Buckingham, Davis, Fleming, Geis, Gilmore, Guest, Kaplan, Kenerson, Krivanek, Saxon.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

AGE 501. PHYSIOLOGY OF AGING (3)
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 (3)
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 (3)
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 (2)
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 (3)
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 (2)
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 (3)
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)
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 (3)
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 (3)
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 (3)
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)
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. A continuation of AGE 611.

AGE 691, 692, 693, 694. SEMINAR IN SOCIAL GERONTOLOGY (2)
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.

AGE 695. FIELD PLACEMENT (12)
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.

HISTORY

Faculty; Dilkes, chairman; Belohlavek, Billingsley, Burke, Currey, DellaGrotte, Dillon, Jordan, Kleine, Mayer, Parker, Perez, Rollins, Silbert, Silver, Swanson, Tipps, Tsangadas, Wrong.

Part I

HTY 100. THE IDEA OF HISTORY (4)
Required of all history majors. The course deals with history conceived as a mode of inquiry, emphasizing the acquisition of the conceptual tools required for systematic, critical thought about human problems in the historical perspective. May be waived in the case of transfer students.

HTY 201, 202. ANCIENT HISTORY (4, 4)
PR: HTY 100 or CI. A survey study of the ancient civilizations 201 treats Near Eastern and Greek history to the beginning of the career of Alexander the Great; 202 treats the career of Alexander, the Hellenistic World, and Rome to the death of Constantine. Attention is drawn to the correlative work in CLS 321, Ancient Civilizations.
HISTORY

HTY 211, 212. AMERICAN HISTORY (4,4)
PR: HTY 100 or Cl. A history of the United States with attention given to relevant developments in the Western Hemisphere. 211: European origins to 1865; 212: 1865 to present.

HTY 221, 222. MEDIEVAL HISTORY (4,4)
PR: HTY 100 or Cl. A thematic survey of the Middle Ages. 221 deals with the nascent, Christian civilization of Europe, circa 300-1050 A.D.; 222 treats the mature medieval civilization of Europe, circa 1050-1500.

HTY 231, 232. MODERN EUROPEAN HISTORY (4,4)
PR: HTY 100 or Cl. A thematic survey of Europe in the modern age. 231 treats the period from the Renaissance to the French Revolution; 232, from the French Revolution to the present.

HTY 251, 252. LATIN AMERICAN HISTORY (4,4)
PR: HTY 100 or Cl. A thematic survey of the Iberian-Indian civilization in the New World from the 15th through the 20th Centuries. 251 treats the period from discovery to the independence movements of the 19th Century; 252, the Ibero-American states from the Wars of Independence to the present.

Part II

HTY 301, 302. A HISTORY OF THE AMERICAN COLONIAL PERIOD (4,4)
PR: HTY 100, 211, 212, or Cl. A study of European interest and involvement in America from the Age of Reonaissance to 1789 with emphasis on institutional development and the establishment of the American national system.

HTY 303, 304. AGE OF EXPANSION AND CONTINENTAL DEVELOPMENT (4,4)
PR: HTY 100, 211, 212, or Cl. A study of the formation of the American national state and its continental expansion. 303 covers the period from 1783 to 1815; 304 focuses on the years to the Compromise of 1850.

HTY 311, 312. THE AMERICAN SOUTH (4,4)
PR: HTY 100, 211, 212, or Cl. A chronological study of the South in its relation to the rest of the United States. 311 treats the origins and growth of southern institutions and thought; 312, the South and the nation.

HTY 315, 316. THE CIVIL WAR AND ITS AFTERMATH (4,4)
PR: HTY 100, 211, 212, or Cl. A study of the causes of the Civil War and the factors, forces, and atmosphere which produced the reconstruction policy following the war.

HTY 317. HISTORY OF FLORIDA (4)
A history of Florida and the Caribbean. Florida as an area of discovery, colonization and imperial conflict; the emergence of Florida within its regional setting.

HTY 319, 320. THE EMERGENCE AND GROWTH OF MODERN AMERICA (4, 4)
PR: HTY 100, 211, 212, or Cl. A study of the transition of American society from the end of Reconstruction to the present. 319 treats the era from 1877 to World War I; 320 focuses on the period from World War I to the present.

HTY 321, 322. ANCIENT GREECE (4,4)
PR: HTY 100, 201, 202, or Cl. A study of Greece in the ancient period. 321 offers instruction in the pre-Hellenic and Hellenic periods, to the death of Philip II of Macedon; 322 treats the career of Alexander the Great and the Hellenistic period. Attention is drawn to the correlative work in CLS 527, Greek Civilization.

HTY 324. MEDIEVAL SPAIN AND PORTUGAL (4)
PR: HTY 100, 221, 222, or Cl. A study of the peoples of the Iberian Peninsula in the Middle Ages.

HTY 325, 326. ANCIENT RÔME (4, 4)
PR: HTY 100, 201, 202, or Cl. A study of Rome in the ancient period.
325 treats the development of Rome to the end of the Republic, 27 B.C.; 326 offers instruction in the development of the Roman Empire from 27 B.C. to the death of Constantine, A.D. 337. Attention is drawn to the correlative work in CLS 529, Roman Civilization.

**HTY 327, 328. MEDIEVAL INSTITUTIONAL HISTORY** (4, 4)

PR: HTY 100, 221, 222, or CI. A study of the major institutions of feudal Europe. 327 treats the history of the Empire and Papacy; 328 deals with the history of the Western monarchies.

**HTY 329. MEDIEVAL ENGLISH HISTORY** (4)

PR: HTY 100, 221, 222, or CI. A study of the major developments in England from the Anglo-Saxon period to the 15th Century.

**HTY 333, 334. FRENCH HISTORY** (4, 4)

PR: HTY 100, 231, 232, or CI. A study of the major developments of French history in the modern period. 333 deals with the period from the Renaissance to the French Revolution; 334, from the Revolution to the present.

**HTY 335, 336. GERMAN HISTORY** (4, 4)

PR: HTY 100, 231, 232, or CI. A study of the major developments of German history. 335 deals with the period from the Reformation to the French Revolution; 336, from the Revolution to the present.

**HTY 337, 338. RUSSIAN HISTORY** (4, 4)

PR: HTY 100, 231, 232, or CI. A study of the primary social, economic, and cultural forces which have shaped the historical development of Russia. 337 treats the period to 1855; 338, 1855 to present.

**HTY 340. HISTORY OF MODERN ITALY—1861 TO PRESENT** (4)

PR: HTY 100, 231, 232, or CI. A critical thematic approach with emphasis on a socio-psychological examination of bourgeois liberalism and nationalism, the crisis of liberalism, the rise of the Italian socialist movement, World War I, and the Fascist synthesis.

**HTY 341, 342. BRITISH HISTORY** (4, 4)

PR: HTY 100, 231, 232, or CI. A study of the major developments of British history. 341 treats the period from the Reformation to 1715; 342, from 1715 to present.

**HTY 345, 346. BRITISH EMPIRE AND COMMONWEALTH** (4, 4)

PR: HTY 100, 231, 232, or CI. A study of the old and new empires with emphasis upon the evolution of the Commonwealth.

**HTY 347. HISTORY OF CANADA** (4)

PR: HTY 100 or CI. A study of the major themes in the political and social development of Canada, with particular emphasis on the origins and development of French-Canadian nationalism, continentalism, and dominion-provincial relations.

**HTY 353. HISTORY OF MEXICO** (4)

PR: HTY 100, 251, 252, or CI. A study of Mexican history from discovery to the present, with emphasis on the empire and republican periods.

**HTY 355. HISTORY OF BRAZIL** (4)

PR: HTY 100, 251, 252, or CI. A study of Brazilian history from discovery to the present with emphasis on the empire and republican periods.

**HTY 365, 366. BYZANTINE HISTORY** (4, 4)

PR: HTY 201-202, or HTY 221-222, or CI. A thematic treatment of the history of the Byzantine Empire, including social, economic, religious, political, military, ecclesiastical developments, together with consideration of literature, learning, and the arts. HTY 365 deals with the period from 324 A.D. to 867; HTY 366 deals with the period of Imperial Byzantium, including its decline and fall: 867-1453 A.D.

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**Part III**

**HTY 401, 402. SOCIAL & INTELLECTUAL HISTORY OF THE ANCIENT WORLD** (4, 4)

PR: HTY 100 and 201-202 and 321-322 or 325-326 or CI. Selected topics in
the social and intellectual history of the ancient world. 401 treats the period of ancient Greece; 402 treats the period of ancient Rome.

HTY 409, 410. A HISTORY OF AMERICAN FOREIGN RELATIONS (4,4)
PR: HTY 100, 211, 212, or CI. The development of American foreign relations from the Revolution to the present. HTY 409 deals with earlier period to 1877; HTY 410, with the period from 1877 to present.

HTY 411, 412. AMERICAN SOCIAL AND INTELLECTUAL HISTORY (4,4)
PR: HTY 100, 211, 212, or CI. A study of the major religious and philosophical ideas of the American people in relation to the nation's social environment. 411 deals with the earlier period to 1865; 412, from 1865 to present.

HTY 421, 422. A HISTORY OF THE AMERICAN ECONOMIC PROCESS (4,4)
PR: HTY 100, 211, 212, ECN 201, 202, or CI. The development of American economic thought and policies from the colonial period to the present, emphasizing the inter-relationship of economic development with the major political, ideological, and institutional currents of American history. A student may not receive credit for both HTY 421, 422, and ECN 371.

HTY 423. MEDIEVAL THOUGHT AND CULTURE (4)
PR: HTY 100, 221, 222, or CI. A study of the culture and the major intellectual developments of the medieval world.

HTY 425, 426. A HISTORY OF THE RENAISSANCE AND REFORMATION PERIODS (4,4)
PR: HTY 100, 231, 232, or CI. HTY 425 deals with the European Renaissance; HTY 426 with the major developments of Reformation Europe.

HTY 427, 428. EUROPE IN THE BAROQUE AND ENLIGHTENMENT PERIODS (4,4)
PR: HTY 100, 231, and any two of courses 333, 335, 337 and 341 or CI. A study with emphasis on comparative developments. 427 deals with major topics of the Baroque period; 428, with the Enlightenment.

HTY 429, 430. EUROPE IN THE NINETEENTH AND TWENTIETH CENTURIES (4,4)
PR: HTY 100, 231, 232, or CI. A study with emphasis on comparative developments. 429 treats the Nineteenth Century; 430, the Twentieth Century.

HTY 431, 432. EUROPEAN SOCIAL AND INTELLECTUAL HISTORY (4,4)
PR: HTY 100, 231, 232, or CI. Selected topics in the social and intellectual history of modern Europe. 431 treats the early modern period; 432, the Nineteenth and Twentieth centuries.

HTY 451. A HISTORY OF INTER-AMERICAN RELATIONS (4)
PR: HTY 100, 251, 252, or CI. An examination of the mutual problems of the American nations since independence with emphasis upon the development of Pan Americanism and the Organization of American States.

HTY 453. SOCIAL AND INTELLECTUAL HISTORY OF LATIN AMERICA (4)
PR: HTY 100, 251, 252, or CI. A study of the origins and development of major intellectual and social trends affecting the histories of the Latin American people.

HTY 455. STUDIES IN TUDOR-STUART ENGLAND (4)
PR: HTY 100, 231, 232, or CI. Selected topics in the history of Sixteenth and Seventeenth Century England.

HTY 461. REVOLUTION IN THE MODERN WORLD (4)
PR: HTY 100, 231, 232, or CI. An analytical and comparative study of the nature of revolution in modern history leading to a development of a paradigm of the revolutionary process.

HTY 464. FASCIST AND OTHER TOTALITARIAN SYSTEMS (4)
PR: HTY 100, 231, 232, or CI. A critical and comparative study of the growth of Fascist and other bureaucratic totalitarian movements in the 19th and 20th century western world: a socio-psychological analysis.

HTY 465. SCIENCE AND CIVILIZATION (4)
PR: HTY 100, 231, 232, or CI. A comparative survey of the impact of science on Western civilization from the ancient Egyptians to the present, emphasizing
the relationship of science to the socio-economic, political, and intellectual development.

HTY 485. DIRECTED READING (1-4)
PR: Arrangement with instructor prior to registration. Readings in special topics.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

HTY 587. THEORY OF HISTORY (4)
PR: to be taken during the senior year. An investigation of the philosophical problems of history, with emphasis on the evolution of the discipline.

HTY 591. PRO-SEMINAR IN HISTORY (4)
Advanced topics in the fields emphasizing readings, discussion, research, and writing. One pro-seminar is required of all history majors. Non-majors may enroll with the consent of the instructor. Topics vary within each field.

HTY 592. SENIOR SEMINAR IN HISTORY (4)
Introduction to the methods of historical research and writing, bibliography, and directed research in special topics designed to meet the particular needs and interests of individual students.

FOR GRADUATE STUDENTS ONLY

HTY 600. ANALYSIS OF HISTORICAL KNOWLEDGE (4)
A study of history as a form of knowledge with emphasis on epistemological considerations of the explanation devices and models of the discipline.

HTY 601. THEORY AND INTERPRETATION (4)
A systematic examination and evaluation of various schools of historical interpretation.

HTY 602. HISTORY AND THE SOCIAL SCIENCES (4)
An examination of the conceptual modes and methodology of the other disciplines with emphasis upon their application to historical research.

HTY 680. COLLOQUIUM IN HISTORY (4)
Reading and discussion of selected topics within the fields. Subject and scope to be determined by the instructor. May be repeated for credit.

HTY 685. READINGS IN HISTORY (1-4)
Arrangement with instructor prior to registration and CC. Individual reading and discussion of selected problems. May be repeated for credit.

HTY 691. SEMINAR IN HISTORY (4)
Research in selected problems within the fields. Subject and scope to be determined by the instructor. May be repeated for credit. The master's candidate is required to satisfactorily complete work in at least one graduate seminar to fulfill the requirement for the Master's Degree in History.

HTY 699. THESIS IN HISTORY (1-8)
Required of all candidates for the Master's Degree in History.

HUMANITIES

Faculty: Kiefer, chairman; T. Burns, Conway, C. Cooper, Gowen, Hoffman, Juergensen, Kashdin, Koenig, MacKay, McRae, Rutenberg, Shackson, Spillane, Watkins, Zylystra.

HUM 311, 312, 313. HUMANITIES AND HUMANE VALUES (5,5,5)
PR: CBS requirement in humanities or CI. Masterpieces of music, visual arts, theater, literature, and philosophy in varying cultural and historical situations.

HUM 411, 412. TWENTIETH-CENTURY ARTS AND LETTERS (5,5)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the twentieth century.

HUM 415, 416. ARTS AND LETTERS OF THE ROMANTIC PERIOD (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the romantic period.
HUM 417, 418. NINETEENTH-CENTURY ARTS AND LETTERS (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the nineteenth century.

HUM 419, 420. THE ENLIGHTENMENT (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the Enlightenment.

HUM 423, 424. RENAISSANCE ARTS AND LETTERS (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the Renaissance.

HUM 427, 428. MEDIEVAL ARTS AND LETTERS (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the middle ages.

HUM 431, 432. CLASSICAL ARTS AND LETTERS (4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the ancient world.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

HUM 535, 536, 537. HUMANITIES IN AMERICA (4,4,4)
PR: CBS requirement in humanities or CI. Case studies in the arts and letters of the United States.

HUM 539, 540. SELECTED NON-WESTERN HUMANITIES (4,4)
PR: CBS requirement in humanities or CI. Materials chosen from the arts and letters of Asia, Africa, Oceania, and the Middle East. May be repeated for credit.

HUM 541. HUMANITIES IN THE ORIENT: INDIA (4)
PR: CBS requirement in humanities or CI. Examples from the arts and letters of India and the relationship of these arts to the Hindu and Buddhist philosophy-religions.

HUM 542. HUMANITIES IN THE ORIENT: CHINA (4)
PR: CBS requirement in humanities or CI. Examples from the arts and letters of China; their relationship to Taoism, Confucianism and other Chinese philosophies; Western influences on 20th-century Chinese arts and letters.

HUM 543. HUMANITIES IN THE ORIENT: JAPAN (4)
PR: CBS requirement in humanities or CI. Examples from the arts and letters of Japan, their relationship to Zen Buddhism and other Japanese philosophy-religions; Western influences on 20th-century Japanese arts and letters.

HUM 545. LATIN AMERICAN ARTS AND LETTERS (4)
PR: CBS requirement in humanities or CI. Analysis of selected Latin American works of art in their cultural context.

HUM 581. DIRECTED STUDY (1-5)
PR: CBS requirement in humanities and CI. Specialized individual study determined by the student's needs and interest.

HUM 591. SELECTED PROBLEMS IN HUMANITIES (3)
PR: Senior classification and CI. Problems in the interrelationships among the fine arts and the natural, social and behavioral sciences. A senior essay for humanities majors.

FOR GRADUATE STUDENTS ONLY

HUM 611. STUDIES IN CONTEMPORARY ARTS AND LETTERS (4)
Concentration on major artists and recent trends.

HUM 623. STUDIES IN THE RENAISSANCE (4)
Masterpieces and major artists of the Renaissance in Europe and England.

HUM 681. DIRECTED STUDY (1-4)
Specialized independent study determined by the student's needs and interests.

HUM 683. SELECTED TOPICS IN HUMANITIES (1-4)
Each topic is a course of study in a subject not covered by a regular course.
LANGUAGE-LITERATURE (Interdisciplinary)

Faculty; Bentley, J.B. Camp, Carr, Cole, Deer, Gould, O'Hara, Robertson, Stanton.

LLI 301, 302. MAIN CURRENTS OF WESTERN THOUGHT I & II (3,3)
A study of the principal forces that have shaped Western thought since 1500. These include humanism, Protestantism, rationalism, romanticism, communism, and naturalism. Among the authors included in the course are Machiavelli, Swift, Newman, Freud, Dreiser, and Camus. 301: 1500-1720; 302: 1720-present.

LLI 305. THE IDEA OF PROGRESS (4)
A study of the ways in which the idea of progress has affected philosophical, social, political and literary theory since the Renaissance to the French revolution. Among the authors considered are: Bacon, Descartes, Pascal, Locke, Condorcet, Malthus, and Adam Smith.

LLI 306. THE IDEA OF UTOPIA (4)
A study of the relationship between the idea of progress and the growth of modern ideologies. Emphasis will be placed on the development of liberalism, Utopian socialism, social Darwinism and conservatism by the study of such authors as: Burke, T. Paine, J.S. Mill, R. Owen, T. Huxley, G. Orwell, and A. Malraux.

LLI 315. THE IDEA OF FREEDOM (3)
An analysis of the idea of freedom, both in general and in particular. Various philosophical, literary, and journalistic aspects will be analyzed: metaphysical, ethical, political, social, religious and economic.

LLI 321. LITERATURE AND THE OCCULT (4)
An introduction to the occult tradition as a major ingredient in English, Continental, and American literature; analysis of the origins, classifications, and areas of the various “black,” or magic arts, including astrology, necromancy, spells, charms, occult practices, esoteric rites, from classical times through the present.

LLI 383. SELECTED TOPICS (3-5)
Course contents depend on students' need and instructor's interest. Agreement with instructor required prior to registration.

LLI 401. THREE CENTRAL IDEAS IN WESTERN CULTURE:
HIERARCHY, MECHANISM AND ORGANISM (4)
A humanistic study of the structure and function of the three seminal ideas of hierarchy, mechanism and organism, with the main emphasis upon their significant influence in art, science and letters to 1900.

LLI 402. DOMINANT IDEAS IN THE 20TH CENTURY (4)
The impact of major scientific hypothesis on the various forms of cultural expression.

LLI 411. THE ROMANTIC IDEA OF THE SELF (4)
An investigation of the Romantic idea of the self as revealed in the works of major writers, philosophers, and psychologists of the 19th Century, with emphasis on the impact of this idea on contemporary thought.

LLI 483. SELECTED TOPICS (2-5)
PR: CI. Junior standing. Course contents depend on students’ need and instructor’s interest. Agreement with instructor required prior to registration.

LLI 583. SELECTED TOPICS (2-5)
PR: CI. Course contents depend on students’ need and instructor’s interest. Agreement with instructor required prior to registration.

LINGUISTICS

Faculty; Cole, chairman; Caflisch, Gessman, O’Hara, Silverman, Wall

LIN 301. INTRODUCTION TO LINGUISTICS (4)
Introduction to the basic principles of linguistic science: phonological and
grammatical analysis and description; language change and genetic relationships.

LIN 483. SELECTED TOPICS (3-5)
PR: CI. Course content depends upon students’ needs and instructor’s interest and may range over the entire field of linguistics.

FOR UPPER LEVEL AND GRADUATE STUDENTS

LIN 511. HISTORY OF LINGUISTIC THOUGHT (4)
Survey of the development of language study in the West from Antiquity to the present: Classical and medieval theories of language; origins of traditional grammar; rationalist linguistic theory and philosophical grammar, and an examination of the origin of contemporary linguistic controversies.

LIN 530. FIELD METHODS (4)
PR: LIN 301 and SPE 503. An introduction to the techniques of gathering language data in the field and to making an analysis of such data. Native informants are brought on campus to replicate the field experience: students will become familiar with equipment and tools used by linguists in the field.

LIN 540. THE SOCIAL STRUCTURE OF LANGUAGE (4)
PR: LIN 301, ENG 517, or, ENG 535. An analysis of the interrelation of a language and the structure of the society using it. The linguistic behavior patterns characteristic of particular social, political, economic, educational, and racial groups. Problems in communication between strata.

LIN 541. PSYCHOLINGUISTICS (4)
PR: CI. The nature of linguistic structure and its correlates in behavior and perception. Examination of the hypotheses of Whorf, Chomsky, and others.

LIN 543. KINESICS (4)
PR: CI. Introduction to kinesics and paralinguistics: the language of gesture, semiotics, religious ritual, and other significant areas of non-verbal communication.

LIN 551. STUDIES IN COMPARATIVE STRUCTURE (5)
PR: CI. An introduction to linguistic typology consisting in a systematic comparison of characteristic representatives of the various language types, such as Vietnamese, Malay, Hungarian, Swahili, Sanskrit, Hebrew, and others. No knowledge of any of these languages on the part of the student is presumed.

LIN 581. INDIVIDUAL RESEARCH (3-5)
PR: CI. Specialized individual work in area of student’s interest.

LIN 583. SELECTED TOPICS (3-5)
PR: CI. Course content depends upon students’ needs and instructor’s interest and may range over the entire field of linguistics. Study of languages not otherwise offered, such as Japanese and Hindi. Enrollment can be repeated.

LIN 585. DIRECTED READING (4)
PR: CI. Readings in special topics. Must be arranged prior to registration.

FOR GRADUATE STUDENTS ONLY

LIN 601. PHONOLOGICAL DESCRIPTION (4)
Analysis of the phonological component of a grammar, its role and formal structures. The generative model is compared to taxonomic descriptions. Theory and data-solution problems.

LIN 602. SYNTACTIC DESCRIPTION (4)
Analysis of syntactic descriptions of various languages through data-solution problems in co-occurrence relations, agreement, permutation, conjoining, and embedding. Feature grammars and other models are discussed.

LIN 611. HISTORICAL LINGUISTICS (4)
An advanced survey of the principles and methodology of historical linguistics.
LIN 612. COMPARATIVE LINGUISTICS (4)
The principles and methodology of comparative linguistics, focusing upon a major Indo-European subfamily, such as Romance, Germanic, or Balto-Slavic.

LIN 621. STUDIES IN SEMANTICS (4)
Selected problems in the area meaning and the relationship between linguistic structure and cognition. Mappings of presupposition, kinship fields, emotive concepts, and other problems are surveyed. Theories such as Fodor-Katz-Chomsky, Ross-Lakoff-McCawley, and others are contrasted.

LIN 631. FORMAL STYLISTICS (4)
Studies in the relationship between the development of language study and literary criticism; developments in modern linguistic theory and their application to problems of aesthetics, literary structure, and style.

LIN 641. PRINCIPLES OF ENGLISH AS A SECOND LANGUAGE (4)
Analysis of the phonological, morphological, and syntactic features of English as a basis for linguistic application to problems of English language acquisition by non-native speakers.

LIN 661 TOPICS IN THEORETICAL LINGUISTICS (4)
Offerings will include current issues in any area of linguistic theory.

LIN 671. TOPICS IN APPLIED LINGUISTICS (4)
Offerings may include topics in such fields as sociolinguistics, psycholinguistics, and stylistics.

LIN 683. SELECTED TOPICS (3-5)
Content will depend upon instructor’s interests and students’ needs. Such topics as computational and mathematical linguistics, biolinguistics, dialectology and linguistic geography, and pidgins and creoles may be treated, as well as the study of the structures of languages not ordinarily taught.

LIN 685. DIRECTED READING (3-5)
Readings in special topics and specialized individual work. Must be arranged prior to registration.

LIN 699. RESEARCH AND THESIS (1-8)
Required of all candidates for the M.A. degree in Linguistics. Registration may be repeated, but accumulated credit may not exceed eight hours.

For a list of courses outside the core that may count toward the major in Linguistics, see the program requirements on P. 115.

ITALIAN
See MODERN LANGUAGES

JOURNALISM
See MASS COMMUNICATIONS

MANAGEMENT
(Form former prefix: MGT)


MAN 301. PRINCIPLES OF MANAGEMENT (5)
Organized system of concepts running the gamut from quantitative to behavior sciences which provide broad overview of science of management.
MAN 311. MANAGEMENT SYSTEMS (3)
PR: MAN 301, GBA 333, ECN 331. Study of interface between environment and open systems. Analysis and design of computer and noncomputer systems as tools in management planning and control.

MAN 321. BEHAVIORAL FACTORS IN ORGANIZATIONS (3)
PR: MAN 301 or CI. Integrates concepts learned in CBS Behavioral Area (or equivalent) into managerial framework. Includes theories of communication, delegation, discipline, group, motivation, needs, perception and rules.

MAN 331. INDUSTRIAL RELATIONS (3)
PR: MAN 301 or CI. Impact of unionization on management flexibility in decision making. Emphasis on theories and models that when applied bear upon how best to manage in union organized workplace in both public and private sectors.

MAN 341. PERSONNEL MANAGEMENT (3)
PR: MAN 301 or CI. Systematic analysis of multitude of functions in personnel; recruiting, selection, job evaluation, performance appraisal, wage and salary, incentives, training & development, etc., utilizing case approach.

MAN 421 OPERATIONS MANAGEMENT (3)
PR: MAN 311, GBA 351, ECN 331. Develops conceptual framework and principles applicable for any managerial decision process including proper utilization by line of staff expertise. Integrates previous courses into planning & control model.

MAN 431. ORGANIZATIONAL ANALYSIS (3)
PR: MAN 321 and Senior Standing. Theory and research findings from all previous management courses integrated by means of a rigorous conceptual model.

MAN 451. INTERPERSONAL DYNAMICS LABORATORY (3)
PR: MAN 321 or CI. More structured, content-oriented t-group model to provide, through task accomplishment, better awareness of application to modern management theory of concepts and tools from social sciences.

MAN 453. CHANGING ORGANIZATIONS (3)
PR: MAN 321 or CI. Central unifying concept is the Change Agent. Student exposed to total range of theory related to resistance to change and introduction of change including whether locus should be in or out of organization.

MAN 461. LEGAL CONSTRAINTS AND MANAGEMENT DECISION MAKING (3)
PR: MAN 331, GBA 361 or CI. Case analysis of legal constraints on managerial decision-making: FLSA; Workmen’s Compensation; Anti-discrimination laws; Lie Detectors & Psychological Testing; NLRB rulings, court decisions, statutes.

MAN 463. SEMINAR IN MANAGEMENT CONTRACT ADMINISTRATION AND SETTLEMENT (3)
PR: MAN 331 or CI. Case exercises to test application of tools and theories pertaining to I.R. and other management functions involving conflicting interest groups that must integrate or co-exist, interact and cooperate.

MAN 465. LABORATORY IN THE RESOLUTION OF CONFLICT (3)
PR: MAN 321 or CI. In depth exposure to panorama of interdisciplinary theories having relationship to dispute settlement in any context. Controlled laboratory testing of said theories through cases and/or management game.

MAN 471. MANAGEMENT SCIENCE I (3)
PR: MAN 421 or CI. Heavy emphasis upon population of calculus, matrix algebra, boolean algebra, set theory, probability and game theories, and other operations research techniques to management problem analysis.

MAN 472. MANAGEMENT SCIENCE II (3)
PR: MAN 471 or CI. Examination of Linear Programming, dynamic programming, queuing, stochastic inventory models, markov chain analysis for applications to problem analysis and decision making under uncertainty.

MAN 473. QUANTITATIVE METHODS OF OPERATION: PLANNING AND CONTROL (3)
PR: MAN 472 or CI. Review of all conceptual tools, methods and techniques available to modern scientific manager including depth integration of how and why of quantitative decision process at policy level.
MAN 489. GUIDED RESEARCH IN MANAGEMENT (3)
PR: Graduating Quarter or CC. Student engages in integrating field project, or other research, where all of his course work can be utilized. Only most general departmental supervision is exercised; management is by results.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

MAN 501. SURVEY OF MANAGEMENT (3)
An analysis of the theory and practice of management, including a study of the determination of goals and means, the functions of management, decision-making and the administrative process in general.

FOR GRADUATE STUDENTS ONLY

MAN 601. HUMAN RESOURCE MANAGEMENT (3)
Investigates some of the complex factors important for a basic understanding of human behavior in formal organizations. Within a systems framework (the variables considered are mutually dependent) and using the case method approach, discussion topics include motivational aspects of individual, inter and intra-group behavior.

MAN 602. ADMINISTRATIVE DECISION PROCESSES (3)
PR: GBA 603, GBA 605, (both may be concurrent). Analysis of the rational components of executive decision and action: objective functions, constraints, admissible courses of action, search, sequential learning and decision revision. Students build models of characteristic systems and use optimization techniques and heuristic simulation to investigate model properties.

MAN 603. ORGANIZATIONAL COMMUNICATIONS (3)
Analysis, organization, and presentation of research findings. Students learn through individual efforts and class discussion how to define a topic, organize data relevantly, and present written material in forms acceptable to industry and the academic community. Each student is expected to complete at least one research project and contribute to the efforts of his colleagues through group interaction in weekly “workshop” sessions which typify the class meetings.

MAN 606. ADVANCED MANAGEMENT SCIENCE (3)
PR: GBA 603. Study of current operations research techniques, including dynamic (non-linear) programming, Markov chain analysis as they apply to problems in the business firm.

MAN 607. SEMINAR IN INDUSTRIAL RELATIONS (3)
An in-depth study and analysis of critical and/or current problems in industrial relations.

MAN 608. SEMINAR IN OPERATIONS ANALYSIS (3)
PR: GBA 603. Analytical study of planning and control with particular stress on operational problems and decision-making. The use of simulation will be treated.

MAN 609. ADVANCED INTERPERSONAL DYNAMICS (3)
PR: MAN 601 or equivalent. The study of personal and interpersonal behavior through experience with the information via experiments, as well as a study of the relevant literature.

MAN 610. SEMINAR IN QUANTITATIVE METHODS I (3)
PR: GBA 603, GBA 605, MAN 606, MAN 608. Operational analysis of management measurements including: value analysis, cost-benefit analysis, payoff-trees and tables, PERT/CPM, the computer as a tool in managerial decisions. Stresses the functional use of quantitative methodology.

MAN 611 OR EQUIVALENT. SEMINAR IN ORGANIZATION THEORY (3)
PR: MAN 601. The study of the structure, functions, and dynamics of modern organizations. Stress is given to the contributions of behavioral science to analysis of formal and informal organizations.

MAN 613 OR EQUIVALENT. SEMINAR IN ORGANIZATIONAL CHANGE (3)
PR: MAN 601. The study of organizational change with special stress on adaptation
of the firm, or sub-strata of the firm, to environmental alteration. Intra-firm analysis, and sensitivity training are also covered.

**MAN 615. SEMINAR IN ADMINISTRATIVE POLICY (3)**

PR: Final quarter of M.S. degree program or CC. A course designed to present an organized and integrated approach to the managerial decision-making process. This course should be taken in the final quarter of the quarter of the program.

**MAN 699. FIELD RESEARCH OR THESIS (6).**

PR: Consent of Chairman.

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**MARINE SCIENCE**

Faculty: Humm, director & chairman; Full-time at St. Petersburg campus—Baird, Carder, Hopkins, Pyle; Associate faculty—Betz, Bloch, Briggs, Dawes, Flynn, Friedl, Griffin, Lawrence, Linton, Martin, Merner, Ross, Simon, Smyth, Strong, Taft.

**OGY 311. INTRODUCTION TO OCEANOGRAPHY (3)**

A survey of modern oceanography and its methods, including the important features of physical, chemical, biological and geological oceanography.

**FOR SENIOR LEVEL AND GRADUATE STUDENTS**

**OGY 521. CHEMICAL OCEANOGRAPHY (4)**

PR: CHM 213 and CI. The ocean as a chemical system, including composition, physical-chemical aspects, role of nutrients, trace metals, interaction between bottom and overlying water, modern methods of analysis in routine use in oceanography. lec-lab.

**OGY 531. GEOLOGICAL OCEANOGRAPHY (4)**

PR: Graduate standing or CI. An introduction to the physical, historical sedimentary, and structural geology of the ocean basins and their borders. lec-lab.

**OGY 541. PHYSICAL OCEANOGRAPHY (4)**

PR: Graduate standing or CI, PHY 225. The world ocean including its morphology, physical properties, currents, waves, tides, heat budget, and related topics. lec-lab.

**OGY 551. BIOLOGICAL OCEANOGRAPHY (4)**

PR: Graduate standing or CI, BIO 201-203. The study of life in the sea with special reference to distribution, reproduction, adaptation, competition, and populations. lec-lab. For students who have not majored in a biological science.

**FOR GRADUATE STUDENTS ONLY**

**OGY 681. GRADUATE RESEARCH (1-9)**

PR: CI. Directed research on non-thesis topics. May be repeated.

**OGY 691. GRADUATE SEMINAR IN OCEANOGRAPHY (1)**

PR: Graduate standing. May be repeated.

**OGY 699. M.A. THESIS (1-9)**

PR: CI. May be repeated to a maximum of 9 credits.

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**MARKETING**

Faculty: Sleeper, chairman; Carmichael, DeBord, Futhey, Heath, Nicholas, Oescher, Stevens, Towery, Wallace, B. M. Williams.

**MKT 301. BASIC MARKETING (5)**

PR: ECN 201-202 or CI. Survey of the marketing of goods and services within the economy. The integration of functional, commodity, and institutional approaches from the consumer and managerial viewpoints.
MKT 311. PRINCIPLES OF SALESMAIHSHIP AND SALES MANAGEMENT (3)
PR: MKT 301. Personal selling and sales management as basic elements in the marketing strategy of firms. Includes the scientific management of resources and the dynamics of interpersonal and small group behavior and decision processes.

MKT 312. PRINCIPLES OF ADVERTISING AND SALES PROMOTION (3)
PR: MKT 301. A comprehensive coverage of advertising, stressing purposes, techniques, organization, research, and media selection including relationships with other marketing mix components. Consideration given to economic and social aspects of advertising and total promotional strategies.

MKT 315. MARKETING INSTITUTIONS AND CHANNELS (4)
PR: MKT 301. A detailed study of marketing channels as a functional area of marketing management responsibility and as a part of marketing strategy. Attention given to wholesaling and retailing and their structural, dynamic interrelationships including distribution logistics.

MKT 316. MARKETING MODELS AND MARKETING SYSTEMS (3)
PR: MKT 301. A comprehensive coverage of advertising, stressing purposes, techniques, organization, research, and media selection including relationships with other marketing mix components. Consideration given to economic and social aspects of advertising and total promotional strategies.

MKT 317. RETAILING MANAGEMENT (3)
PR: MKT 301, MKT 315. A comprehensive analysis of the retailing structure, institutions and environment. To include pertinent management theories and practices of organizing, planning and controlling retail operations.

MKT 401. MARKETING LOGISTICS (3)
PR: MKT 315, ECN 331, GBA 333, or CI. Analysis of the logistics of marketing systems for firms engaged in the marketing of goods and services. Component parts of each system are studied and analytical tools are presented for selecting those alternatives which will attain the goals of the firm.

MKT 403. PUBLIC RELATIONS AND THE MARKETING PROCESS (3)
PR: MKT 312 or CI. Principles, practices, and problems in public relations as an integrated part of and supplement to marketing management responsibilities and decisions.

MKT 405. INDUSTRIAL MARKETING (3)
PR: MKT 315. Problems of marketing industrial goods. Characteristics of markets, channels, industrial sales, promotional practices, research and marketing policies.

MKT 407. MANAGEMENT OF ADVERTISING AND SALES PROMOTION (3)
PR: MKT 312, MKT 315. Discussion and analysis of cases bearing on managerial aspects of advertising and sales promotion including research, budget determination, strategy, tactics, and evaluation of results.

MKT 409. INTERNATIONAL MARKETING (3)
PR: MKT 312, MKT 315, or CI. A study of the procedures and problems associated with establishing marketing operations in foreign countries. The institutions, principles and methods involved in the solution of these business problems will be treated as well as effects of national differences on business practices.

MKT 411. MARKETING RESEARCH (4)
PR: MKT 312, MKT 315, ECN 331 or MTH 345; or CI. A study of research methods applicable to problem-solving in the field of marketing.

MKT 413. CONSUMER BEHAVIOR (3)
PR: MKT 301 or CI. An investigation and application of the behavioral factors affecting consumer demand. Consideration given to industrial, governmental, and ultimate consumers.

MKT 414. SEMINAR IN MARKETING AND CONSUMER BEHAVIOR RESEARCH (3)
PR: MKT 312, MKT 315, MKT 411, MKT 413. In-depth discussion, formulation application, and evaluation of advanced research techniques and practices as currently applied to facilitate marketing decisions.

MKT 417. RETAILING MANAGEMENT (3)
PR: MKT 301, MKT 315, MKT 413. A comprehensive analysis of the retailing structure, institutions and environment. To include pertinent management theories and practices of organizing, planning and controlling retail operations.

MKT 419. MARKETING MANAGEMENT PROBLEMS (4)
PR: MKT 411, MKT 413, and 3 other MKT courses, or CI. The integration of marketing knowledge applied to decision roles in managing the total marketing
effort of firms, and coordination with other major functional areas on specific problems.

MKT 489. SPECIAL STUDIES IN MARKETING (1-3)
PR: MKT major and CI. Intensive independent research in marketing under the direction of a major professor; progress and final analysis reported in seminar.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

MKT 501. SURVEY OF MARKETING (3)
PR: ECN 501. A critical analysis of the field of marketing including aspects of marketing policies, institutions, research, and trends. Special emphasis given to product development, pricing strategy, channel selection, and promotion as a basis for marketing management decisions. Assigned readings, discussions, and reports.

FOR GRADUATE STUDENTS ONLY

MKT 601. ADVANCED MARKETING PROBLEMS (3)
PR: MKT 301 or 501, ECN 605. A study of the marketing problems of the firm approached from a management point of view. Emphasis is placed upon the development of the student's ability to analyze marketing situations, identify problems, determine solutions, implement corrective action, and plan marketing strategy.

MKT 602. ANALYSIS FOR MARKETING MANAGEMENT (3)
PR: MTK 601, GBA 603, ECN 605, or CI. The use of quantitative techniques and analytical concepts in marketing decision making; marketing research model building and simulation; selected statistical decision techniques and computer applications.

MKT 603. SEMINAR IN MARKETING (3)
PR: MKT 301 or 501; ECN 601, 605. The study of contemporary marketing thought, advanced marketing concepts, and recent developments in the field of marketing. Readings, discussions, and individual investigation.

MKT 605. BEHAVIORAL CONCEPTS IN MARKETING DECISION MAKING (3)
PR: MKT 601 or CI. The application and techniques of the behavioral sciences to the understanding and improvement of the marketing process and decision making concerning consumer behavior.

MKT 607. SEMINAR IN PROMOTIONAL POLICY AND STRATEGY (3)
PR: MKT 605 or CI. An analysis of theories and practices of advertising, selling and sales management, and sales promotion as they relate to the total marketing program of firms. Emphasis upon the coordination of promotional policy and strategy.

MKT 609. MARKETING CHANNELS AND PHYSICAL DISTRIBUTION MANAGEMENT (3)
PR: MKT 602, MKT 605, or CI. An analysis of the development of integrated distribution systems. Channel alternatives including the institutions involved and physical flow as a part of marketing strategy.

MKT 611. MARKETING RESEARCH AND INFORMATION SYSTEMS (3)
PR: MKT 602, GBA 603, GBA 605, or CI. A study of the marketing research process, methods and techniques and the need and applicability of information systems.

MKT 683. DIRECTED RESEARCH IN MARKETING (1-6)
PR: MKT 601, MKT 602, and CI. Intensive advanced independent research in marketing guided by a marketing professor.

MASS COMMUNICATIONS

Faculty: Sanderson, chairman; Carr, Griscti, Horsman, Luoff, O'Hara, Parker, Stalnaker, Yates.

CBS 101. FRESHMAN ENGLISH (4)
One section each fall quarter is reserved for journalism-interest students.
COM 300. INTRODUCTION TO MASS COMMUNICATIONS (3)
The functions of agencies of mass communication and their impact upon society; critical analyses of press performance in relation to current events; evaluation of the press through a study of its history, with emphasis on the print media. (Formerly JNM 341.)

COM 301. THE POPULAR ARTS IN AMERICA (4)
A survey of the growth of the popular arts (motion pictures, radio, television, art, best sellers, jazz and other forms of music, the comics, etc.) as mirrors, transmitters and transformers of American cultural values.

MKT 312. PRINCIPLES OF ADVERTISING AND SALES PROMOTION (3)
For course description, refer to Department of Marketing section.

COM 313. ADVERTISING COPYWRITING AND LAYOUT (4)
PR: MKT 312, or CI. Application of persuasive writing techniques and principles of design and graphic arts to mass media advertising, including copy, visualization, layout, typography, print production, TV storyboards, radio commercials, film, etc.

COM 321. MAGAZINE ARTICLE AND FEATURE WRITING (4)
PR: CBS 102. Planning, researching, writing and marketing articles for general and special interest magazines and newspaper magazine supplements; experience in developing article ideas; inductive analysis of contemporary magazine articles. (Formerly JNM 349.)

COM 325. MAGAZINE EDITING (4)
PR: COM 330. Comparative study of types of magazines and businesspapers as to objectives and content; planning to meet magazine objectives and reader interest; article and photograph selection and preparation for printing; use of research methods in planning and evaluation; ethical and legal limitations and administrative problems of the editor.

COM 330. BEGINNING REPORTING (4)
PR: CBS 102. Basic instruction in news judgment, sources of news, news-gathering, and newswriting techniques. Typing ability is required. (Formerly JNM 342.)

COM 331. ADVANCED REPORTING (4)
PR: COM 330. Getting information and writing the more complex and specialized story; techniques of investigative and analytical reporting, including ethical and legal considerations. (Formerly JNM 343.)

COM 338. NEWSPAPER MANAGEMENT (2)
PR: COM 331 or CI. A pro-seminar to discuss advertising, business, circulation, mechanical, personnel, promotional, and news-editorial operations of the press with editors and managers of leading daily and weekly newspapers.

COM 341. PRINCIPLES OF PUBLIC RELATIONS (4)
PR: COM 330 and junior standing, or CI. The role and functions of public relations within corporate and institutional structures; ethical practices, especially as influences in shaping or altering public opinion.

COM 351. LITERATURE AND THE FILM (3)
PR: CBS 102. A study of what happens when a novel is adapted for the movies; of the insights of modern writers and literary critics into the motion picture as an art form analogous to, yet distinct from, literature and of the impact of literature on film-making. (Formerly LLI 311.)

COM 352. PHILOSOPHY AND THE FILM (3)
PR: CBS 102. A study of the philosophical implications of the motion picture as an art form: esthetics in general versus film esthetics, and the connections between the world views of such modern philosophers as Bergson, Whitehead and Bradley and the world view expressed through the motion picture; the connections between "pure ideas," the ideas in the documentary film, and the ideas in the fictional film. (Formerly LLI 312.)

COM 353. INTRODUCTION TO FILM WRITING (4)
PR: CBS 102 and CI. An introduction to the techniques of writing for the film with special emphasis on adaptations from fiction and examinations of scripts as models and as subjects for critical analysis. (Formerly LLI 313.)
COM 354. THE FILM AS MASS COMMUNICATION I: SYNTAX (4)
PR: CBS 102; and junior standing or CI. The language, conventions, elements and patterns of the film medium as related to current models of effective mass communication and new theories of non-verbal communication.

COM 355. THE FILM AS MASS COMMUNICATION II: RHETORIC AND STYLISTICS (4)
PR: COM 354 or CI. A continuation of COM 354 to include the effective arrangements of scenes and sequences in motion picture and television films.

COM 356. THE FILM AS MASS COMMUNICATION III: WORKSHOP (4)
PR: COM 355, or CI. Practical exercises, demonstrations and experiences in applying material covered in COM 354 and 355.

COM 357. CLASSICS OF THE SILENT FILM (4)
Examples of the silent film studied from social, intellectual, historical, and artistic points of view. (Formerly CBS 460.)

COM 358. CLASSICS OF THE SOUND FILM (4)
Examples of the sound film studied from social, intellectual, historical, and artistic points of view.

COM 371. PHOTOJOURNALISM I (4)
PR: CBS 102. Camera operation, darkroom techniques, picture composition; editing, ethics, history and laws in connection with photojournalism.

COM 372. PHOTOJOURNALISM II (4)
PR: COM 371 or CI. Extensive study and use of color in photography and newspaper production, including the theory and actual photomechanical color separation; study will be given to certain laws of science as they relate in photography to light, optics, films, chemicals, and color.

COM 375. TYPOGRAPHY I (4)
PR: CBS 102. The history and design of type, major classifications of type faces, typographic nomenclature, printer's measurements and the science of type design and identification.

COM 376. TYPOGRAPHY II (4)
PR: COM 375, or CI. A study of the history of typesetting, the emergence of computers and coldtype composition; extensive study and use of copyfitting methods for body type and headlines; principles of typography and photocomposition including readability and legibility.

COM 403. HISTORY AND PRINCIPLES OF COMMUNICATIONS LAW (4)
PR: Junior standing. Historic and Constitutional backgrounds of freedom and control of expression, statutory enactments, major Supreme Court cases, court decisions and administrative rulings which have shaped legal control of communications.

COM 425. MAGAZINE PLANNING AND PRODUCTION (4)
PR: COM 325, COM 371, COM 375. Research in new magazine design and production techniques; training in the creative use of typography, photography, art work, text in the "area concept"; letterpress and offset production; financial management of magazines; preparation of a detailed dummy for a model magazine.

COM 433. NEWS EDITING I (4)
PR: Com 331. Evaluating news and its display; editing and rewriting copy for the mass media, with emphasis on the daily newspaper; typography, makeup, and news judgment; ethical problems. (Formerly JNM 347.)

COM 434. NEWS EDITING II (4)
PR: COM 433. Continuation of COM 433, with more intensive practice on the copydesk in processing live copy and its display; evaluating, editing and headlining wire copy; managing the news desk. Laboratory work.

COM 441. WRITING FOR PUBLIC RELATIONS (4)
PR: COM 341. Persuasive writing formats and techniques unique to the practice of public relations; applied principles and ethical practices in problem-solving situations drawn from case studies; writing techniques used in publicity and promotional literature.

COM 451. SOCIAL HISTORY OF THE FILM TO 1945 (4)
PR: CBS 102. The industrial, technological, philosophical and social factors
bearing on the rise and development of the motion picture as a popular art. Intensive study of a series of films through screenings and readings.

**COM 452. SOCIAL HISTORY OF THE FILM, 1945 TO THE PRESENT (4)**
PR: CBS 102 and COM 451 or CI. A continuation of COM 451, covering the development of the film from 1945 to the present.

**COM 453. THE DOCUMENTARY FILM (4)**
PR: CBS 102. The development of the documentary movement: Kino-Pravda, Flaherty, Grierson and the GPO Unit, Reifenstahl, U.S. Government-sponsored films, the Canadian Film Board, Cinema Verite, Maysles, etc.

**COM 454. FILM CRITICISM (4)**
PR: Junior standing. The film as a mass medium, comparing and contrasting its mass communication aspects with other important aspects. Critical analyses of selected films and intensive readings in the theory of film. Literary, social dramatic, philosophic and historic approaches to film criticism.

**COM 481. INDIVIDUAL RESEARCH IN MASS COMMUNICATIONS (var.)**
PR: CC and CI. The course provides means for a student to do independent study in an area not covered by a numbered course.

**COM 483. SELECTED TOPICS IN MASS COMMUNICATIONS STUDIES (var.)**
PR: CI and junior standing. Courses designed to meet current or specific topics of interest to the instructor and students.

**COM 485. DIRECTED READINGS IN MASS COMMUNICATIONS STUDIES (var.)**
PR: CI and CC, and junior standing. Reading and directed study in special topics.

**COM 491. SENIOR SEMINARY: INTERCOMMUNICATION—THE MASS MEDIA IN PERSPECTIVE (4)**
PR: Senior standing and 12 hours of COM. The inter-relationships among the mass media and institutions; their effect upon each other and upon contemporary society.

**COM 500. THEORY OF MASS COMMUNICATIONS (4)**
PR: Senior standing. The nature of the mass communication process, its effects on individuals and groups; the moral, ethical, social and political implications in influencing and directing behavior. Analyses of theories of mass communication, primarily those of McLuhan, Schramm, Lazarsfeld, Seldes, Reisman, and Katz.

**COM 539. SEMINAR: PROBLEMS IN NEWS-EDITORIAL JOURNALISM (2)**
PR: Senior standing and COM 433 or COM 491, or CI. A study of the role of the free press in a democracy and its efforts to fulfill its social and ethical obligations by analyses and discussions of the problems which face the reporter, editor, and publisher.

**COM 541. PUBLIC INFORMATION (4)**
PR: Senior standing and COM 341, or CI. The functions and obligations of information specialists as public employees in reporting news of increasing complex government to the people.

**COM 551. INDIVIDUAL RESEARCH IN MASS COMMUNICATIONS (1-4)**
PR: Senior standing, CI and CC. The course provides means for a student to do independent study in an area not covered by a numbered course.

**COM 583. SELECTED TOPICS IN MASS COMMUNICATIONS STUDIES (1-4)**
PR: Senior standing or CI. Courses designed to meet current or specific topics of interest to the instructor and students.

**COM 585. DIRECTED READINGS IN MASS COMMUNICATIONS STUDIES (1-4)**
PR: Senior standing, CI and CC. Reading and directed study in special topics.

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**MATHEMATICS**

*Faculty:* Ratti, chairman; Braun, Chesley, Clark, Gard, Goodman, Isaak, Liang, Lieberman, Y-F. Lin, Manougian, Michaelides, Mukherjea, Pothoven, Price, J. H. Reed, E. Saff, Snider, Thieleker, Tserpes, Zerla.
MTH 101. FOUNDATIONS OF UNIVERSITY MATHEMATICS (5)
PR: Two years of secondary school algebra, one year of plane geometry. Real numbers and their properties; introduction to analytic trigonometry and geometry. (No student who has previously earned a “C” or better in MTH 211 or MTH 302 or their equivalents will receive credit for MTH 101.)

MTH 211. ELEMENTARY CALCULUS I (4)
PR: Two years of secondary school algebra, one year of plane geometry or C.C. Real numbers exponential, logarithmic and trigonometric functions. The sequence MTH 211-212-213 is primarily for students from Biological Sciences, Social Sciences and Business. (No credit for math majors or students with credit in MTH 101.)

MTH 212. ELEMENTARY CALCULUS II (4)
PR: MTH 211 or CC. Rules for differentiation, applications of the derivative, definite integral, fundamental theorem of calculus, integration. (No credit for students with credit in MTH 302.)

MTH 213. ELEMENTARY CALCULUS III (4)
PR: MTH 212. Functions of several variables, partial derivatives, introduction to infinite series (No credit for students with credit in 302.)

MTH 302. CALCULUS I (5)
PR: MTH 101 with a grade of “C” or better or CC. Limits derivatives applications, definite integral.

MTH 303. CALCULUS II (4)
PR: MTH 302 with a grade of “C” or better or CC. Antiderivatives, the definite integral, applications, log, exponential, and trig functions.

MTH 304. CALCULUS III (4)
PR: MTH 303 with a grade of “C” or better or CC. Integration, polar coordinates, conic sections, vectors, indeterminate forms and improper integrals.

MTH 305. CALCULUS IV (4)
PR: MTH 304 with a grade of “C” or better or CC. Vectors in 3-space, partial derivatives, multiple integrals, infinite series.

MTH 309. SET THEORY (3)
PR: MTH 302 or CC. Relations, functions, order, cardinal numbers.

MTH 323. LINEAR ALGEBRA (4)
PR: MTH 302 or CC. Vectors, matrices, systems of linear equations, linear transformations.

MTH 345. INTRODUCTORY STATISTICS I (5)
Hypothesis testing, estimation; normal, Chi-square, t, F, binomial, multinomial, distributions; ANOV, CR, RCB designs; single df, regression, correlation, contingency tables. Students who successfully complete this course may not also receive credit for either ECN 331-431 Business and Economic Statistics or SSI 301 Social Science Statistics.

MTH 346. INTRODUCTORY STATISTICS II (5)
PR: MTH 345 or CC. Factorials, ANCOV; multiple curvilinear regression; response surfaces; Latin square, Split Plots, incomplete blocks designs; distribution free methods.

MTH 401. DIFFERENTIAL EQUATIONS (4)
PR: MTH 305. First order linear and nonlinear differential equations, higher order linear equations, applications.

MTH 405. ADVANCED CALCULUS I (4)
PR: MTH 305 with a grade of “C” or better. Functions of several variables, partial derivatives, implicit-function theorems, transformations.

MTH 406. ADVANCED CALCULUS II (4)
PR: MTH 405. Continuation of MTH 405.

MTH 420. ELEMENTARY ABSTRACT ALGEBRA (3)
PR: MTH 309 or CC. Groups, rings, integral domain, fields, integers, the rational, real and complex number systems.

MTH 423. GEOMETRY I (3)
PR: MTH 302. Emphasis on axiomatics, advanced Euclidean geometry, elements of projective geometry, non-Euclidean geometries.
MTH 424. GEOMETRY II (3)
PR: MTH 423. Continuation of MTH 423.

MTH 431. VECTOR ANALYSIS (3)
PR: MTH 305. The algebra and calculus of vectors, applications, general coordinates, introduction to tensor analysis.

MTH 445. INTRODUCTORY PROBABILITY THEORY I (3)
PR: MTH 305 and MTH 309 or CC. Probability spaces, discrete and continuous probability distributions, expectations.

MTH 446. INTRODUCTORY PROBABILITY THEORY II (3)
PR: MTH 445. Joint distributions, sums of random variables, weak and strong laws of large numbers, limit theorems.

MTH 447. NUMERICAL ANALYSIS (4)
PR: MTH 401. Interpolation and quadrature, finite differences, numerical solution of algebraic and transcendental equations, numerical solutions of differential equations, computer techniques.

MTH 471. THE SCOPE AND SIGNIFICANCE OF MATHEMATICS (3)
(For non-science majors)
PR: Senior or junior standing. Students having completed MTH 302 are not eligible to enter this course. The development of mathematical thought and its application to the physical world, the social sciences, and the fine arts, emphasizing the importance and meaning of mathematics in contemporary culture.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

MTH 501. ADVANCED DIFFERENTIAL EQUATIONS (4)
PR: MTH 401 or CC. Series solutions of second order linear equations, boundary value problems, existence theorems and Fourier series.

MTH 510. ELEMENTARY MATHEMATICAL LOGIC (3)
PR: CC. Truth tables, tautologies, quantifiers, rules of inference, informal proofs in mathematics.

MTH 511. ADVANCED LINEAR ALGEBRA (4)
PR: MTH 309, 323 or CC. Vector spaces, linear independence, dimension, matrices, linear transformations.

MTH 513. REAL ANALYSIS I (4)

MTH 514. REAL ANALYSIS II (4)
PR: MTH 513. Continuation of MTH 513.

MTH 515. CALCULUS ON MANIFOLDS (4)
PR: MTH 511 and 514. Calculus of several variables.

MTH 520. COMPLEX ANALYSIS I (4)
PR: MTH 405. Complex numbers, analytic functions and mappings, integrals.

MTH 521. COMPLEX ANALYSIS II (4)
PR: MTH 520. Power series, residues and poles, conformal mapping.

MTH 523. ALGEBRA I (4)
PR: MTH 305 and 309. Semi-groups and groups. Rings and ideals; homomorphisms.

MTH 524. ALGEBRA II (4)
PR: MTH 523. Polynomial rings, integral domains; factorization. Fields and field extensions; reducibility.

MTH 531. TOPOLOGY I (4)

MTH 532. TOPOLOGY II (4)
PR: MTH 531. Continuation of MTH 531.

MTH 541. APPLIED MATHEMATICS I (4)
PR: MTH 401 or CC. Elements of complex analysis, Laplace transforms, Fourier
series, and Fourier transforms. Mathematical techniques for scientists and engineers. Equivalent to PHY 541.

**MTH 542. APPLIED MATHEMATICS II (4)**

**MTH 543. INTEGRAL TRANSFORMS I (4)**
PR: MTH 401, 405, or CC. Introduction to integral transforms with special emphasis on the Laplace and Fourier transforms, applications to differential equations.

**MTH 544. INTEGRAL TRANSFORMS II (4)**
PR: MTH 543. Continuation of MTH 543.

**MTH 545. STATISTICAL METHODS IN RESEARCH I (4)**
Primarily for graduate students with research problems. Distribution of sample statistics estimation, tests of hypotheses.

**MTH 546. STATISTICAL METHODS IN RESEARCH II (4)**
PR: MTH 545 or CC. Randomized blocks, Latin squares, factorials, regression, correlation, split plots.

**MTH 548. INTRODUCTORY THEORETICAL STATISTICS (5)**
PR: MTH 305 and either MTH 345 or equivalent. Frequency, sampling, limiting distributions and their moments; theory of point and interval estimation, hypothesis testing, ANOV.

**MTH 549. INTRODUCTORY THEORY OF LEAST SQUARES (5)**
PR: MTH 305 and either MTH 548 or CC. The general linear hypothesis, least squares for experimental design models, components of variance. Applications.

**MTH 553. INTRODUCTION TO GRAPH THEORY (3)**
PR: CC. Brief introduction to classical graph theory (4-color conjecture, etc.), directed graphs, connected digraphs, point bases, condensations, incidence matrices, Polya's Theorem.

**MTH 560. ANALYSIS OF ALGORITHMS I (4)**
PR: MTH 448 or CC. Mathematical Theory associated with algorithms for computer information processing; expected time and space requirements of algorithms, comparison of algorithms, construction of potational algorithms, theory, underlying particular algorithms.

**MTH 561. ANALYSIS OF ALGORITHMS II (4)**
PR: MTH 560. Continuation of MTH 560.

**MTH 563. ANALYSIS OF NUMERICAL METHODS I (4)**

**MTH 564. ANALYSIS OF NUMERICAL METHODS II (4)**
PR: MTH 563. Continuation of MTH 563.

**MTH 571. GEOMETRY FROM AN ADVANCED STANDPOINT (3)**
PR: A bachelor's degree or CC. Axiomatic development of geometries, with emphasis on Euclidean geometry, for teachers and others.

**MTH 573. SET THEORY AND ALGEBRA FROM AN ADVANCED STANDPOINT (3)**
PR: A bachelor's degree or CC. Basic concepts of the language of mathematics, including a study of relations, functions, algebraic structures, for teachers and others.

**MTH 583. SELECTED TOPICS (1-6)**
PR: Senior or junior standing and CC. Each topic is a course of study. 01-History of Mathematics, 03-Logic and Foundations, 05-Number Theory, 07-Topics in Algebra, 09-Mathematics for Physics, 11-Topics in Probability and Statistics, 13-Topics in Analysis, 15-Topics in Topology.
FOR GRADUATE STUDENTS ONLY

MTH 603. THEORY OF ORDINARY DIFFERENTIAL EQUATIONS I (4)
PR: MTH 501 or CC. Existence theorems, topics in oscillation theory, asymptotic behavior, stability and boundedness of solutions of differential equations.

MTH 604. THEORY OF ORDINARY DIFFERENTIAL EQUATIONS II (4)
PR: MTH 603. Continuation of MTH 603.

MTH 614. MODERN ANALYSIS I (4)

MTH 615. MODERN ANALYSIS II (4)
PR: MTH 614. Continuation of MTH 614.

MTH 617. BANACH SPACES AND ALGEBRAS I (4)

MTH 618. BANACH SPACES AND ALGEBRAS II (4)
PR: MTH 617. Continuation of MTH 617.

MTH 624. ABSTRACT ALGEBRA I (4)
PR: CC. Structure theory of fields; ideals and modules.

MTH 625. ABSTRACT ALGEBRA II (4)
PR: MTH 624. Noetherian rings; ideal theory.

MTH 627. HOMOLOGICAL ALGEBRA (3)

MTH 629. LIE GROUPS (3)
PR: MTH 615, 625 or 633 and CC. Topological groups, representation of compact Lie groups, algebraic groups.

MTH 632. ADVANCED TOPOLOGY I (4)
PR MTH 532 and CC. Function spaces, compactifications, covering spaces, other topics.

MTH 633. ADVANCED TOPOLOGY II (4)
PR: MTH 632. Continuation of MTH 632.

MTH 635. ALGEBRAIC TOPOLOGY (3)
PR: MTH 633 or CC. Homotopy, homology groups, local homology groups.

MTH 636. TOPOLOGICAL ALGEBRA I (4)
PR: MTH 633 and CC. Topological semigroups, topological groups, topological rings and fields, Haar measure.

MTH 637. TOPOLOGICAL ALGEBRA II (4)
PR: MTH 636. Continuation of MTH 636.

MTH 639. DIFFERENTIAL GEOMETRY (3)
PR: CC. Local differential geometry, curvature, evolutes and involutes, calculus of variations.

MTH 643. PARTIAL DIFFERENTIAL EQUATIONS I (4)
PR: MTH 401 and CC. Classification of second order equations, Cauchy problems, Dirichlet and Neumann problems, mixed problems, properties of solutions.

MTH 644. PARTIAL DIFFERENTIAL EQUATIONS II (4)
PR: MTH 643. Continuation of MTH 643.

MTH 645. PROBABILITY THEORY (4)

MTH 651. LOGIC AND FOUNDATIONS I (4)
PR: CC. Propositional calculus, Post’s theorem, first order and equality calculi, models, completeness and consistency theorems, Gödel’s theorem, recursive functions.

MTH 652. LOGIC AND FOUNDATIONS II (4)
PR: MTH 651. Continuation of MTH 651.
MTH 657. CALCULUS OF VARIATIONS (4)
PR: MTH 514 and CC. Maxima and minima of functionals, problems of Lagrange, Bolza and Mayer and other topics.

MTH 659. ALGEBRAIC NUMBER THEORY (4)
PR: MTH 524 or CC. Algebraic number fields, algebraic integers, basis and discriminant of algebraic number fields. Ideals, decomposition of ideals, Theorem of Minkowski, Applications of Galois Theory to the Theory of ideals, Units.

MTH 681. GRADUATE RESEARCH (1-15)
PR: CC. (S/U Grade only.)

MTH 683. SELECTED TOPICS (1-6)
PR: CC. 01-Topology, 02-Analysis, 03-Algebra, 04-Applied Mathematics, 05-Graph Theory, 06-Number Theory.

MTH 688. RECENT ADVANCES IN MATHEMATICS WITH EMPHASIS ON THEIR IMPACT ON COLLEGE-LEVEL COURSES (3-6)
A course designed to consider and study the recent developments of mathematics especially those developments that have an effect on altering the basic concepts and ideas of mathematics and imply a change in the presentation of introductory material in the field (Credit not applicable toward thesis degree requirements.) (S/U Grade only.)

MTH 689. DIRECTED RESEARCH (3-9)
Supervision of the teaching of graduate teaching assistants in elementary and/or laboratory courses. (Credit not applicable toward thesis degree requirements.) (S/U Grade only)

MTH 691. GRADUATE SEMINAR (1-6)
Direction of this seminar is by a faculty member. Students are required to present research papers from the literature. (S/U Grade only.)

MTH 699. THESIS (1-9)
May be taken more than once, but not more than a total of nine hours credit will be allowed. (S/U Grade only.)

MEDICINE

MED 600. GROSS ANATOMY (7)
PR: Admission to College of Medicine. A study of the gross structure of the human body. Lec-lab and discussion.

MED 601. DEVELOPMENTAL ANATOMY (EMBRYOLOGY) (2)
PR: Admission to College of Medicine. Studies of the human embryo and fetus with emphasis on teratology. Lec-lab and discussion.

MED 602. MICROSCOPIC ANATOMY (4)
PR: Admission to College of Medicine. A study of the microscopic structure of normal tissues and organs with emphasis on human material. Lec-lab and discussion.

MED 603. NEUROANATOMY (4)
PR: Admission to College of Medicine. A study of the gross and microscopic structure and the functions of the human nervous system. Lec-lab and discussion.

MED 604. ANATOMY SEMINAR (0)
PR: Consent of Chairman, Department of Anatomy. A weekly discussion of anatomical topics of special interest. Lec and discussion.

MED 605. BIOCHEMISTRY (9)
PR: Admission to College of Medicine. A study of the chemistry and metabolism of biologically important compounds. Interrelationship of various metabolic pathways will be discussed with emphasis on the biochemical aspects of human diseases. Lec-lab and discussion.

MED 606. BIOCHEMISTRY SEMINAR (0)
PR: Consent of instructor. Current literature dealing with the biochemical basis of human disease will be discussed. Lec and discussion.

MED 607. MEDICAL MICROBIOLOGY (9)
PR: Admission to College of Medicine. A study of the role of bacteria, viruses,
mycological agents, and parasites as they are related to disease production. Host response to these agents is also an important aspect particularly as related to immune processes. Lec-lab and discussion.

**MED 608. MEDICAL MICROBIOLOGY SEMINAR (0)**
PR: Consent of Chairman, Department of Medical Microbiology. Presentation and discussion of current topics of interest in medical research. Lec and discussion.

**MED 609. PHARMACOLOGY (9)**
PR: Admission to College of Medicine. Studies of pharmacodynamics of drugs including mechanisms of action, side effects, and toxicities. Lec-lab and discussion.

**MED 610. PHARMACOLOGY SEMINAR (0)**
PR: Consent of Chairman, Department of Pharmacology. Presentation of current research investigations as related to medical problems. Lec and discussion.

**MED 611. MEDICAL PHYSIOLOGY (9)**
PR: Admission to College of Medicine. A study of the functional aspects of components of the body and its organ systems and their integration into operational units. The physiology of homeostasis and the central nervous system will be included. Lec-lab and discussion.

**MED 612. PHYSIOLOGY SEMINAR (0)**
PR: Consent of Chairman, Department of Physiology. Seminars in which current research areas of interest as related to medicine are discussed. Lec and discussion.

**MED 613. HUMAN BIOLOGY (7)**
PR: Admission to College of Medicine. An interdisciplinary course emphasizing the relevance of pre-clinical science and the contributions of recent research information to the practice of medicine. Lec and discussion.

**MED 614. BIOSTATISTICS (1)**
PR: Admission to College of Medicine. Presentation of methods of collection, tabulation, graphic illustration, and analysis of numerical data encountered in medical research areas. Lecture.

**MED 615. INTRODUCTION TO PSYCHIATRY (3)**
PR: Admission to College of Medicine. Principles of human behavioral science will be presented from the standpoint of the developing organism reacting to its environment. Lec, patient contact, and discussion.

**MED 616. PSYCHIATRY SEMINAR (0)**
PR: Consent of Chairman, Department of Psychiatry. Current research surveys in Psychiatry. Lec and discussion.

**MED 617. PATHOLOGY (18)**
PR: Admission to College of Medicine. A correlated study of gross and microscopic material illustrating structural and functional changes in cells, tissues, and organs during disease processes. Lec-lab and discussion.

**MED 618. PATHOLOGY SEMINAR (0)**
PR: Consent of Chairman, Department of Pathology. Presentation and discussion of current topics of medical importance in general area of pathology. Lec and discussion.

**MED 619. INTRODUCTION TO MEDICINE (5)**
PR: Admission to College of Medicine. A course designed to provide the student with a comprehensive frame of reference for viewing health and disease as an interplay of biological, social and psychological factors. Lec, patient contact, and discussion.

**MED 620. LABORATORY MEDICINE (9)**
PR: Admission to College of Medicine. Presentation and evaluation of clinical-pathologic correlation between laboratory findings and disease processes. Lec-lab, patient contact, and discussion.

**MED 621. PHYSICAL DIAGNOSIS (7)**
PR: Admission to College of Medicine. The basic techniques of clinical
evaluation are presented emphasizing history taking and the demonstration of normal and abnormal physical findings. Lec, patient contact, and discussion.

**MED 622. BASIC SCIENCE REVIEW (11)**
PR: Admission to College of Medicine. An interdisciplinary course in which basic concepts of each science will be reviewed and additional work involving more advanced and sophisticated concepts will be presented. Lec-lab and discussion.

**MED 623. TUTORIAL CLERKSHIP (9)**
PR: Admission to College of Medicine. The primary objective is to provide for the extension and perfection of work in both physical diagnosis and laboratory medicine. Lec, patient contact, and discussion.

### MODERN LANGUAGES

#### French

*Faculty:* Arzybushev, Braun, Cherry, DeJongh, Glénisson, de la Ménardière, Wall, Whartenby.

For Functional French course descriptions see page 165.

**CBS 111. BEGINNING FRENCH I (5)**

**CBS 112. BEGINNING FRENCH II (5)**

**CBS 211. INTERMEDIATE FRENCH I (4)**
PR: CBS 112.

**CBS 212. INTERMEDIATE FRENCH II (4)**
PR: CBS 211.

For course descriptions of above courses refer to Basic Studies section.

**FRE 203. BEGINNING CONVERSATION (3)**
PR: CBS 113

**FRE 301. CONTROLLED COMPOSITION (4)**
PR: CBS 212

**FRE 303. ADVANCED CONVERSATION (3)**
PR: FRE 203. Free conversation based upon the current French idiom.

**FRE 305. INTRODUCTION TO FRENCH LITERATURE (4)**
PR: CBS 212

**FRE 310. FRENCH CLASSICS IN TRANSLATION (4)**
PR: None. *Song of Roland*, Voltaire, Hugo, Stendhal, Flaubert and others.

**FRE 311. CONTEMPORARY FRENCH LITERATURE IN TRANSLATION (4)**
PR: None. Proust, Gide, Montherlant, Sartre, Camus, Anouilh, Beckett and others.

**FRE 321. FRENCH FOR NON-LINGUISTS (3)**
PR: None. Provides the non-linguist with a limited spoken fluency in French, as well as a mastery of the linguistic structures necessary to pass a reading examination in French.

**FRE 401. EXPOSITORY WRITING (4)**
PR: FRE 301

**FRE 403. PHONETICS AND DICTION (4)**
PR: FRE 303.

**FRE 405. SURVEY OF FRENCH LITERATURE (4)**
PR: FRE 305. Earliest monuments through 18th Century Enlightenment.

**FRE 406. SURVEY OF FRENCH LITERATURE (4)**
PR: 305. Romanticism to present.

**FRE 410. FRENCH CIVILIZATION (4)**
PR: FRE 321 Recommended. France's contribution to world culture and civilization, particularly as such molded and molds the twentieth century.

### FOR SENIOR LEVEL AND GRADUATE STUDENTS

**FRE 501. EARLY RENAISSANCE LITERATURE (4)**
PR: FRE 405. Emphasis on Rabelais and his contemporaries.
FRE 502. LATER RENAISSANCE LITERATURE (4)
   PR: FRE 405. Emphasis on Montaigne and the Pléiade.
FRE 516. STYLISTICS (4)
   PR: FRE 401.
FRE 521. CLASSICAL PROSE AND POETRY (4)
   PR: FRE 405. Emphasis on Malherbe, La Fontaine, Boileau, Descartes, and Pascal.
FRE 522. CLASSICAL DRAMA (4)
   PR: FRE 405. Corneille, Moioliére, and Racine.
FRE 531. THE ENCYCLOPEDISTS (4)
   PR: FRE 405. The Classical tradition and the new currents of thought 1715-50.
FRE 532. ROUSSEAU AND PRE-ROMANTICISM (4)
   PR: FRE 405.
FRE 541. ROMANTICISM (4)
   PR: FRE 406.
FRE 542. 19TH CENTURY REALISM AND PARNASSIANISM (4)
   PR: FRE 406.
FRE 543. LATE 19TH CENTURY LITERATURE (4)
FRE 551. 20TH CENTURY LITERATURE TO 1939 (4)
   PR: FRE 406.
FRE 552. 20TH CENTURY LITERATURE 1939-PRESENT (4)
   PR: FRE 406.
FRE 553. SELECTED TOPICS 1-4)
   PR: Senior or graduate standing. CI.
FRE 585. DIRECTED STUDY (1-4)
   PR: Senior or graduate standing. CI.

FOR GRADUATE STUDENTS ONLY

FRE 601. OLD FRENCH (4)
   PR: FRE 403. NOTE: Required of all M.A. Candidates.
FRE 612. MONTAIGNE (4)
   PR: Graduate standing.
FRE 622. SEMINAR ON CLASSICAL DRAMA (4)
   PR: Graduate standing. A study of the works of Corneille and Racine or the works of Moliére.
FRE 659. BIBLIOGRAPHY (2)
   PR: Graduate standing. Research methods. Includes familiarity with major journals and bibliographies, and a practicum.
   NOTE: Required of all M.A. Candidates.
FRE 691. GRADUATE SEMINAR (4)

German

Faculty: DeVinney, Grothmann, Jochimek, Nagosky, Price, Stelzmann

For Functional German course descriptions see Basic Studies section.

CBS 114. BEGINNING GERMAN I (5)
CBS 115. BEGINNING GERMAN II (5)
CBS 214. INTERMEDIATE GERMAN I (4)
   PR: CBS 116
CBS 215. INTERMEDIATE GERMAN II (4)
   PR: CBS 214
For course descriptions of above courses refer to Basic Studies section.
GER 203. BEGINNING CONVERSATION (3)
   PR: CBS 115.
GER 301. CONTROLLED COMPOSITION (4)
   PR: CBS 215
GER 303. ADVANCED CONVERSATION (3)
PR: GER 203. Free conversation based upon the current German idiom.

GER 305. INTRODUCTION TO GERMAN LITERATURE (4)
PR: CBS 215.

GER 310. GERMAN CLASSICS IN TRANSLATION (4)
PR: None. Goethe, Schiller, Kant, Schopenhauer, Büchner, Novalis and others.

GER 311. CONTEMPORARY GERMAN LITERATURE IN TRANSLATION (4)
PR: None. Mann, Hesse, Kafka, Grass, Boll, Brecht, Weiss and others.

GER 321. GERMAN FOR NON-LINGUISTS (3)
PR: None. Provides the non-linguist with a limited spoken fluency in German, as well as a mastery of the linguistic structures necessary to pass a reading examination in German.

GER 401. EXPOSITORY WRITING (4)
PR: GER 301

GER 405. SURVEY OF GERMAN LITERATURE (4)
PR: GER 305. Earliest monuments to Classicism.

GER 406. SURVEY OF GERMAN LITERATURE (4)
PR: GER 305. Romanticism to the present.

GER 410. GERMAN CIVILIZATION (4)
PR: GER 321 recommended. Germany’s contribution to world culture and civilization, particularly as such molded and molds the twentieth century.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

GER 513. HISTORY OF THE GERMAN LANGUAGE (4)
PR: GER 401.

GER 516. STYLISTICS (4)
PR: GER 401.

GER 521. FAUST I (4)
PR: GER 405.

GER 531. GOETHE (4)
PR: GER 405.

GER 532. SCHILLER (4)
PR: GER 405.

GER 535. THE ENLIGHTENMENT (4)
PR: GER 405.

GER 543. ROMANTICISM (4)
PR: GER 406.

GER 544. REALISM (4)
PR: GER 406.

GER 552. 20TH CENTURY LITERATURE TO 1945 (4)
PR: GER 406.

GER 553. 20TH CENTURY LITERATURE 1945-PRESENT (4)
PR: GER 406.

GER 583. SELECTED TOPICS (1-4)
PR: Senior or graduate standing, CI.

GER 585. DIRECTED STUDY (1-4)
PR: Senior or graduate standing, CI.

FOR GRADUATE STUDENTS ONLY

GER 601. MIDDLE HIGH GERMAN (4)
PR: GER 513

GER 631. FAUST II (4)
PR: GER 521

GER 691. GRADUATE SEMINAR (4)

Italian

Faculty: Artzybushev, Fiore, Ierardo, Milani

For functional Italian course descriptions see Basic Studies section
CBS 123. BEGINNING ITALIAN I (5)
CBS 124. BEGINNING ITALIAN II (5)
CBS 223. INTERMEDIATE ITALIAN I (4)
   PR: CBS 124.
CBS 224. INTERMEDIATE ITALIAN II (4)
   PR: CBS 223
   For course descriptions of above courses refer to Basic Studies section.

ITA 203. BEGINNING CONVERSATION (3)
   PR: CBS 124

ITA 301. CONTROLLED COMPOSITION (4)
   PR: CBS 224

ITA 303. ADVANCED CONVERSATION (3)
   PR: ITA 203. Free conversation based upon the current Italian idiom.

ITA 305. INTRODUCTION TO ITALIAN LITERATURE (4)
   PR: CBS 224

ITA 310. ITALIAN CLASSICS IN TRANSLATION (4)
   PR: None. Dante, Petrarcha, Manzoni, Carducci, Poliziano, Castiglione and others.

ITA 311. CONTEMPORARY ITALIAN LITERATURE IN TRANSLATION (4)

ITA 321. ITALIAN FOR NON-LINGUISTS (3)
   PR: None. Provides the non-linguist with a limited spoken fluency in Italian, as well as a mastery of the linguistic structures necessary to pass a reading examination in Italian.

ITA 401. EXPOSITORY WRITING (4)
   PR: ITA 301.

ITA 405. SURVEY OF ITALIAN LITERATURE (4)
   PR: ITA 305. Earliest monuments to 18th century Classicism.

ITA 406. SURVEY OF ITALIAN LITERATURE (4)
   PR: ITA 305. Romanticism to present.

ITA 410. ITALIAN CIVILIZATION (4)
   PR: ITA 321 recommended. Italy's contribution to world culture and civilization, particularly as such molded and molds the twentieth century.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

ITA 512. DIVINE COMEDY I (4)
   PR: ITA 405

ITA 513. DIVINE COMEDY II (4)
   PR: ITA 405

ITA 541. ROMANTICISM (4)
   PR: ITA 406

ITA 542. REALISM (4)
   PR: ITA 406

ITA 551. 20TH CENTURY LITERATURE TO 1939 (4)
   PR: ITA 406

ITA 552. 20TH CENTURY LITERATURE 1939-PRESENT (4)
   PR: ITA 406

ITA 583. SELECTED TOPICS (1-4)
   PR: Senior or graduate standing. CI.

ITA 585. DIRECTED STUDY (1-4)
   PR: Senior or graduate standing. CI.

Portuguese

Faculty: Capsas, chairman; Lopes, Tatum.

POR 313. BRAZILIAN LITERATURE IN TRANSLATION (4)
   PR: None. Machado de Assis, Graça Aranha, Da Cunha, Monteiro Lobato,
Lins do Rêgo, Ramos, Amado, Guimarães Rosa and others.

**POR 326. BEGINNING ACCELERATED PORTUGUESE** (4)
PR: Two years of another Romance Language or Latin.

**POR 327. INTERMEDIATE ACCELERATED PORTUGUESE** (4)
PR: POR 326.

**POR 401. EXPOSITORY WRITING** (4)
PR: POR 327.

**POR 405. SURVEY OF PORTUGUESE LITERATURE** (4)
PR: POR 327.

**FOR SENIOR LEVEL AND GRADUATE STUDENTS**

**POR 585. DIRECTED STUDY** (1-4)
PR: POR 405. CI.

**Romance**

*Faculty*: DeJongh, Milani, Neugaard

**FOR SENIOR LEVEL AND GRADUATE STUDENTS**

**ROM 517. ROMANCE PHILOLOGY** (4)
PR: Senior or graduate standing.

**ROM 518. MEDIEVAL AND EARLY ROMANCE LITERATURE** (4)
PR: ROM 517.

**Russian**

*Faculty*: Jochimek, Sokolsky

**CBS 117. BEGINNING RUSSIAN I** (5)
**CBS 118. BEGINNING RUSSIAN II** (5)
**CBS 217. INTERMEDIATE RUSSIAN I** (4)
PR: CBS 118.

**CBS 218. INTERMEDIATE RUSSIAN II** (4)
PR: CBS 217.

For course descriptions on above, refer to Basic Studies section.

**RUS 203. BEGINNING CONVERSATION** (3)
PR: CBS 118

**RUS 301. CONTROLLED COMPOSITION** (4)
PR: CBS 218.

**RUS 303. ADVANCED CONVERSATION** (3)
PR: RUS 203. Free conversation based upon the current Russian idiom.

**RUS 305. INTRODUCTION TO RUSSIAN LITERATURE** (4)
PR: CBS 218.

**RUS 310. RUSSIAN CLASSICS IN TRANSLATION** (4)
PR: None. Pushkin, Turgenev, Tolstoy, Dostoyevsky, and others.

**RUS 311. SOVIET LITERATURE IN TRANSLATION** (4)
PR: None. Gorky, Chekhov, Pasternak, Solzhenitsyn, and others.

**RUS 321. RUSSIAN FOR NON-LINGUISTS** (3)
PR: None. Provides the non-linguist with a limited spoken fluency in Russian, as well as a mastery of the linguistic structures necessary to pass a reading examination in Russian.

**RUS 401. EXPOSITORY WRITING** (4)
PR: RUS 301.

**RUS 405. SURVEY OF RUSSIAN LITERATURE** (4)
PR: RUS 305. Earliest monuments to Classicism.

**RUS 406. SURVEY OF RUSSIAN LITERATURE** (4)
PR: RUS 305. Romanticism to present.
RUS 410. SLAVIC CIVILIZATION (4)
PR: RUS 321 recommended. Slavic contribution to world culture and civilization, particularly as such molded and molds the twentieth century.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

RUS 515. HISTORY OF THE RUSSIAN LANGUAGE I (4)
PR: RUS 401.

RUS 516. HISTORY OF THE RUSSIAN LANGUAGE II (4)
PR: RUS 515.

RUS 541. 19TH CENTURY DRAMA (4)
PR: RUS 405.

RUS 552. TOLSTOY (4)
PR: RUS 405.

RUS 553. DOSTOYEVSKY (4)
PR: RUS 405.

RUS 561. CHEKHOV AND GORKY (4)
PR: RUS 406.

RUS 563. SOVIET LITERATURE (4)
PR: RUS 406.

RUS 583. SELECTED TOPICS (1-4)
PR: Senior or graduate standing, CI.

RUS 585. DIRECTED STUDY (1-4)
PR: Senior or graduate standing, CI.

Spanish

Faculty: Cano, Capsas, Hampton, Lopes, Hunter, McLean, Neugaard, Seminario, Sparks, Tatum.

CBS 120. BEGINNING SPANISH I (5)
CBS 121. BEGINNING SPANISH II (5)
CBS 220. INTERMEDIATE SPANISH I (4)
PR: CBS 121.
CBS 221. INTERMEDIATE SPANISH II (4)
PR: CBS 220.

For course descriptions of above courses refer to Basic Studies section.

SPA 203. BEGINNING CONVERSATION (3)
PR: CBS 121.

SPA 301. CONTROLLED COMPOSITION (4)
PR: CBS 221.

SPA 303. ADVANCED CONVERSATION (3)
PR: SPA 203. Free conversation based upon the current Spanish idiom.

SPA 305. INTRODUCTION TO HISPANIC LITERATURE (4)
PR: CBS 221.

SPA 310. SPANISH CLASSICS IN TRANSLATION (4)
PR: None. The Cid, The Celestina, Lope de Vega, Cervantes, Quevedo, Pérez Galdós, and others.

SPA 311. CONTEMPORARY SPANISH LITERATURE IN TRANSLATION (4)
PR: None. Pio Baroja, Azorín, Unamuno, Valle-Inclán, Sender, Jiménez, Cela and others.

SPA 313. SPANISH AMERICAN LITERATURE IN TRANSLATION (4)
PR: None. Dario, Mistral, Güiraldes, Azuela, Borges, Asturias, Carpentier and others.

SPA 321. SPANISH FOR NON-LINGUISTS (3)
PR: None. Provides the non-linguist with a limited spoken fluency in Spanish as well as a mastery of the linguistic structures necessary to pass a reading examination in Spanish.

SPA 401. EXPOSITORY WRITING (4)
PR: SPA 301.
SPA 403. PHONETICS AND PHONOLOGY (4)  
PR: SPA 303.

SPA 405. SURVEY OF SPANISH LITERATURE (4)  
PR: SPA 305. Earliest monuments to 18th Century Neo-Classicism.

SPA 406. SURVEY OF SPANISH LITERATURE (4)  
PR: SPA 305. Romanticism to the present.

SPA 410. HISPANIC CIVILIZATION (4)  
PR: SPA 321 recommended. Spain's contribution to world culture and civilization, particularly as such molded and molds the twentieth century.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

SPA 516. STYLISTICS (4)  
PR: SPA 401.

SPA 524. GOLDEN AGE DRAMA (4)  
PR: SPA 405. Lope de Vega, Alarcón, Tirso, Calderón and others.

SPA 525. GOLDEN AGE NON-DRAMATIC LITERATURE (4)  
PR: SPA 405. Emphasis on lyric poetry and the mystics.

SPA 526. THE QUIXOTE (4)  
PR: SPA 405.

SPA 540. ROMANTICISM (4)  
PR: SPA 406.

SPA 542. 19TH CENTURY REALISM (4)  
PR: SPA 406.

SPA 546. THE GENERATION OF 1898 (4)  
PR: SPA 406.

SPA 552. 20TH CENTURY LITERATURE 1936-PRESENT (4)  
PR: SPA 406.

SPA 561. SURVEY OF SPANISH AMERICAN LITERATURE I (4)  
PR: SPA 406.

SPA 562. SURVEY OF SPANISH AMERICAN LITERATURE II (4)  
PR: SPA 406.

SPA 570. MEXICAN LITERATURE (4)  
PR: SPA 561, 562.

SPA 575. RIVER PLATE LITERATURE (4)  
PR: SPA 561, 562.

SPA 583. SELECTED TOPICS (1-4)  
PR: Senior or graduate standing. CI.

SPA 585. DIRECTED STUDY (1-4)  
PR: Senior or graduate standing. CI.

FOR GRADUATE STUDENTS ONLY

SPA 601. OLD SPANISH (4)  
PR: SPA 403. Note: Required of all M.A. candidates.

SPA 624. SEMINAR ON GOLDEN AGE DRAMA (4)  
PR: SPA 524.

SPA 625. THE PICARESQUE NOVEL (4)  
PR: SPA 525.

SPA 689. BIBLIOGRAPHY (2)  
PR: Graduate standing. Research methods. Includes familiarity with major journals and bibliographies, and a practicum.

NOTE: Required of all M.A. Candidates.

SPA 691. GRADUATE SEMINAR (4)

MUSIC ARTS

Faculty: Sperry, chairman; J. Abram, E.S. Anderson, Apple, Bridges, N.R. Cooke, Dickey, Enix, Eubank, Fearn, Gee, L.A. Golding, A.L. Hawkins, Henning, Jen-

**MUS 101. RUDIMENTS OF MUSIC (3)**
Preparatory course for music majors who do not qualify for MUS 201; development of skills in hearing and performing music and in basic notation.

**MUS 201-202-203. MUSICAL STYLES (3,3,3)**
Required of music majors; aural and visual analysis of musical styles from Antiquity to 1600; stylistic composition for voices; counterpoint; form; development of related skills in music reading and keyboard facility.

**MUS 204. PERFORMANCE (2)**
Required of music majors; performance instruction in string, woodwind, brass, and percussion instruments; composition, voice, and piano; private and class lessons coordinated with laboratory experience in one assigned performing organization; or, for composition majors, secondary instrument instruction; may be repeated for credit.

Sec 001 Violin  Sec 006 Oboe  Sec 011 Trombone/Baritone
002 Viola  007 Clarinet/Saxophone  012 Tuba
003 Violoncello  008 Bassoon  013 Percussion
004 String Bass  009 French Horn  014 Composition
005 Flute  010 Trumpet  015-019 Voice
  020-030 Piano

**MUS 301-302-303. MUSICAL STYLES (3,3,3)**
PR: MUS 203. Required of music majors; continuation of MUS 201-203; musical styles from 1600 to 1827; harmony; instrumentation; form; stylistic composition for various media; continued development of related skills.

**MUS 304. PERFORMANCE (3)**
PR: Necessary competency at MUS 204 level determined by faculty jury. Required of music majors; performance instruction in string, woodwind, brass, and percussion instruments, composition, voice, and piano; private and class lessons coordinated with laboratory experience in one assigned major performing organization and one chamber music ensemble. Composition majors may be advised to take instruction on a secondary instrument instead of either or both ensembles. May be repeated for credit.

Sec 001 Violin  Sec 006 Oboe
002 Viola  007 Clarinet/Saxophone  011 Trombone/Baritone  012 Tuba
003 Violoncello  008 Bassoon  013 Percussion
004 String Bass  009 French Horn  014 Composition
005 Flute  010 Trumpet  015-019 Voice
  020-024 Piano

**MUS 371. ISSUES IN MUSIC (2)**
Open only to non-music majors; lectures and live performances by artist faculty of significant works from the literature for the piano; analysis and illustration in performance of the abstract and aesthetic elements in music which vitally concern the artist-performer; credit awarded on pass-fail basis.

**MUS 372-373. THE ENJOYMENT OF MUSIC (3,3)**
Open only to non-music majors; a study of the art of music and its materials, designed to develop an understanding of basic principles of music and a technique for listening to music; Section 001 of MUS 372 is for students who are majoring in dance, theatre arts, and visual arts.

**MUS 374. MAJOR PERFORMING ORGANIZATIONS (1)**
Open only to non-music majors with the necessary proficiency in their performance media; study and performance of music for large combinations of string, wood-
winds, brass, or percussion instruments, and voices; may be repeated for credit; credit awarded on pass-fail basis.

Sec 001 Concert Band I
Sec 006 University-Community Chorus
002 Concert Band II 007 Opera Workshop
003 Reading Band 008 Symphony Orchestra
004 University Choir 009 Reading Chorus
005 Reading Chorus

MUS 375. CHAMBER MUSIC ENSEMBLES (1)
Open only to non-music majors with the necessary proficiency in their performance media; study and performance of music for small combinations of string, woodwind, brass, or percussion instruments, voice, and piano; may be repeated for credit; credit awarded on pass-fail basis.

Sec 001 Chamber Singers
002 Jazz Laboratory Band
003 Brass Choir
004 Brass Quintet
005 Woodwind Quintet
006 Piano Ensemble
007 String Quartet
Sec 008 French Horn Quartet
Sec 009 Clarinet Choir
010 Percussion Ensemble
011 Marimba Ensemble
012 Flute Choir
013 New Music Ensemble

MUS 401-402-403. MUSICAL STYLES (2,2,2)
PR: MUS 303. Required of music majors; continuation of MUS 201-303; musical styles from 1828 to the present.

MUS 404. PERFORMANCE (3)
PR: Necessary competency at MUS 304 level determined by faculty jury. Required of music majors; continued performance instruction in string, woodwind, brass, and percussion instruments, composition, voice, and piano; private and class lessons coordinated with laboratory experience in one assigned major performing organization and one chamber music ensemble. Composition majors may be advised to take instruction on a secondary instrument instead of either or both ensembles. May be repeated for credit.

Sec 001 Violin
002 Viola
003 Violoncello
004 String Bass
005 Flute
Sec 006 Oboe
007 Clarinet/Saxophone
008 Bassoon
009 French Horn
010 Trumpet
Sec 011 Trombone/Baritone
012 Tuba
013 Percussion
014 Composition
015-019 Voice
020-024 Piano

MUS 481. DIRECTED STUDY (1-6)
PR: CC. Independent studies in the various areas of music; course of study and credits must be assigned prior to registration; may be repeated.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

MUS 501-502-503. MUSICAL STYLES (3,3,3)
PR: CI. Advanced problems in analysis of music of various styles; emphasis on Medieval, Romantic, and Contemporary music.

MUS 504. PERFORMANCE (3)
PR: Necessary competency at MUS 404 level determined by faculty jury. Required of music majors; continued performance instruction in string, woodwind, brass, and percussion instruments, composition, voice, and piano; private and class lessons coordinated with laboratory experience in one assigned major performing organization and one chamber music ensemble; composition majors may be advised to take instruction on a secondary instrument instead of either or both ensembles. May be repeated for credit.

Sec 001 Violin
002 Viola
003 Violoncello
004 String Bass
005 Flute
Sec 006 Oboe
007 Clarinet/Saxophone
008 Bassoon
009 French Horn
010 Trumpet
Sec 011 Trombone/Baritone
012 Tuba
013 Percussion
014 Composition
015-019 Voice
020-024 Piano
MUS 505. STUDIO TEACHING (3)
PR: CI. Required of undergraduate music arts majors; emphasis on the business management of the music studio, the musical responsibilities of the studio teacher, the techniques of private instruction.

MUS 506. ELECTRONIC MUSIC SEMINAR (3)
PR: CI. Emphasis on the proper use of electronic instruments, construction of simpler instruments, study of the literature and music of the field.

MUS 507-508. ORCHESTRATION (3,3)
PR: CI. Intensive study and practice in scoring music for various combinations of instruments including symphony orchestra, band, and smaller ensembles of string, woodwind, brass, and percussion instruments.

MUS 561. MASTER CLASSES (2)
PR: CI. Study and performance of selected literature with special emphasis on style, form, and technique; especially designed for teachers, piano majors, and talented secondary school students.

MUS 562. MUSIC WORKSHOPS (2)
PR: CI. Intensive study in the specialized areas indicated below; open to teachers, University students, and secondary students; credit available to qualified students.

MUS 581. DIRECTED STUDY (1-6)
PR: CC. Independent studies in the various areas of music; course of study and credits must be assigned prior to registration; may be repeated.

FOR GRADUATE STUDENTS ONLY

MUS 601-602-603. EVOLUTION OF MUSICAL STYLES (3,3,3)
Required of music theory majors; study of the development of musical styles in Western civilization from Antiquity to the present; includes analysis and performance of representative works.

MUS 605. STUDIO TEACHING SEMINAR (3)
PR: Graduate standing in performance and CI; emphasis on techniques used in teaching the individual student in performance.

MUS 606-607-608. TEACHING OF MUSIC THEORY (4,4,4)
Comparative study of teaching techniques, procedures, and materials used in music theory curricula.

MUS 611-612. ACOUSTICS (4,4)
Required of music theory majors; study of the nature and transmission of sound, the hearing process, tuning, and temperament; includes principles of electronic sound reproducers and basic concepts of architectural acoustics.

MUS 621. SYMPHONIC LITERATURE (5)
A chronological study of the development of orchestral music; analysis and study of major works from a stylistic and biographical perspective.

MUS 622. MASTERWORKS OF CHORAL LITERATURE (5)
A chronological study of the development of choral music; analysis and study of major works from a stylistic and biographical perspective.

MUS 623. TWENTIETH CENTURY MUSIC (5)
PR: CI. A study of the compositional techniques of composers from Debussy to the present; emphasis on counterpoint, harmonic structure, tonality, atonality, polytonality, texture, and serial technique.

MUS 624-625-626. KEYBOARD LITERATURE (3,3,3)
A chronological study of the development of music for the keyboard instruments; analysis and study of major works from a stylistic and biographical perspective.

MUS 627-628-629. SONG LITERATURE (3,3,3)
Solo song literature from the 17th century through the contemporary with emphasis on German lieder, oratorio, and opera; special emphasis on performance.
MUS 631-632. OPERA LITERATURE (4,4)
A chronological study of the development of opera from 1600 to the present; emphasis on the technical, stylistic, and performance aspects of opera.

MUS 633-634-635. CHORAL LITERATURE AND CONDUCTING (6,6,6)
Combination of seminar, classroom, and laboratory types of experiences designed to provide depth in stylistic study of choral music literature and performance.

MUS 636-637. INSTRUMENTAL CONDUCTING (3,3)
PR: CI. Intensive study of instrumental conducting techniques with emphasis on interpretation of musical scores and application in laboratory sessions.

MUS 641. ENSEMBLE (1)
PR: CI. Study and performance of music for various combinations of string, woodwind, brass, and percussion instruments, voice, and piano; may be repeated four times for credit.

GRADUATE PERFORMANCE INSTRUCTION
Courses preceded by an asterisk (*)

In order to enroll at this level for four credits, performance majors must qualify by audition. Candidates for the master of arts degree may be permitted to enroll for two credits at a lower level of proficiency in order to study performance techniques on their major instrument or one of secondary importance.

MUS 642. *STRING INSTRUMENTS (2,4)
PR: CC. Sec 002, 004, Violin; Sec 102, 104, Viola; Sec 202, 204 Violoncello; Sec 302, 304 Bass.

MUS 643. *WOODWIND INSTRUMENTS (2,4)
PR: CC. Sec 002, 004 Flute; Sec 102, 104 Oboe; Sec 202, 204 Clarinet/Saxophone; Sec 302, 304 Bassoon.

MUS 644. *BRASS INSTRUMENTS (2,4)
PR: CC. Sec 002, 004 Trumpet; Sec 102, 104 French Horn; Sec 202, 204 Low Brass.

MUS 645. *PERCUSSION INSTRUMENTS (2,4)
PR: CC.

MUS 646. *COMPOSITION (4)
PR: CC. Original composition in varied forms; emphasis on analysis and application of contemporary techniques and styles; may be repeated to a maximum of twelve credits.

MUS 647. *VOICE (2,4)
PR: CC.

MUS 648. *PIANO (2,4)
PR: CC.

MUS 681. DIRECTED STUDY (1-9)
PR: CC. Independent graduate studies in the various areas of music; course of study and credits must be assigned prior to registration; may be repeated.

MUS 691. GRADUATE SEMINAR (2)
PR: CC. May be repeated to a maximum of six credits.

MUS 698. GRADUATE RECITAL (3)
PR: CC.

MUS 699. GRADUATE THESIS (3)
PR: CC. May be repeated to a maximum of nine credits.

OCEANOGRAPHY
See MARINE SCIENCE

OFF-CAMPUS TERM

Faculty: Lupton, coordinator; and staff.
OCT 401. COMMUNITY INTERACTION (5)
A field course for students in the OCT Program utilizing the community as a learning laboratory to develop sensitivity to the problems of our society.

OCT 410. OFF CAMPUS TERM SOCIAL ACTION PROJECT (1 or 2)
OCT 411. OFF CAMPUS TERM INDEPENDENT STUDY (1 or 2)
OCT 412. OFF CAMPUS TERM INTERNATIONAL PROGRAM (1 or 2)
OCT 413. OFF CAMPUS TERM WORK EXPERIENCE (1 or 2)
OCT 414. OFF CAMPUS TERM SPECIAL PROJECT (1 or 2)
The above courses are provided for students admitted in the Off-Campus Term Program to work on one of the types of projects indicated above.

PHILOSOPHY

Faculty: Gould, chairman; Carpenter, Carrier, Chen, Krimsky, Taylor, Truitt.

PHI 111. GREAT PHILOSOPHERS OF THE WESTERN WORLD (2)
Lectures and discussion of the great philosophers since Plato, focusing on particular problems.

PHI 301. BASIC PHILOSOPHY I: GOD AND REALITY (4)
An introduction to the major philosophical problems in religion, metaphysics, and the philosophy of mind.

PHI 303. LOGIC (5)
Language analysis and classical and modern formal logic, including the logic of classes and propositions, and discussion of philosophical issues.

PHI 304. SCIENTIFIC METHOD (4)
Probability, inductive inference, the hypothetico-deductive method, experiment-ation, and selected topics in the philosophy of science.

PHI 311. BASIC PHILOSOPHY II: VALUE AND SOCIETY (4)
PR: none. An introduction to the major philosophical problems in ethics, aesthetics, and social political philosophy.

PHI 317. BASIC PHILOSOPHY III: KNOWLEDGE AND SCIENCE (4)
PR: none. An introduction to the major philosophical problems in methodology, epistemology, and the philosophy of science.

PHI 321. ETHICS (4)
An examination of the writing of the philosophers: Plato, Aristotle, Kant, Sartre, etc. about moral problems and principles.

PHI 333. ANCIENT AND MEDIEVAL PHILOSOPHY (4)
A survey of philosophy from Thales through the medieval writers.

PHI 334. RENAISSANCE AND MODERN PHILOSOPHY (4)
A survey of philosophy from the Renaissance through Kant.

PHI 335. RECENT PHILOSOPHY (4)
A survey of philosophy from Kant through 19th century philosophy.

PHI 377. SOCIAL PHILOSOPHY (4)
An analysis of rival theories of social order and their philosophical foundations.

PHI 381. DIRECTED STUDY (1-5)
PR: CI. Individual study directed by a faculty member. Approval slip from instructor required.

PHI 383. SELECTED TOPICS (1-5)
PR: CI. Selected topics according to the needs of the student. Approval slip from instructor required.

PHI 405. CONTEMPORARY PHILOSOPHY (4)
PR: 12 hours or CI. Selected schools of 20th century thought such as idealism, positivism, pragmatism, realism, and existentialism.

PHI 406. ANALYTICAL PHILOSOPHY (4)
PR: 12 hours, PHI 303. A study of the method devoted to clarifying philosophical problems through analysis of the language in which these problems are stated.
PHI 407. EXISTENTIALISM (4)
PR: 12 hours or CI. A study of the religious and atheistic existentialists and the bearing of their views on religion, ethics, metaphysics, and theory of knowledge.

PHI 408. CURRENT PHILOSOPHICAL MATERIALISM (4)
PR: CI. A critical study of historical, dialectical, and scientific materialism and its importance in physical science, social science, theory of history, theory of knowledge, and metaphysics.

PHI 411. PHILOSOPHY OF RELIGION (4)
Analysis of religious experience and activity and examination of principal religious ideas in light of modern philosophy.

PHI 413. AMERICAN PHILOSOPHY (4)
Major traditions in American thought—Puritanism, the Enlightenment, Transcendentalism, Idealism, Pragmatism, and Analytic Philosophy—in relation to American culture.

PHI 415. PLATO AND ARISTOTLE (4)
PR: 8 hours or CI. A study of the two great Greek philosophers. The examination of Plato will include the dialogues Protagoras, Gorgias, Meno, Republic; while the readings in Aristotle will be taken from the Nicomachean Ethics and the Politics.

PHI 425. KANT (4)
PR: 8 hours or CI. Lectures and discussions of Kant’s philosophy, especially The Critique of Pure Reason.

PHI 453. EPISTEMOLOGY (4)
PR: 8 hours, PHI 301, or CI. An examination of human knowledge, its scope and limits, and an evaluation of evidence, criteria of truth, the nature of belief, conditions for meaningfulness, theories of perception and a study of memory and sense perception in the four major fields of nature, history, personal experience and the a priori.

PHI 461. ANCIENT AND MEDIEVAL POLITICAL PHILOSOPHY (3)
A survey of political philosophy from 6 B.C. until 1600 A.D., including an examination of the ethical, metaphysical, and epistemological bases of these philosophies.

PHI 463. MODERN POLITICAL PHILOSOPHY (3)
A survey of political philosophy from 1600 A.D. until 1900 A.D., including an examination of the ethical, metaphysical, and epistemological bases of these philosophies.

PHI 465. CONTEMPORARY POLITICAL PHILOSOPHY (3)
A survey of political philosophy in the 20th century, including an examination of the ethical, metaphysical, and epistemological bases of these philosophies.

PHI 481. DIRECTED STUDY (1-5)
PR: CI. Individual study directed by a faculty member. Approval slip from instructor required.

PHI 483. SELECTED TOPICS (1-5)
PR: CI. Selected topics according to the needs of the senior students. Approval slip from instructor required.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

PHI 507. PHILOSOPHY OF SCIENCE (4)
PR: 8 hours or CI. The nature and functions of science; the logic of scientific method; clarification of such concepts as cause, law, theory, probability, determinism, simplicity, technology.

PHI 509. SYMBOLIC LOGIC (4)
PR: PHI 303 or CI. Mathematical treatment of formal logic, including methods of proof, quantification, the logic of relations, and an introduction to properties of deductive systems.

PHI 511. PHILOSOPHY OF LAW (4)
PR: 8 hours or CI. A survey of contemporary philosophical problems in religion such as demythologizing, falsification, and the meaning and justification of key concepts and institutions.
PHI 521. CONTEMPORARY CONTROVERSIES IN PHILOSOPHY OF RELIGION (4)
PR: PHI 411 or CI. The nature and function of law, relations between law, morality and metaphysics, logic of legal reasoning, analysis of fundamental concepts, e.g. God, immortality, faith, etc.

PHI 522. AESTHETICS (4)
Consideration of the traditional problems of aesthetics from more contemporary perspectives including structural analysis, problems in historical analysis, the sociology of art and the psychology of art. Students are urged to also take FNA 543 Comparative Arts/Issues in Creativity as an elective. The combination of these two courses is a desirable approach to knowledge.

PHI 531. PHILOSOPHY OF LANGUAGE (4)
PR: 8 hours of philosophy, major in linguistics or CI. An examination of semantical, syntactical and functional theories of language with special attention given to the problems of meaning, linguistic reference, syntactical form and the relation between scientific languages and ordinary linguistic usage.

PHI 543. PHILOSOPHY OF HISTORY (4)
PR: 8 hours of philosophy, major in history or CI. A systematic study of historical theories and of the methods of historical explanation. An examination of classical theories from Vico through Herder, Hegel, Marx down to Spengler and Toynbee, etc.

PHI 571. SEMINAR IN EPISTEMOLOGY I (3)
PR: Major in philosophy or psychology and CI.

PHI 572. SEMINAR IN EPISTEMOLOGY II (3)
PR: Major in philosophy, or social science and CI.

PHI 573. SEMINAR IN METAPHYSICS I (3)
PR: Major in philosophy or CI. A consideration of the theory of reality.

PHI 574. SEMINAR IN METAPHYSICS II (3)
PR: Major in philosophy or CI. Cosmology.

PHI 575. SEMINAR IN CONTEMPORARY ETHICS (3)
PR: CI. A study of the central figures and doctrines in Contemporary Ethics.

PHI 581. DIRECTED STUDY (1-5)
PR: CI. Individual study directed by a faculty member. Approval slip from instructor required.

PHI 583. SELECTED TOPICS (1-5)
PR: CI. Selected topics according to the needs of the student. Approval slip from instructor required.

PHI 585. RESEARCH (1-5)
PR: CI. Individual research supervised by a faculty member. Approval slip from instructor required.

PHI 591. SEMINAR IN THE HISTORY OF PHILOSOPHY (3)
PR: CI. A study of one or more of the central figures or movements in the History of Philosophy.

PHYSICAL EDUCATION - Basic


Abbreviations: (C) coeducational; (M) men; (W) women.

PEB 101-102. FUNCTIONAL PHYSICAL EDUCATION (1,1)
The first two required courses combine lecture and laboratory experiences which present the need and case for regular physical activity. Each course counts one (1) credit hour and is included in the student’s GPR.

PEB 111-254. ACTIVITY COURSES. (1 each course)
For those pursuing the Physical Education requirement; PEB 230 is a required
course and can be satisfied by course work or credit by examination. The fourth required course is elective. Coursess taken past or outside the requirement are encouraged and count as elective hours. Each course carries one (1) hour credit, is graded S or U and does not affect the CPR.

111 SOFTBALL AND VOLLEYBALL (M) (W)
131 WATER SAFETY INSTRUCTION (C)
133 CANOEING AND SAILING (C)
151 ARCHERY (C)
153 BADMINTON (C)
161 FOLK AND SQUARE DANCE (C)
163 SOCIAL DANCE (C)
171 FENCING (C)
173 GOLF (C)
175 GYMNASTICS (C)
179 TENNIS (C)
200 SPECIAL CONDITIONING (M) (W)
210 BASKETBALL AND VOLLEYBALL (M) (W)
212 FIELD HOCKEY AND TRACK & FIELD (W)
214 SOCCER AND SPEEDBALL (M) (W)
230 BEGINNING SWIMMING (C)
232 INTERMEDIATE SWIMMING (C)
234 ADVANCED SWIMMING (C)
236 LIFE SAVING (C)
238 SCUBA DIVING (C)
240 SYNCHRONIZED SWIMMING (C)
250 HANDBALL AND PADDLEBALL (C)
252 WEIGHT TRAINING (M) (W)
254 WRESTLING (M)

PHYSICS

Faculty: Oleson, chairman; Aubel, Bloch, Brooker, Clapp, Deans, Flynn, Forman, Jones, Kendall, R. Mitchell, Turbeville.

PHY 201-202. GENERAL PHYSICS (4:1)
First quarter of general physics (mechanics) and lab for science students. Must be taken concurrently.

PHY 203-204. GENERAL PHYSICS (4:1)
PR: PHY 201-202. Second quarter of general physics (heat, electricity) and lab for science students. Must be taken concurrently.

PHY 205-206. GENERAL PHYSICS (4:1)
PR: PHY 201-202. Third quarter of general physics (wave motion, optics, atomic and nuclear physics) and lab for science students. Must be taken concurrently.

PHY 301-302. GENERAL PHYSICS AND LABORATORY (3:1)
PR: MTH 302. First quarter of general physics and lab for physics majors and engineering majors. (Must be taken concurrently.) Vectors, kinematics, Newton’s laws, energy, momentum and rigid body motion.

PHY 303-304. GENERAL PHYSICS AND LABORATORY (3:1)

PHY 305-306. GENERAL PHYSICS AND LABORATORY (3:1)
PHY 307. MECHANICS I (3)

PHY 309. ELECTRICITY AND MAGNETISM I (4)

PHY 315. MATHEMATICAL ANALYSIS OF PROBLEMS IN MECHANICS AND ELECTRICITY (3)
PR: One year of non-calculus general physics. CR: MTH 305. Designed for students who have not had the general physics sequence using calculus. Review of mechanics and electricity emphasizing problems which involve the use of calculus.

PHY 323. MODERN PHYSICS (4)

PHY 331. OPTICS (4)
PR: PHY 305 or PHY 315. CR: MTH 304. Reflection, refraction, dispersion, interference diffraction, polarization and laboratory.

PHY 341. INTERMEDIATE LABORATORY (2)
CR: PHY 215 or 305 or equivalent. Experiments in modern physics, including the area of atomic, nuclear, solid state and wave phenomena.

PHY 371. CONTEMPORARY PHYSICS (5)
PR: Junior Standing. A qualitative, non-mathematical investigation of physics, emphasizing its influence on life today. (Not for physics majors)

PHY 405. STATISTICAL PHYSICS I (3)
PR: MTH 305 and either PR: PHY 305 or CR: PHY 315. Statistical approach to thermodynamics and kinetic theory and introduction to statistical mechanics. First quarter of the sequence PHY 405-505.

PHY 407. MECHANICS II (3)

PHY 409. ELECTRICITY AND MAGNETISM II (3)

PHY 415. FUNDAMENTAL ACOUSTICS (4)

PHY 421. SOLID STATE PHYSICS I (4)

PHY 437. QUANTUM MECHANICS I (3)
PR: PHY 407, MTH 402 or CI. Wave-particle duality, uncertainty principle, Schrödinger's equation, postulates, angular momentum, and central forces. First quarter of sequence PHY 437-537.

PHY 441. ADVANCED LABORATORY (2)
PR: PHY 341. Experimental work primarily related to nuclear physics. Emphasis on modern physical experimental techniques employing some of the new types of equipment.
PHY 481. UNDERGRADUATE RESEARCH (1-6)
PR: Senior or advanced junior standing and CC. Individual experimental work under supervision of instructor. (S/U grade only.)

PHY 491. PHYSICS SEMINAR (1)
PR: Senior or advanced junior standing or CC. May be repeated once. (S/U grade only.)

FOR SENIOR LEVEL AND GRADUATE STUDENTS

PHY 501. NUCLEAR PHYSICS (4)
PR: PHY 437 or CI. Systematics of stable nuclides, nuclear forces, nuclear models, reactions, radiation, and nuclear instrumentation.

PHY 505. STATISTICAL PHYSICS II (3)
PR: PHY 405. Continuation of the sequence PHY 405-505.

PHY 507. MECHANICS III (3)
PR: PHY 407. Continuation of PHY 407. Elastic media, the wave equation, transverse and longitudinal wave motion, the diffusion equation, boundary value problems and Fourier series, Fourier integral, fluid dynamics.

PHY 509. ELECTRICITY AND MAGNETISM III (3)

PHY 517. INTRODUCTION TO PLASMA PHYSICS (4)
PR: PHY 509 or CI. Introduction to Boltzmann, magnetohydrodynamic and orbit approaches to plasmas. Longitudinal and electromagnetic waves in plasmas. Collisions and radiation. Instabilities.

PHY 521. SOLID STATE PHYSICS II (3)

PHY 523. ELECTRONICS (4)
PR: PHY 409 and PHY 341. Vacuum and gas-discharge tubes, semiconductors, transistors, electronic circuit analysis and laboratory.

PHY 537. QUANTUM MECHANICS II (3)
PR: PHY 437 or CI. Matrix mechanics, approximation methods, transformations, scattering and identical particles.

PHY 541. METHODS OF THEORETICAL PHYSICS I (4)
PR: MTH 401 or CI. Elements of complex analysis, Laplace transforms, Fourier series, and Fourier transforms. Mathematical techniques for scientists and engineers. Equivalent to MTH 541.

PHY 542. METHODS OF THEORETICAL PHYSICS II (4)

PHY 553. SELECTED TOPICS IN PHYSICS (1-6)
PR: Senior or advanced standing and CC. Each topic is a course in directed study under the supervision of a faculty member. Among the courses contemplated are Physics of Waves, Space Physics, Elementary Particle Physics, Relativity, Nuclear Structure.

FOR GRADUATE STUDENTS ONLY

PHY 601. ATOMIC AND MOLECULAR SPECTRA (4)
PR: PHY 437 or CI. Quantitative study of atomic and molecular structure and spectra.

PHY 605. STATISTICAL MECHANICS (4)
PR: PHY 505 or CI. Kinetic theory, configuration and phase space, Boltzmann theorem, Liouville theorem, ensemble theory, quantum statistics.

PHY 607. CLASSICAL MECHANICS I (3)
PR: PHY 507 or CI. Dynamics of particles and systems of particles, variational
techniques, Lagrange's equations, central forces. First quarter of sequence
PHY 607-608-609.

PHY 608 CLASSICAL MECHANICS II (3)
PR: PHY 607 or CI. Rigid body dynamics, tensors and dyadics, special relativity,
Lorentz transformation, covariance, Hamilton's equations, least action principle.
Second quarter of sequence PHY 607-608-609.

PHY 609. CLASSICAL MECHANICS III (3)
PR: PHY 608. Canonical transformations, Lagrange and Poisson brackets, Liou-
ville's theorem, Hamilton-Jacobi theory, connection between classical and quan-
tum mechanics, small oscillation theory, Hamiltonian and Lagrangian formulations
for fields.

PHY 631. ELECTROMAGNETIC THEORY I (3)
PR: PHY 509 or CI. Electrostatics, magnetostatics, potential and boundary value

PHY 632. ELECTROMAGNETIC THEORY II (3)
PR: PHY 631 or CI. Electromagnetic waves, wave guides and resonant cavities,
diffraction, relativistic-particle kinematics and dynamics, plasmas and magneto-
hydrodynamics.

PHY 633. ELECTROMAGNETIC THEORY III (3)
PR: PHY 632 or CI. Scattering, radiation, multipole fields, radiation damping,
and self-fields.

PHY 637. QUANTUM MECHANICS III (3)
PR: PHY 632 or CI. Dirac equation, quantized fields, collision theory, symmetry
and invariance.

PHY 641. EXPERIMENTAL PHYSICS (2)
PR: Graduate standing. Laboratory techniques frequently required in experi-
mental research. Includes manipulation of glass, production and measurement of
vacua, production and measurement of thin films, and use of various
machine tools.

PHY 681. GRADUATE RESEARCH (1-15)
PR: CC. (S/U grade only.)

PHY 683. SELECTED TOPICS IN PHYSICS (1-15)
PR: CC. Each topic is a course in directed study under the supervision of a
faculty member.

PHY 688. RECENT ADVANCES IN PHYSICS WITH EMPHASIS ON THEIR
IMPACT ON COLLEGE-LEVEL COURSES (3-6)
PR: Graduate Standing. A course designed to consider and study the recent
developments in the field of physics 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 physics. (S/U grade only). (Credit not
applicable toward thesis degree requirements).

PHY 689. DIRECTED TEACHING (3-9)
PR: Graduate Standing. Supervision of the teaching of graduate teaching
assistants in elementary and/or laboratory courses. (S/U grade only)
(Credit not applicable toward thesis degree requirements).

PHY 691. GRADUATE SEMINAR (1)
(S/U grade only.)

PHY 699. MASTER'S THESIS (1-9)
PR: PHY 641. (S/U grade only.)

POLITICAL SCIENCE

Faculty: M. O'Donnell, chairman; Barber, E. Black, Horrigan, Jreisat, A. Kelley,
Laughlin, Levy, Rosner, Sidor, Snook, Stoudinger.

POL 199. INTRODUCTION TO POLITICAL SCIENCE (4)
A survey of the basic concepts in government and politics, theories and methods of
political science and the American political system as well as materials.
POL 201. AMERICAN NATIONAL GOVERNMENT (4)
Basic principles and procedures of the American governmental system with emphasis on current issues and trends.

POL 203. STATE AND LOCAL GOVERNMENT (4)
Analysis of the structure and function of state and local governments, of the social and political influences that shape them, and of the dynamics of their administrative processes.

POL 311. COMPARATIVE POLITICS (4)
Analysis of political systems using the concepts and methods of comparative politics. Studies of selected countries will be included.

POL 331. INTERNATIONAL RELATIONS (4)
Contemporary international affairs, including analysis of politics among nations; control of national foreign policies, sovereignty, nationalism and diplomacy; technology, public opinion and war in international relations.

POL 333. INTERNATIONAL ORGANIZATION (4)
The problems of achieving peace through existing international structures, both within and outside the United Nations. The background, achievement and organizational problems of these agencies.

POL 338. CONTEMPORARY AMERICAN FOREIGN POLICY (4)
Analysis of the development and scope of United States foreign policy focusing upon our aims, decision-making, application of policies, and alternatives for specified problem areas in foreign affairs.

POL 341. POLITICAL PARTIES (4)
PR: POL 201 or CI. The development, structure, operation and significance of political parties in the American system of government.

POL 343. EMPIRICAL POLITICAL ANALYSIS (4)
An introduction to the conduct of empirical political inquiry and to research methods. Techniques of data generation, collection, and analysis will be emphasized. Laboratory exercises required.

POL 345. PRIVATE GROUPS AND PUBLIC POLICY (4)
Role of non-party groups in the American society and their impact on public policy; growth of interest groups, internal politics, and formation of public policy.

POL 347. CONTEMPORARY SOUTHERN POLITICS (4)
Comparative study of selected political patterns and trends in the eleven southern states since 1950. Analysis of such topics as massive resistance, the civil rights movement, black political participation, factional division within the Democratic Party and the growth of presidential and gubernatorial Republicanism.

POL 351. INTRODUCTION TO PUBLIC ADMINISTRATION (4)
PR: Upper level standing. An examination of the administrative principles and processes by which public policies are implemented in a democratic society.

POL 405. POLITICS OF THE SOVIET UNION (4)
Development of the Soviet political system since the Revolution. Theory and practice of Communism in the contemporary Soviet Union.

POL 410. POLITICAL SYSTEMS OF SOUTHEAST ASIA (4)
PR: Upper level standing. Comparative analysis of political systems and practices in Southeast Asian countries with emphasis on the nature of nationalism, political development and revolutionary processes in the region.

POL 415. MILITARY POWER IN INTERNATIONAL POLITICS (4)
PR: POL 331, Upper Level Standing or CI. A study of the role of military power affecting war and peace in modern international politics. Among the issues covered are, limited war, nuclear deterrence, balance of power, conventional war, guerrilla warfare, disarmament and nuclear proliferation.

POL 421. GOVERNMENT AND POLITICS OF THE FAR EAST (4)
Development of political ideas and institutions in Japan and China with emphasis on 20th century issues.

POL 425. POLITICS OF LATIN AMERICA (4)
Comparative analysis of political systems of Latin America, with emphasis on modernization, the role of the military, revolutionary processes, and inter-American relations.
POL 428. POLITICS OF AFRICA (4)
Development and growth of emerging African political systems and their relations with each other and with states outside of Africa.

POL 431-432. CONSTITUTIONAL LAW (4,4)

POL 434. JUDICIAL POLITICS (4)
Consideration of selected theories of judicial decision-making. Examination and application of social science methodology to the study of court systems PR: POL 431 or POL 432.

POL 438. COMPARATIVE FOREIGN POLICY (4)
Comparative study of foreign policy behavior of nations. Analysis of formulation and objectives of foreign policies.

POL 441. THE AMERICAN PRESIDENCY (4)
The presidency as an institution of American democracy; constitutional status and powers, administrative responsibilities, legislative and political leadership, decision-making process.

POL 443. POLITICAL BEHAVIOR (4)
PR: Upper level standing or CI. Economic, psychological and social dimensions of political behavior; political participation, leadership and elites; political attitudes; voting behavior and decision-making processes.

POL 453. URBAN GOVERNMENT (4)
An introduction to the theory of urbanism, formal and informal structures that govern urban areas, new patterns and policy emphasis of urban government.

POL 454. URBAN POLITICS (4)
PR: Upper level standing, POL 203 or equivalent. An examination of the political processes and systems in urban and suburban communities in America.

POL 455. THE AMERICAN LEGISLATIVE PROCESS (4)
Intensive analysis of the nature of the legislative process in the United States; organization, procedure, leadership, relation with other governmental agencies, group tactics, decision-making process in the formation of policy.

POL 457. PROBLEMS OF PUBLIC FISCAL ADMINISTRATION (4)
PR: POL 351 or CI. Analysis of problems in the growth and development of public budgets with emphasis on principal techniques and theories of fiscal administration.

POL 461. CLASSICAL POLITICAL IDEAS (4)
PR: POL 199 or CI. Basic political ideas from the works of Plato, Aristotle, Cicero, St. Augustine, St. Thomas Aquinas and other leading Greek, Roman, and Medieval-Christian political philosophers.

POL 462. CLASSICAL POLITICAL IDEAS (4)
PR: POL 199 or CI. Basic political ideas from the works of Machiavelli, Bodin, Hobbes, Locke, Montesquieu, Rousseau, Burke, Bentham and other leading modern political philosophers.

POL 463. AMERICAN POLITICAL THOUGHT (4)
PR: Upper level standing. American political thought from the Colonial period to the present with emphasis on recent contributions.

POL 464. MODERN POLITICAL THOUGHT (4)
PR: Upper level standing. Basic political ideas from the works of 19th and 20th century political philosophers.

POL 481. INDIVIDUAL RESEARCH (1-4)
PR: 3.0 average in Political Science and CC. Investigation of some aspect of political science culminating in the preparation of an original research paper.

POL 491. SENIOR SEMINAR (4)
PR: Senior standing and completion of all preceding core requirements in Political Science. Designed to give the student an opportunity to examine and apply various concepts and methods in the field of political science to some integrated problem area.
FOR SENIOR LEVEL AND GRADUATE STUDENTS

POL 520. ADMINISTRATION OF URBAN AFFAIRS (4)
An analysis of the role of the administrator at the municipal level stressing the division of functions, policy formation, alternative governmental structures and their effect on administrative processes.

POL 523. PROBLEMS OF PUBLIC PERSONNEL ADMINISTRATION (4)
An analysis of recruitment, testing, training, employee and human relations in the public service.

POL 527. COMPARATIVE PUBLIC ADMINISTRATION (4)
Comparison of certain aspects of public administrative systems of various governments, emphasizing such writers as Siffin, Hadari, Appleby, Hu, Simon and Riggs.

POL 530. LEGAL AND REGULATORY PROCESSES (4)
Systematic study of the political-judicial factors in the regulatory process of administrative agencies.

POL 550. METHODOLOGICAL AND CONCEPTUAL PROBLEMS IN COMPARATIVE AND INTERNATIONAL POLITICS (4)
Examination of problems and concepts in the study of comparative and international politics, emphasizing theoretical and empirical relations and relative advantages of different levels and units of analysis. May be repeated for credit.

POL 561. POLITICS OF THE DEVELOPING AREAS (4)
An analysis of the ideologies, governmental structures, and political processes of selected nations of the non-Western world.

POL 571. FIELD WORK (4)
PR: 3.0 average in Political Science and CI. Application of research models now employed in governmental agencies; including developing a structured research proposal, preparing a network program comprising the elements making up the proposal and a research paper. Designed to give the student practical experience in the administrative and political processes.

FOR GRADUATE STUDENTS ONLY

POL 600. SCOPE AND METHODS OF POLITICAL SCIENCE (4)
Advanced study of the scope and methodologies of political science, including their applications to different research areas.

POL 620. URBAN POLICY ANALYSIS (4)
Systematic examination of the organizational and administrative characteristics of planning, program development and reporting activities conducted at local levels by various state, regional and federal agencies.

POL 623. URBAN FINANCIAL ADMINISTRATION (4)
Examination of organizational structure and administrative processes of urban fiscal agencies, sources of revenue, expenditures and indebtedness, and current problems in budgeting.

POL 625. PROBLEMS IN URBAN POLITICS (4)
Analysis in depth of pressure group behavior and its role in municipal policy formulation, including the study of community power approaches advanced by Rossi, Sofen, Kammarer, Martin and others.

POL 627. ADMINISTRATIVE BEHAVIOR AND PUBLIC POLICY FORMATION (4)
Analysis of the formal, informal and societal characteristics of public bureaucracies and their impact on public policy.

POL 640. POLITICAL SOCIALIZATION (4)
Seminar in selected phases of the political socialization process.

POL 643. CONTEMPORARY POLITICAL IDEAS AND BEHAVIOR (4)
Study of certain phases of political philosophy and theories of modern political analysis.

POL 645. SEMINAR IN STATE POLITICS (4)
Analysis of selected topics in American state politics. May be repeated for credit as topics vary.
PSYCHOLOGY

POL 650. SEMINAR IN POLITICAL REVOLUTION AND CHANGE (4)
Analysis of selected contemporary problems relating to political revolution and change.

POL 662. SEMINAR IN COMPARATIVE POLITICS (4)
Comparative analysis of political systems in terms of processes, institutions, and behavior. May be repeated for credit.

POL 665. SEMINAR IN INTERNATIONAL ORGANIZATIONS AND ADMINISTRATION (4)
Analysis of various phases of international organizations and their administrative systems.

POL 667. SEMINAR IN INTERNATIONAL RELATIONS (4)
Investigation of selected phases of international relations in world politics.

POL 670. SEMINAR IN AMERICAN GOVERNMENT AND POLITICS (4)
Analysis of selected current problems in American government and politics.

POL 675. SEMINAR IN INTERNATIONAL RELATIONS (4)
Investigation of selected phases of international relations in world politics.

POL 677. SEMINAR IN ADMINISTRATIVE PROCESS (4)
Analysis of various administrative processes emphasizing policy formulation, implementation, programming, new concepts of management in a public service environment.

POL 680. INDIVIDUAL RESEARCH (4)
Study in depth of a special problem in political science approved by a thesis committee.

POL 690. MASTER'S THESIS (1-9)

PORTUGUESE

See MODERN LANGUAGES

PSYCHOLOGY

Faculty: Kimmel, chairman; Achenbach, Bitterman, Clement, Dertke, Fowler, Hawkins, Kramer, LaBarba, Mourer, Nelson, Penner, Rahn, Sandler, Sidowski, Stein, Strong, Toth, Woodard

PSY 201. INTRODUCTION TO PSYCHOLOGY (5)
A survey of major topics in psychology (learning, perception, thinking, intelligence, etc.), and an introduction to methods used in psychological investigation. Lecture plus discussion.

PSY 311-312. RESEARCH METHODS IN PSYCHOLOGY (4:1)
PR: PSY 201 and SSI 301. Scientific research methods and their applications for psychology. Topics include experimental planning, control procedures, and interpretative principles. Lecture plus lab. Must be taken concurrently.

PSY 313. APPLIED PSYCHOLOGY (4)
PR: PSY 201 or Cl. The application of psychological principles and the functions of psychologists in education, government, industry, and clinical practice. NOT FOR MAJOR CREDIT.

PSY 335. PSYCHOLOGY OF ADJUSTMENT (4)
PR: PSY 201 or Cl. Genetic, organic and learned factors involved in the processes of personal adjustment; applications of mental health principles to everyday living. NOT FOR MAJOR CREDIT.

PSY 341. CHILD PSYCHOLOGY (4)
PR: PSY 201 or Cl. Developmental and psychosocial aspects of childhood, including hereditary, maturational, psychological, and social determinants of child behavior. NOT FOR MAJOR CREDIT.
PSY 401. GENERAL PSYCHOLOGY (4)
PR: Upper-division standing. Designed to give the advanced undergraduate non-major an opportunity to acquire concepts within the field of psychology and relate these to other areas of study. NOT FOR MAJOR CREDIT.

PSY 402. PSYCHOLOGY OF LEARNING (4)
PR: PSY 201, SSI 301, PSY 311-312. Survey of methods, empirical findings and theoretical interpretations in conditioning, instrumental learning, and verbal learning. Lec-lab.

PSY 403. DEVELOPMENTAL PSYCHOLOGY (4)
PR: PSY 201, SSI 301, PSY 311-312. Survey of methods, empirical findings and theoretical interpretations in the study of human and animal development. Lec-lab.

PSY 404. SOCIAL PSYCHOLOGY (4)
PR: PSY 201, SSI 301, PSY 311-312. Behavior of the individual human being as affected by the social and cultural influences of society. Lec-lab.

PSY 405. NEUROPSYCHOLOGY (4)

PSY 411. EXPERIMENTAL DESIGN AND ANALYSIS (4)
PR: PSY 201, SSI 301, PSY 311-312. Detailed coverage of those research designs and statistical techniques having the greatest utility for research problems in psychology. Emphasis on topics from analysis of variance.

PSY 415. SYSTEMATIC PSYCHOLOGY (4)
PR: PSY 201, SSI 301, PSY 311-312. The historical roots of modern psychological theories, investigation of the various schools of psychology such as behaviorism, Gestalt psychology, psychoanalysis, and phenomenological psychology.

PSY 421. MOTIVATION (4)
PR: PSY 201, SSI 301, PSY 311-312, 402, 405. An examination of human and animal motivations for both physiological and psychological viewpoints. Emphasis will be given to current research.

PSY 425. COMPARATIVE PSYCHOLOGY (4)
PR: PSY 201, SSI 301, PSY 311-312, 402, 405. The study of the evolution of behavior, similarities and differences in capacities for environmental adjustment and for behavioral organization among the important types of living beings from plants and unicellular organisms to the primates including man.

PSY 432. INDUSTRIAL PSYCHOLOGY (4)
PSY 201, SSI 301, PSY 311-312, 404. Application of psychological principles to industry. Topics considered: Man-machine systems, development of skills, training, employee attitudes, worker motivation, accident prevention, fatigue and monotony.

PSY 436. PSYCHOLOGICAL ASSESSMENT (4)
PR: PSY 201, SSI 301, PSY 311-312, 403. A consideration of the instruments for intellectual achievement, and personality assessment including their applications, development, and potential abuses. Students may not receive credit for both PSY 436 and EDF 303, Introduction to Measurement and Evaluation.

PSY 441. VERBAL BEHAVIOR (4)
PR: PSY 201, SSI 301, PSY 311-312, 402. Survey methods, empirical findings and theoretical interpretations of verbal learning and retention, concept learning and information processing.

PSY 445. PERCEPTION (4)
PR: PSY 201, SSI 301, PSY 311-312, 405. How man perceives his environment. Topics include sensory bases of perception, physical correlates of perceptual phenomena, and the effects of individual and social factors on perception. Primary emphasis on vision and audition. Lec-lab.

PSY 452. PERSONALITY (4)
PR: PSY 201, SSI 301, PSY 311-312, 402, 403. Methods and findings of personality theories and an evaluation of constitutional, biosocial, and psychological determinants of personality. Lec-lab.
PSY 455: PSYCHOPATHOLOGY (4)
PR: PSY 201, SSI 301, PSY 311-312, 402, 403. A study of the classifications of variant behavior and some of the hypotheses used to explain such behavior.

PSY 481. SELECTED TOPICS: RESEARCH (1-4)
PR: Upper division standing and CI. The student plans and conducts an individual research project under the supervision of a psychology faculty member. May be repeated with a maximum of eight hours credit.

PSY 485. SELECTED TOPICS: READING (1-4)
PR: Upper division standing and CI. A reading program of topics in psychology is conducted with the supervision of a psychology faculty member. May be repeated with a maximum of eight hours credit.

PSY 491. SELECTED TOPICS: SEMINAR (4-8)
PR: Upper division standing and CI. Graduate-type seminar designed to provide the advanced undergraduate student with the opportunity to interact with the faculty and other students for the purpose of developing an in-depth understanding of a selected sub-area within psychology. May be repeated with a maximum of eight hours credit.

FOR GRADUATE STUDENTS ONLY

PSY 608. EXPERIMENTAL SOCIAL PSYCHOLOGY (5)
PR: CI. Analysis and laboratory experience in research methods of social psychology, with particular consideration of attitude measurement, systematic observational methods, sociometrics, stimulation of social behavior, interviewing, and content analysis. lec-lab.

PSY 609. MOTIVATION AND EMOTION (5)
A detailed examination of human motivation and emotion from both the physiological and psychological viewpoints. Emphasis will be given to current research.

PSY 610. OPERANT BEHAVIOR (5)
PR: CI. Review of the basic literature of operant conditioning and major areas of research and application. Supervised laboratory experience in programming basic schedules of reinforcement.

PSY 611. PSYCHOPATHOLOGY (5)
Exploration of current approaches to the understanding of pathological behavior and implications for theories of personality. A survey of treatment methods is included.

PSY 613. BEHAVIORAL DISORDERS OF CHILDREN (5)
Causative factors in behavior deviations common to children and adolescents. Thorough study of selected childhood mental disorders and a survey of ameliorative techniques for treating childhood behavior difficulties. Students may not receive credit for both PSY 613 and EDS 531, Behavior Disorders in the Schools.

PSY 615. PERSONALITY ASSESSMENT (5)
PR: PSY 617. Interview, case history, objectives and projective tests are surveyed together with a critical review of the history and theory of assessment. Special consideration is given to study of interrelations between research, diagnostic data, and personality theory.

PSY 617. INDIVIDUAL INTELLIGENCE TESTING (5)
History and objectives of intelligence testing. Methods used in the construction of individual intelligence tests. Intensive experience in the administration and interpretation of the Wechsler tests, Stanford-Binet, and Grace Arthur tests. Students may not receive credit for both PSY 617 and EDF 617, Measurement of Individual Intelligence.

PSY 619. INTRODUCTION TO COUNSELING AND PSYCHOTHERAPY (5)
Examination of theory and practices in counseling and psychotherapy. The role of the counselor and the nature of the therapeutic relationship is emphasized. Professional and ethical issues are considered.

PSY 620. SUPERVISED RESEARCH (1-5)
PR: CI. May be repeated for credit. The student works in close collaboration with a faculty member in designing, conducting and interpreting experiments.
PSY 621. APPLICATIONS OF LEARNING PRINCIPLES & PROCEDURES (5)
PR: Prior course in learning, or CI. Application of various learning principles and procedures to problems in specialized settings. Co-listed with the Rehabilitation Institute (REH 621)

PSY 631, 632, 633. RESEARCH METHODS AND MEASUREMENT I, II, & III (5,5,5)
PR: Admission to M.A. program in psychology or CI. Three-quarter sequence designed to cover research methods and strategies and their application to psychology. Topics include logic and purpose of experimentation in psychology, measurement theory, design and analysis of experiments, probability, statistical inference, analysis of variance, correlational methods, interpretation of experimental findings. Required for M.A. degree except by waiver by the student's advisory committee.

PSY 634. PHYSIOLOGICAL PSYCHOLOGY (5)
PR: Admission to M.A. program in psychology or CI. Neural and physiological foundations of behavior. Structure and function of the central nervous system and autonomic nervous system. Physiological basis of learning, motivation in sub-humans and humans. Required for M.A. degree unless waived by examination or by student's advisory committee. First quarter.

PSY 635. DEVELOPMENTAL PSYCHOLOGY (5)
PR: Admission to M.A. program in psychology or CI. Detailed study of the development of human and animal behavior aimed toward an understanding of ontogenetic contributions to later behaviors. Effects of early experience on later behavior. Required for M.A. degree unless waived by examination or by student's advisory committee. First quarter.

PSY 636. LEARNING AND MOTIVATION (5)
PR: Admission to M.A. program in psychology or CI. Habituation, sensitization, classical and instrumental conditioning, generalization, discrimination, trial and error learning, problem solving. Required for M.A. degree unless waived by examination or by student's advisory committee. Second quarter.

PSY 637. PERSONALITY AND PSYCHOPATHOLOGY (5)
PR: Admission to M.A. program in psychology or CI. Analysis of traditional and current theories of personality and psychopathology with applications to etiology and treatment of behavior disorders. Required for M.A. degree unless waived by examination or by student's advisory committee. Second quarter.

PSY 638. COGNITION AND PERCEPTION (5)
PR: Admission to M.A. program in psychology or CI. Current data and theory of perceptual and thought processes. Consideration of physiological and psychological variables in perception and cognition and applications of information and signal detection theory. Required for M.A. degree unless waived by examination or by student's advisory committee. Third quarter.

PSY 639. SOCIAL PSYCHOLOGY (5)
PR: Admission to M.A. program in psychology or CI. Overview of theory and research in social psychology. Attitudes, values, group processes, leadership, conformity, social learning and motivation. Required for M.A. degree unless waived by examination or by student's advisory committee. Third quarter.

PSY 640. APPRENTICESHIP IN PSYCHOLOGY (2)
PR: Admission to M.A. program in psychology. By arrangement with faculty in psychology. Tutorial interaction in scientific or clinical work of faculty member. To be taken each of the first three quarters of first year of M.A. work. Required for M.A. degree. May be repeated for a maximum of 6 hours credit.

PSY 650. ELECTROPHYSIOLOGICAL METHODS (5)
PR: PSY 634 or CI. Introduction to the use of electrophysiological methods in psychological research. This will involve actual experience in use of oscilloscopes, polygraphs, EEG techniques, stereotaxic procedure, stimulation and lesioning techniques, use of microtome, and staining and mounting of tissue sections. Lec-lab.
PSY 682. PRACTICUM IN PSYCHOLOGY (5)
Supervised observation and training in various community and university clinic, research and/or industrial settings.

PSY 689. GRADUATE SEMINAR IN LEARNING (5)
May be repeated for credit.

PSY 690. GRADUATE SEMINAR IN PERCEPTION (5)
May be repeated for credit.

PSY 691. GRADUATE SEMINAR IN PHYSIOLOGICAL PSYCHOLOGY (5)
May be repeated for credit.

PSY 692. GRADUATE SEMINAR IN SOCIAL PSYCHOLOGY (5)
May be repeated for credit.

PSY 693. GRADUATE SEMINAR ON ISSUES IN CLINICAL PSYCHOLOGY (5)
May be repeated for credit.

PSY 694. GRADUATE SEMINAR IN DEVELOPMENTAL PSYCHOLOGY (5)
May be repeated for credit.

PSY 695. GRADUATE SEMINAR IN PERSONALITY (5)
May be repeated for credit.

PSY 696. GRADUATE SEMINAR IN COGNITIVE PROCESSES (5)
May be repeated for credit.

PSY 697. GRADUATE SEMINAR IN QUANTITATIVE METHODS (5)
May be repeated for credit.

PSY 698. GRADUATE SEMINAR IN INDUSTRIAL PSYCHOLOGY (5)
May be repeated for credit.

PSY 699. THESIS (5)
A study in depth of a problem in psychology approved by a thesis committee. Student stands an oral examination on the thesis.

REHABILITATION

Faculty: Pinkard, director; Ebra, Landsman, Pasach, Turner.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

REH 501. REHABILITATION: CONCEPTS AND THEORETICAL ISSUES (5)
A look at the historical origin, development and current understanding of the philosophy of rehabilitation. The rehabilitation process is viewed as an integration of concepts and procedures from the medical, social-psychological, and legal disciplines. The clinical, legal, societal, and self definitions of disability are studied together with their implications for the orientation and dimensions of service programs for the handicapped.

REH 502. ISSUES AND PROBLEMS IN REHABILITATION COUNSELING (5)
PR: CI. Focuses on techniques for the effective utilization of one's self in the various coordinating relationships of the rehabilitation process.

REH 503. MEDICAL ASPECTS OF DISABILITY (4)
Study of medical information needed by the counselor in integrating medical services into the total rehabilitation process from referral to placement. Examines the effect of a client's physical condition on various areas of adjustment. Includes appraisal of physical capacities in terms of functional limitations and individual differences.

REH 504. PSYCHIATRIC ASPECTS OF DISABILITY (4)
A survey of modern treatment and diagnostic procedures used by the mental health professions to assist the handicapped and disadvantaged to deal with various disabilities. Patterns and participation of rehabilitation professionals in this helping process are analyzed and evaluated.

REH 505. SPECIAL PROBLEMS IN REHABILITATION COUNSELING (5)
PR: PSY 619 or CI. The course will focus on specific counseling problems relating to special disabilities that are unique to the rehabilitation process.

REH 506. EVALUATION IN THE REHABILITATION PROCESS (5)
PR: REH 501 or CI. Methods and techniques employed to assess the mental,
social, and vocational problems of handicapped persons. Particular attention will be given to the contribution of diagnosis of vocational potential in programs aimed at helping disabled individuals reach their highest possible capacity.

REH 507. PRINCIPLES AND PRACTICES OF REHABILITATION SERVICES: PRACTICUM I (5)
PR: Minimum of 15 hours of REH courses. Procedures appropriate to meeting the full range of needs of the handicapped individual as he completes the sequence of rehabilitation services. Supervised experience in observation and participation in counseling services in various rehabilitation agencies.

FOR GRADUATE STUDENTS ONLY

REH 604. RESEARCH AND METHODOLOGY IN REHABILITATION (5)
PR: Statistics, or CI. The aim of this course is to help students evaluate and utilize available research studies as well as to develop their own research skills. An individual research project is required.

REH 605. SOCIAL FACTORS IN REHABILITATION (5)
Application of a sociological frame of reference to physical and mental impairment. Discussion of societal values and norms relative to the partially and totally disabled. Analysis of the role of the disabled in the basic institutionalized subsystems of society, with implications for the rehabilitation process.

REH 606. VOCATIONAL PLACEMENT AND ADJUSTMENT OF THE DISABLED (5)
A study of occupations, vocational theories, pre-placement counseling, vocational placement techniques, follow-up procedures, and the psycho-social aspects of work as they pertain to rehabilitating disabled and disadvantaged persons.

REH 607. SELECTED TOPICS IN REHABILITATION (2-5)
PR: 15 hours of REH graduate courses or equivalent. Designed to give the graduate student an opportunity to study in depth some concept, procedure, or body of data in the rehabilitation field. Course work will consist of directed individual study and a relevant research project or paper. Course may be repeated once for credit.

REH 610. PRINCIPLES AND PRACTICES OF REHABILITATION SERVICES: PRACTICUM II (5)
PR: REH 507 and completion of a minimum of 30 hours of REH courses. Supervised practice in the application of knowledge and skills acquired in previous courses and in REH 507. Experience in rendering rehabilitation services to the moderately and severely disabled in at least two appropriate community facilities.

REH 620. INTERNSHIP IN REHABILITATION (15)
PR: REH 507, REH 610. Student placement in an approved intern setting for a minimum of 400 hours supervised experience.

REH 621. APPLICATIONS OF LEARNING PRINCIPLES AND PROCEDURES (5)
PR: Prior course in Learning or CI. Application of various learning principles and procedures to problems in specialized settings. See PSY 621.

RELIGIOUS STUDIES

Faculty: Tremmel, chairman; Gessman, DeHainaut, Bassuk, Haywood.

REL 300 INTRODUCTION TO RELIGION (4)
An examination of the phenomenon of religion, which will include (1) an examination of why people do religion; (2) an examination of the character of theology, with special attention to certain basic theological concepts such as God, sin, salvation, liberation, reincarnation, immortality, theism, atheism; (3) an analysis of the character of religious ritual in its metatechnological, sacramental and experimental form; and (4) an examination of the place and character of moral systems in religion.
REL 310. OLD TESTAMENT STUDIES (4)
An introduction to the critical study of the Hebrew Scriptures against the background of the ancient Near East, with attention to the history and religion of the Hebrew people.

REL 315. NEW TESTAMENT STUDIES (4)
An introduction to the critical study of the New Testament in context of Christian beginnings in the first century A.D.

REL 325. HISTORY OF JUDAISM (4)
The historical development of Judaism and Jewish concepts from biblical times to the modern era with emphasis on the formative years from the Prophets to the close of the Talmud.

REL 327. HISTORY OF CHRISTIANITY I (4)
The historical development of Christianity, its ideas and institutions, from the Establishment of Constantine to the Council of Trent.

REL 328. HISTORY OF CHRISTIANITY II (4)
The historical development of Christianity, its ideas and institutions from the work of John Wycliff to the rise of "religious modernism" in the 19th century.

REL 329. RELIGION IN AMERICA (4)
To examine the movement from state church to pluralism in American religious institutions; the religious results of non-Protestant immigration; the Jewish factor; the effect of home missions and social concern programs upon American life; political entanglements and the concept of church/state separation.

REL 350. WORLD RELIGIONS — EASTERN (5)
An introduction to and a comparison of the ideas, the literature, the institutions of the major religions of the Eastern World, especially Buddhism (Theravada, Mahayana, Zen), Hinduism, Jainism, Taoism, Confucianism, Shinto.

REL 351. WORLD RELIGIONS — WESTERN (5)
An introduction to and a comparison of the ideas, the literature, the institutions of the major religions of the Western (Near Eastern origin) World — Judaism, Zoroastrianism, Christianity, and Islam. And a general comparison of Western religious ideas with Eastern religious ideas.

REL 360. DIALOGUES IN RELIGION (4)
A course designed to place in dialogic encounter various aspects of contemporary religious beliefs and practices for the purpose of enabling students to hear and participate in discussions concerning the claims and procedures of existing religions.

REL 370. CONTEMPORARY RELIGIOUS THOUGHT (4)
An examination of the central ideas of recent theological thinkers; such men as Barth, Brunner, Bultmann, Bonhoeffer, Rahner, Tillich Cox, Altizer, Buber, Niebuhr.

REL 383. SELECTED TOPICS (credits vary)
PR: CI. Course contents depend on students' needs.

REL 385. DIRECTED READINGS (credits vary)
PR: CI. Individual guidance in concentrated reading on a selected topic.

REL 481. UNDERGRADUATE RESEARCH (credits vary)
PR: Junior standing and CI. Individual investigations with faculty supervision.

REL 483. SELECTED TOPICS (credits vary)
PR: Junior standing and CI. Course contents depend on students' needs.

REL 491. SEMINAR IN RELIGION (4)
A course designed for persons, especially Religious Studies majors, whose prior religious studies have prepared them for a cooperative creative and/or research effort in the area of religion.

REL 583. SELECTED TOPICS (credits vary)
PR: Senior standing and CI. Course contents depend on students' needs.
RUSSIAN

See MODERN LANGUAGES

SOCIAL SCIENCES (Interdisciplinary)

Faculty: Orr, chairman; Achenbach, E. Allen, Arnade, Bell, Bosserman, Dilkes, Fuson, Hansen, Hawkins, Hechiche, Jreisat, Kaplan, Nelson, Nesman, Rothwell, Seligsohn, Strong, Swanson, Wheeler, Winthrop, Woodard.

SOCIAL SCIENCE STATISTICS (4)
Topics selected from the following: measures of central tendency and variability, probability and the normal curve, correlations, curve fitting, scale and index number theory, polling, interview and survey techniques, content analysis. Students who successfully complete this course may not also receive credit for either ECN 331 Business and Economic Statistics or MTH 345 Introductory Statistics.

SSI 311. COMMUNICATION (4)
Topics selected from the following: the language of structure, general semantics, communication networks, language and social perception, diffusion of information, communication and social gamesmanship, Aesopian language and Nu-Think in politics, normative language of clinical psychology, communication and pseudo-events, non-verbal communication.

SSI 315. PUBLIC OPINION AND PRESSURE MECHANISM (4)
The content and formation of public opinion, properties of opinions and attitudes, and the principles and mechanisms of their formation and change.

SSI 321. HUMAN RELATIONS AND PRODUCTIVITY (4)
Topics to be selected from the following: the relation of science, technology, resources, energy, and population change to social, economic, cultural and political change; social implications of research findings from the social, behavioral and management sciences.

SSI 325. PSYCHOLOGY AND THE SOCIAL ORDER (4)
Topics to be selected from the following: the quest for personal identity in modern mass society, the problems of mass culture and mass education, the problems of alienation and anomie in the 20th century, psychological factors in political and industrial conflict, man versus the machine in modern life.

AREA STUDIES

The following five courses (SSI 339, 341, 343, 345 and 347), dealing with one or more countries of a given region, will select and emphasize subject matter from the following topics: its history, its people and their cultures, its social psychology and national characteristics, its resources, its economic and industrial characteristics, its literature, religion and dominant values, its political framework and outlook, its social structure, and its current problems.

Each course may be repeated when countries of concentration vary, but the same country may not be repeated for credit.

SSI 339. EUROPE (4)
SSI 341. LATIN AMERICA (4)
SSI 343. ASIA (4)
SSI 345. AFRICA (4)
SSI 347. THE MIDDLE EAST (4)
SSI 361. COMMUNISM IN THE MODERN WORLD (4)
An interdisciplinary approach to the nature of Communism, its philosophic bases, its anti-religious bias, its economic, social and political theories and practices, the arts and sciences under Communist ideology, its conduct of foreign affairs and associated programs and techniques. Emphasis will be on Soviet and Chinese Communism.

SSI 411. SOCIAL ISSUES OF OUR TIME (4)
Topics to be selected from the following: automation and cybernation and the social problems they generate; special problems of a technological civilization; the implications of changing social patterns of Western culture and opportunities for social re-construction.

SSI 413. LEISURE IN SOCIETY (4)
Facts and trends of changing leisure-time patterns in the USA and other countries; various conceptualizations of leisure; relationships of non-work time to work attitudes, personality, family, community, sub-cultures, religion, value systems, social class, and the functions of government.

SSI 415. THE CITY AND MAN (4)
Topics to be selected from the following: the city and its ills; proposed new types of community formation; planning and community; the social ecology of the city; conventional versus innovative approaches to the problems of the community.

SSI 449,450. THE EMERGING NATIONS (4,4)
PR: Upper division standing or CI. CI required to take SSI 450 out of sequence. This course examines the processes and problems involved when an underdeveloped country seeks to develop a modern industrial civilization.

SSI 481. DIRECTED RESEARCH (1-4)
PR: CI plus upper division standing. May be repeated. To provide advanced students with interdisciplinary research experience in areas of specific interest.

SSI 485. DIRECTED READINGS (1-4)
PR: CI plus, upper division standing. May be repeated. To provide advanced students with intensive reading of interdisciplinary nature in areas of specific interest.

SSI 491. SENIOR SEMINAR
PR: Senior standing and CI. To provide an integrating seminar experience for International Studies majors.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

SSI 503. CONTEMPORARY AMERICAN CULTURE (4)
A social analysis of the leading characteristics, ideals, and values of American life. An effort will be made to deal with a variety of contexts in which American cultural themes, standards and practices receive expression.

SSI 505. SOCIAL VALUES AND SOCIAL ORDER (4)
Topics to be selected from the following: the value-patterns of modern societies; social bases for a world order; the aims and functions of social planning; international transformation created by science and technology.

SSI 583. SELECTED TOPICS (1-4)
PR: CI plus senior standing or graduate status. May be repeated. To provide advanced students with interdisciplinary study of selected topics.

FOR GRADUATE STUDENTS ONLY

SSI 601. SOCIAL PATHOLOGY (4)
An examination of the variety of social criticism which has been leveled at Western society and of some of the defenses which have been made in its behalf. Materials will be chosen from several of the social sciences.

SSI 681. DIRECTED RESEARCH (1-4)
PR: CI and graduate standing. May be repeated. To provide graduate students with interdisciplinary research experience in areas of specific interest.
SSSI 685. DIRECTED READINGS (1-4)
PR: CI and graduate standing. May be repeated. To provide graduate students with an intensive reading of interdisciplinary nature in areas of specific interest.

SOCIOLOGY

Faculty: Wheeler, chairman; Bosserman, Brandmeyer, Cameron, Emond, Davidson, Feinberg, Gagan, B. Gunter, Hansen, D. P. Johnson, Kutcher, E. Nesman, Schneller, Senior, R. Smith, Stine.

SOC 201. INTRODUCTION TO SOCIOLOGY (4)
Nature and application of sociological concepts, theories and methods; analysis of societies, associations and groups; social processes and social change.

SOC 251. MARRIAGE (4)
Study of pre-marital and marital relations. Social, cultural and personal factors related to success and failure in mate selection and marriage.

SOC 261. SOCIAL PROBLEMS (4)
Descriptive and analytical consideration of major social problems in modern industrial societies, with emphasis on American society.

SOC 301. INTRODUCTION TO SOCIAL WELFARE (4)
PR: SOC 201 or CI. The historical and contemporary development of organized social services and institutions to meet human needs.

SOC 315. FOUNDATIONS OF THEORY (4)
PR: SOC 201 or CI. Consideration of selected theories of sociology and procedures of systematic theory construction.

SOC 321. SOCIAL INVESTIGATION (4)
PR: SOC 201, SSI 301. Methods and techniques of social research. Design of sociological studies, collection of data, and interpretation of results.

SOC 331. SOCIAL PSYCHOLOGY (4)
PR: PSY 201 or SOC 201. Behavior of the individual human being as affected by social and cultural influences of modern society.

SOC 341. SOCIAL ORGANIZATION (4)
PR: SOC 201 or CI. Social organization in the broadest sense, including institutions and associations, as well as variations in role and status.

SOC 345. SOCIAL STRATIFICATION (4)
PR: SOC 201 or CI. Social status and social stratification, social class as a factor in behavior, social mobility.

SOC 351. THE FAMILY (4)
PR: SOC 201 or CI. Principles of family organization, social adjustment and control. Maturation, socialization and stability of the family.

SOC 371. RACIAL AND ETHNIC RELATIONS (4)
PR: SOC 201 or CI. Comparative study of interracial relations, social tensions, attitudes, and modes of adjustment in various areas of the world.

SOC 373. SOCIOLOGY OF RELIGION (4)
PR: SOC 201 or CI. Types, sources, and functions of religious behavior. Religious behavior in relation to other aspects of personality and culture.

SOC 447. SOCIOLOGICAL IMPLICATIONS OF INDUSTRIALIZATION (4)
PR: SOC 201 or CI. Socio-cultural elements which define and accompany the process of industrialization as observed in mature industrial nations.

SOC 481. INDIVIDUAL RESEARCH (1-4)
PR: Four courses in sociology, including SOC 321, upper division standing or CI. Content dependent upon interests and competence of the student.

SOC 491. SENIOR SEMINAR (4)
For seniors majoring in sociology or other social sciences. Major issues in sociology, stressing theory and research.
FOR SENIOR LEVEL AND GRADUATE STUDENTS

SOC 505. COMMUNITY WELFARE RESOURCES (4)
PR: SOC 301 or CI; upper division standing. Emphasis upon voluntary programs and their development, planning and coordination.

SOC 531. SOCIAL INTERACTION (4)
PR: SOC 331, or CI; upper division standing. Interpersonal influence, complex behavior, role, conflict, and social situational factors.

SOC 533. COLLECTIVE BEHAVIOR (4)
PR: SOC 201 or CI; upper division standing. Study of the development of group and mass behavior—crowds, social movements.

SOC 535. SOCIOLOGY OF SMALL GROUPS (4)
PR: SOC 201 or CI; upper division standing. Theory of small group structure, mechanics of interaction, observation of small groups.

SOC 541. SOCIAL CHANGE (4)
PR: SOC 201 or CI; upper division standing. Major theories of social and cultural change, and mechanisms of change in various societies.

SOC 543. URBAN SOCIOLOGY (4)
PR: SOC 201 or CI; upper division standing. The social structure of the community in modern industrial societies. Analysis of community change.

SOC 553. SOCIOLOGY OF THE ARTS (4)
PR: SOC 201 or CI; upper division standing. The creation, distribution and use of arts from a sociological perspective; the social roles involved.

SOC 561. CRIMINOLOGY (4)
PR: SOC 201 or CI; upper division standing. Etiology of criminal behavior; law enforcement, crime in the United States; penology and prevention.

SOC 563. JUVENILE DELINQUENCY (4)
PR: SOC 201 or CI; upper division standing. Theories of delinquency, patterns of delinquent behavior, methods of control and treatment.

SOC 571. POPULATION (4)
PR: SOC 201 or CI; upper division standing. Sociological determinants of fertility, mortality, and migration; theories of population change.

SOC 575. INDUSTRIAL SOCIOLOGY (4)
PR: SOC 201 or CI; upper division standing. Interaction, communication and authority in economic organizations; the factory as a social system.

SOC 583. TOPICS IN SOCIOLOGY (4)
PR: 16 quarter hours in Sociology and prior consent of instructor. May be repeated for credit. See class schedule for content.

FOR GRADUATE STUDENTS ONLY

SOC 611. CONTEMPORARY SOCIOLOGICAL THEORY (4)
PR: Undergraduate course in sociological theory or CI. Emphasizes logical and conceptual dimensions of theory and theory construction.

SOC 621. METHODS OF RESEARCH (4)
PR: Course in Social Investigation or CI. Logic and practice of research; problems of observation and data collection, data processing, and evaluation.

SOC 623. SOCIOLOGICAL STATISTICS (4)
PR: SSI 301 or CI. Logic and application of parametric and nonparametric statistical analysis for sociological data.

SOC 631. SOCIAL PSYCHOLOGY SEMINAR (4)
PR: Course in Social Psychology or CI. stresses contemporary developments in social psychological theory and empirical research.

SOC 641. COMMUNITY ANALYSIS (4)
PR: Course in Urban Sociology or CI. Theories of community and community organization. Methods of community study; problems of urban areas.

SOC 643. COMPLEX ORGANIZATIONS (4)
PR: Course in Social Organization or CI. Organizational theory, bureaucratic models, authority, power legitimation, and types of formal organization.
SOC 651. FAMILY ANALYSIS (4)
PR: Course in Family or CI. Theory of interpersonal relations and interaction in the modern family. Analysis of functions and roles.

SOC 661. SOCIAL CONTROL (4)
PR: Course in criminology or juvenile delinquency or CI. Theories of control and deviance with research application in problem areas.

SOC 671. SOCIAL GERONTOLOGY (4)
PR: Four courses in social sciences with two in sociology, or CI. Theory of aging. Social correlates of aging, retirement, and personality modification.

SOC 681. GRADUATE RESEARCH (1-4)
PR: CI. Content and method dependent upon interest and competence of student.

SOC 691. THESIS AND THESIS SEMINAR (5)
PR: Equivalent of 16 quarter hours in the student’s graduate program, SOC 611, 623, 621.

SOC 692. THESIS AND THESIS SEMINAR (5)
PR: Equivalent of 16 quarter hours in the student’s graduate program, SOC 611, 623, 621. May be taken concurrently with SOC 691.

SPANISH
See MODERN LANGUAGES

SPEECH

Faculty: J. Popovich, chairman; Bindert, Brady, Downs, Galati, Heck, Jones, Lucoff, Newcombe, Partney, Perez, Schneider, Sisco, Steck.

SPE 103. SPEECH FOR FOREIGN STUDENTS I (5)
A special course for students learning English as a second language. Intensive study and drill in American English pronunciation and listening comprehension. May be taken in conjunction with CBS 100-English for Foreign Students.

SPE 104. SPEECH FOR FOREIGN STUDENTS II (5)
PR: SPE 103 or CI. Intensive study and drill in American English pronunciation and listening comprehension. Emphasis on diction and speaking skills.

SPE 201. FUNDAMENTALS OF SPEECH (5)
The nature and basic principles of speech; emphasis on improving speaking and listening skills common to all forms of oral communication through a variety of experiences in public discourse.

SPE 203. SPEECH IMPROVEMENT AND PHONETICS (5)
Designed to improve vocal quality and expressiveness, articulation, and pronunciation, and to give instruction and practice in using the International Phonetic Alphabet for speech improvement.

SPE 241. INTRODUCTION TO BROADCASTING (5)
PR: SPE 201 or 203. Introduction to the principles, tools and skills involved in radio and television broadcasting.

SPE 311. INTRODUCTION TO SPEECH SCIENCE (5)
PR: SPE 203 or CI. Communication models are broken down and each portion analyzed. Emphasis on quantifiable parameters of effective speaking.

SPE 320. ISSUES AND INTERPRETATION (2)
The study of literature through analyses of printed textual materials and of the visual-aural textual performance of them. May be repeated.

SPE 321. FUNDAMENTALS OF ORAL READING (5)
PR: SPE 201 or 203. Designed to develop proficiency in the understanding and oral communicaton of literary and other written materials.

SPE 322. ORAL INTERPRETATION PERFORMANCE (2)
PR: SPE 321 or CI. The study, rehearsal, and performance of literature for Readers Theatre and Chamber Theatre productions. May be repeated (maximum total 6 hours).
SPE 343. BROADCAST SPEECH (5)
PR: SPE 203. The development of skills required for effective announcing, acting, newscasting and other speaking before microphone and camera.

SPE 345. BROADCASTING AND SOCIETY (5)
The communication process and influence of broadcasting upon society.

SPE 347. RADIO PRODUCTION AND DIRECTION (5)
PR: SPE 241. Radio production and direction, laboratory and broadcasting experience.

SPE 348. RADIO PRACTICUM (2)
PR: SPE 347 or CI. The study, rehearsal, and production of radio programs. May be repeated once.

SPE 349. WRITING FOR RADIO AND TELEVISION (5)
PR: SPE 347. The writing of radio and television scripts such as documentaries, children's programs, commercials, dramas, talks, and demonstrations.

SPE 351. INTRODUCTION TO AUDIOLOGY AND SPEECH PATHOLOGY (5)
PR: SPE 203. The nature, causes and principles of treatment of speech and hearing disorders.

SPE 360. CURRENT ISSUES AND RHETORIC (2)
An analysis of significant current speakers and issues. May be repeated.

SPE 361. GROUP DISCUSSION AND CONFERENCE METHODS (5)
PR: SPE 201 or CI. Principles and methods of leading and participating in various types of group discussion and conference. Emphasis on reflective thinking and group dynamics.

SPE 362. TECHNICAL COMMUNICATION (5)
Investigation and application of methodology and effective technical communication for effective oral presentation of technical reports.

SPE 363. PUBLIC SPEAKING (5)
PR: SPE 201 or CI. Study of selected public addresses as aids in speaking extemporaneously and from manuscript. The relationship between public speaking and public policy formulation.

SPE 365. ARGUMENTATION AND DEBATE (5)

SPE 366. FORENSICS (2)
PR: SPE 365 or CI. The study, library research and investigation, and practice in forensics. Application of the principles of rhetoric to the current debate and discussion topics. May be repeated (maximum of 6 hours).

SPE 367. FORMS OF PUBLIC ADDRESS (5)
PR: SPE 363 or 365. An advanced course emphasizing arrangement and style in informative, persuasive and ceremonial public address.

SPE 369. PARLIAMENTARY SPEAKING (3)
Principles of parliamentary procedure and practice in conducting and participating in meetings governed by parliamentary rules.

SPE 381. UNDERGRADUATE RESEARCH (credits vary)
PR: Junior standing and CI. Individual investigations and faculty supervision.

SPE 383. SELECTED TOPICS (credits vary)
PR: Junior standing and CI.

SPE 385. DIRECTED READINGS (credits vary)
PR: Junior standing and CI.

SPE 411. SPEECH BEHAVIOR AND PROCESSES (5)
PR: SPE 203 or CI. Study of the theories of the simple and complex acoustical phenomenon of speech; intensive analysis of the stimulus-feedback variables of speech.

SPE 441. TELEVISION PRODUCTION AND DIRECTION (5)
PR: SPE 241. An introductory course in the techniques of producing and directing television programs.
SPE 442. ADVANCED TELEVISION PRODUCTION AND DIRECTION (5)
PR: SPE 441. Intensive study and practice of the techniques of television production and direction with emphasis on both creative and administrative aspects.

SPE 443. TELEVISION PRACTICUM (2)
PR: SPE 442 or CI. The study, rehearsal, and production of television programs. May be repeated once.

SPE 444. STATION MANAGEMENT (5)
PR: SPE 345. To acquaint the student with the problems of managing a radio and/or television station. To provide the student with realistic opportunities to solve management problems and create programming plans for a broadcast organization.

SPE 445. BROADCAST PRODUCTION CRITICISM (5)
PR: SPE 442. The study of contemporary broadcast programming techniques and practices. Extensive listening and viewing.

SPE 447. HISTORY OF BROADCAST PROGRAMMING (5)

SPE 448. PUBLIC BROADCASTING (5)
PR: SPE 345. The study of public broadcasting as informational, cultural, and instructional media with special attention on programming.

SPE 449. SEMINAR IN BROADCASTING (5)
PR: SPE 442. Intensive examination and discussion of electronic media in their social, economic, legal, and political contexts with specific emphasis on programming.

SPE 481. UNDERGRADUATE RESEARCH (credits vary)
PR: Senior standing and CI. Individual investigations with faculty supervision.

SPE 483. SELECTED TOPICS (credits vary)
PR: Senior standing and CI.

SPE 485. DIRECTED READINGS (credits vary)
PR: Senior standing and CI.

SPE 491. SENIOR SEMINAR: PROBLEMS IN ORAL COMMUNICATION (2)
PR: Senior Standing. Exploration of problems in all aspects of speaking and listening with emphasis upon an overview of the arts and sciences of oral communication.

SPE 492. SENIOR SEMINAR: PROBLEMS IN ORAL COMMUNICATION (3)
PR: SPE 491. Intensive analysis of the complexities of scholarly investigation in special areas of the arts and sciences of oral communication.

FOR UPPER LEVEL AND GRADUATE STUDENTS

SPE 501. SPEECH BEHAVIOR AND PROCESSES (5)
PR: Upperclass standing. Study of the theories of the simple and complex acoustical phenomenon of speech; intensive analysis of the stimulus-feed back variables of speech.

SPE 503. APPLIED PHONETIC TRANSCRIPTION (5)

SPE 511. EXPERIMENTAL PHONETICS (5)
PR: SPE 203. Understanding and application of experimental methods in analyzing speech sounds. Emphasis upon important research findings, instruments and methodologies in the laboratory study of normal speech. Development of phonetic skills of discrimination and reproduction of speech sounds.

SPE 521. ORAL INTERPRETATION OF DRAMATIC LITERATURE (5)
PR: SPE 321 or CI. Critical appreciation and Oral Interpretation of special textual materials which are inherently dramatic in nature and poetry, narrative prose, drama, biography, and history.

SPE 522. ORAL INTERPRETATION OF POETRY (5)
PR: SPE 321 or CI. Critical appreciation of lyric and narrative poetry and communication of that appreciation to an audience. Study of poetic theory and prosodic techniques.
SPE 523. LITERARY ADAPTATION AND ORAL INTERPRETATION (5)
PR: SPE 521. Practice in composition and adaptation of literary materials for oral presentation; an investigation of the more advanced problems in oral interpretation as in Choral Speaking and Chamber Theatre.

SPE 524. ORAL INTERPRETATION OF DRAMATIC LITERATURE, II (5)
PR: SPE 521. A study of selected pre-modern dramas with special emphasis on problems of interpretation for oral performance.

SPE 525. ORAL INTERPRETATION OF CHILDREN'S LITERATURE (5)
PR: SPE 321 or CI. A study of the theories and practice in the oral interpretation of poetry and narrative fiction for children with special emphasis on classical and modern literature for children.

SPE 526. ORAL INTERPRETATION OF BIBLICAL LITERATURE (5)
PR: SPE 321 or CI. A critical interpretation and oral presentation of selected Books of the Old and New Testaments.

SPE 561. THEORY AND RESEARCH IN SMALL-GROUP COMMUNICATION (5)
PR: SPE 361. Advanced study of theories and research in communicative interaction in group discussion and conference.

SPE 565. HISTORY AND CRITICISM OF PUBLIC ADDRESS (5)
PR: SPE 363 or CI. The principles of rhetorical criticism applied to selected great speeches of Western Civilization.

SPE 567. PERSUASION (5)

SPE 581. RESEARCH (credits vary)
PR: Senior or graduate standing and CI.

SPE 583. SELECTED TOPICS (credits vary)
PR: Senior or graduate standing and CI.

SPE 585. DIRECTED READINGS (credits vary)
PR: Senior or graduate standing and CI.

SPE 593. LANGUAGE AND SPEECH FOR CHILDREN (5)
PR: SPE 203 or CI. A diagnostic study of language development; the analysis of speech behavior and oral language needs of children; techniques of speech improvement for children.

FOR GRADUATE STUDENTS ONLY

SPE 603. ADVANCED PHONETICS (5)
PR: SPE 503 or equivalent. Intensified training in close phonetic transcription. Work on dialects, intonation, distinctive feature theory and acoustic phonetics.

SPE 611. COMMUNICATION: ANALYSIS AND MEASUREMENT (5)
A study of selected modes of communication. Includes analysis of communication symbolism, and presents the theory and application of selected instruments for measuring and producing speech.

SPE 612. SEMINAR IN SPEECH SCIENCE (5)
PR: SPE 511. To provide graduate students with an opportunity to interact with faculty and other students for the purpose of developing an in-depth understanding of a selected sub-area of Speech Science.

SPE 621. HISTORY AND THEORIES OF ORAL INTERPRETATION (5)
A study of the history, critical writings, uses, and developments of the art of oral interpretation, with analysis of the principles and practices.

SPE 661. CLASSICAL RHETORIC (5)
Greek and Roman theory and practice; emphasis on Aristotle, Plato, Cicero, and Quintilian, selected other readings.

SPE 662. MODERN RHETORICAL THEORY (5)
Studies of Eighteenth and Nineteenth Century theorists and the historical and cultural forces influencing them; relationship to contemporary theory and practice.
SPE 665. HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS (5)
Criticism of selected speeches and speakers of American public address, studied
against a background of political, social and intellectual issues.

SPE 667. CONTEMPORARY RHETORICAL THEORY (5)
Studies in Speech and language; Speech as symbol, theories of meaning, the rela-
tion of language, thought, and action.

SPE 668. EXPERIMENTAL RESEARCH IN ORAL COMMUNICATION (5)
Critical examination of research design, procedures, and reporting of experimental
studies in small group communication and persuasive discourse.

SPE 681. GRADUATE RESEARCH (1-5)
Directed study in special projects. Recommended only when material cannot be
studied in scheduled courses.

SPE 683. SELECTED TOPICS IN SPEECH (1-5)

SPE 685. DIRECTED READINGS (1-5)

SPE 691. GRADUATE SEMINAR IN ORAL COMMUNICATION (5)
PR: Graduate standing and CI. Instruction and experience in teaching the
University’s basic Speech courses. Credit not applicable toward the graduate
degree in Speech. May be repeated.

**SPEECH PATHOLOGY AND AUDIOLOGY**

*Faculty:* Webb, director; Bloch, Carlson, Daughtry, Diebold, Edwards, Fobair,
Glover, Husband, Kasun, Kemp, Kinde, Knight, Kuffel, LaPorte, Logue,
McClumpa, Morse, Ritterman, Seamens, Sexton, Vanderman.

SAI 201. SURVEY OF COMMUNICATION DISORDERS (3)
The nature and prevention of disorders of communication.

SAI 301. SPEECH PATHOLOGY (6)
PR: SAI 201 or CI. An introduction to speech and language disorders: major treat-
ment approaches, etiologies and research findings.

SAI 302. AUDIOLOGY (6)
PR: SAI 201 or CI. An introduction to disorders of hearing: major treatment ap-
proaches, etiologies and research findings.

SAI 311. THE SCIENCE OF COMMUNICATION DISORDERS I (6)
PR: SAI 201 or CI. Structural bases of communication disorders.

SAI 312. THE SCIENCE OF COMMUNICATION DISORDERS II (6)
PR: SAI 201 or CI. Research approaches to the study of communication disorders.

SAI 313. THE SCIENCE OF COMMUNICATION DISORDERS III (6)
PR: SAI 201 or CI. Systems of analysis of communication disorders.

SAI 483. SELECTED READINGS (Topic) (4)
PR: CI. May be repeated three times for credit.

SAI 498. INTRODUCTION TO SPEECH PATHOLOGY & AUDIOLOGY
PRACTICUM (1-12)
PR: SAI 301 or 302. Observation and participation in speech pathology and audio-
logy practicum in the University clinical laboratory.

SAI 511. INSTRUMENTATION I (6)
PR: SAI 301. Calibration and instrumentation in speech pathology.

SAI 512. INSTRUMENTATION II (6)
PR: SAI 302. Calibration and instrumentation in audiology.

SAI 513. THE SCIENCE OF COMMUNICATION DISORDERS (6)
PR: SAI 301 and 302 or CI. Learning approaches useful in the management of
speech and hearing impairments.

SAI 571. EVALUATION OF ORAL COMMUNICATION DISORDERS (6)
PR: SAI 301 or CI. Articulation, voice, language and stuttering disorders. Re-
porting, case management, referral and professional relationships.
SAI 572. AUDIOLOGY I (6)
PR: SAI 302 or CI. Evaluation of auditory and visual communication skills of the hearing impaired.

SAI 573. AUDIOLOGY II (6)

SAI 574. METHODS FOR ORAL COMMUNICATION DISORDERS (6)
PR: SAI 571 or CI. Classic and experimental approaches to and systems of evaluation of therapy in the management of speech impaired individuals.

SAI 575. MANAGEMENT OF COMMUNICATION DISORDERS (4)
PR: SAI 573, SAI 574 or CI. Coordination, planning, and structuring of programs for individuals with communications disorders.

SAI 576. COMMUNICATION DISORDERS: VOICE (4)
PR: SAI 574 or CI. Research and clinical literature on voice and voice disorders.

SAI 577. COMMUNICATION DISORDERS: ARTICULATION (4)
PR: SAI 574 or CI. Research and clinical literature on articulation and articulation disorders.

SAI 578. COMMUNICATION DISORDERS: STUTTERING (4)
PR: SAI 574 or CI. Research and clinical literature on stuttering and related disorders.

SAI 579. TECHNIQUES OF AUDITORY TRAINING (4)
PR: SAI 574 or CI. Auditory training of the hearing impaired.

SAI 580. COMMUNICATION DISORDERS: LANGUAGE (4)
PR: SAI 574 or CI. Research and clinical literature on language disorders.

SAI 581. SUPERVISED RESEARCH (1-12)
PR: CI.

SAI 583. SELECTED READINGS (Topic) (4), (4), (4)
PR: CI.

SAI 598. SPEECH PATHOLOGY & AUDIOLOGY PRACTICUM (1-12)
PR: CI. Practicum for clinical speech pathology and audiology.

FOR GRADUATE STUDENTS ONLY

SAI 620. CLEFT PALATE (4)
PR: CI. Research and clinical literature on cleft palate as related to speech pathology and audiology.

SAI 621. APHASIA (4)
PR: CI. Research and clinical literature on aphasia as related to speech pathology and audiology.

SAI 622. CEREBRAL PALSY (4)
PR: CI. Research and clinical literature on cerebral palsy as related to speech pathology and audiology.

SAI 623. DIALECT AS A COMMUNICATION DISORDER (4)
PR: CI. Research and clinical literature on dialect as a communication disorder.

SAI 673. CHILD AUDIOLOGY (4)
PR: CI. Survey of available procedures for the early identification of hearing loss with a pediatric population.

SAI 674. SPECIAL AUDITORY TESTS (4)
PR: CI. Knowledge and skills regarding speech reception, malingering, GSR and EEG systems of hearing testing.

SAI 675. TECHNIQUES OF SPEECH READING (4)
PR: CI. Knowledge and skill regarding methods of teaching lip reading to hard-of-hearing and deaf individuals.

SAI 676. HEARING DISORDERS (4)
PR: CI. The use, coordination and interpretation of hearing test data as regards diagnosis of hearing problems.

SAI 677. HEARING CONSERVATION (4)
PR: CI. Information regarding prevention of hearing loss in children and adults in industry, schools and other settings.

SAI 680. RESEARCH PROCEDURES IN SPEECH PATHOLOGY AND AUDIOLOGY (4)
PR: CI.
SAI 681. GRADUATE RESEARCH (1-12)
PR: CI. May be repeated for credit.
SAI 683. SELECTED READINGS (Topic) (4), (4), (4).
PR: CI.
SAI 698. PRACTICUM IN SPEECH PATHOLOGY (1-12)
PR: CI. Field experience in Speech Pathology and Audiology practicum. Conducted in community facilities for speech, hearing and language impaired individuals.
SAI 699. THESIS (1-9)

THEATRE ARTS

Faculty: Whaley, chairman; Belt, A. Golding, Kase, Lorenzen, Mecham, O'Sullivan, Phillips, C. H. Williams, Zachary.

TAR 203. INTRODUCTION TO THEATRE (3)
The nature of theatre as an art form. "How does a play mean?" Orientation and identification for the understanding of theatre. Open to all students and required of Theatre Arts majors.

TAR 211. FUNDAMENTALS OF STAGE PERFORMANCE (3)
Elementary principles and methods of stage performance with emphasis on inner creativity and physical expression.

TAR 212. STAGE MOVEMENT AND SPEECH (3)
PR: TAR 211 or CI. An exercise investigation of the nature and possibilities of human movement and sound in the theatre.

TAR 221. STAGECRAFT (3)
Basic design practice, color and drafting as applied to stage and television settings. Practical exercises in construction, painting, and mounting of scenery, with participation in performance productions.

TAR 252. STAGE MAKE-UP (1)
History, theory and practice of make-up for the stage.

TAR 303. MODERN THEATRE PRACTICE (5)
Initial readings and exercises in theatre; play analysis, performance, and technical theatre for non-theatre majors.

TAR 311. ACTING I (3)
PR: TAR 211, 212, or CI. Intermediate principles and methods of stage performance; mime, improvisation, speech, deportment, and characterization.

TAR 313. DIRECTING I (3)
PR: TAR 411. Staging the play, including script analysis, business, composition, movement and rhythm; rehearsal procedures and general organization. Lecture-laboratory using illustrative exercises and scene work.

TAR 322. STAGE PROPERTIES (3)
An investigation of historic architecture, decor, and furnishings for the theatre designer and director with practical exercises in duplication for the stage.

TAR 339. HISTORY OF THE THEATRE (5)
A survey of the chronological development of world theatre.

TAR 352 PERFORMANCE (1)
The study, rehearsal, and performance of major theatrical works. Open to all University students by audition on a credit or non-credit basis. Credit members subject to critical examination. May be repeated.

TAR 361. INTRODUCTION TO PUPPETRY (3)
Principles and methods of puppetry with an historical survey of major forms and practical problems with laboratory production.

TAR 411. ACTING II (3)
PR: TAR 311 or CI. Intermediate exercises in stage performance with special emphasis on problems on genre, style, and interpretation.
THEATRE ARTS 295

TAR 413. DIRECTING II (3)
PR: TAR 313. Problems in directing. Script interpretation, composition and movement for genre and period, coaching the actor, designing the mise en scène.

TAR 421. SCENE DESIGN I (3)
PR: TAR 221 or CI. Aesthetics and theories of stage design with an historical study of the development of the physical theatre and scenery. Practical design problems.

TAR 422. SCENE DESIGN II (3)
PR: TAR 421. Continuation of Scene Design.

TAR 423. COSTUME DESIGN I (3)
PR: TAR 221. Aesthetics, design, and techniques of stage costuming. A survey of fashion of the Western World and its interpretation as costume for the stage.

TAR 424. COSTUME DESIGN II (3)
PR: TAR 423. Continuation of Costume Design.

TAR 425. STAGE LIGHTING I (3)
PR: TAR 221. Theories and techniques of lighting as they relate to production and theatre architecture.

TAR 426. STAGE LIGHTING II (3)
PR: TAR 425. Continuation of Stage Lighting I, with emphasis on lighting design.

TAR 429. TECHNICAL DIRECTING (3)
PR: TAR 421, 423, 425. Mounting the physical production. Lecture-lab using selected readings and practical problems in planning and producing the technical aspects of production.

TAR 431. THEATRE LITERATURE OF MYTH AND RITUAL: CLASSIC (3)
PR: TAR 339 or CI. The study of the development of dramatic form out of early religious rites and its full flowering in the works of Aeschylus, Sophocles, Euripides, Aristophanes, Menander, Plautus, and Terrence.

TAR 432. THEATRE LITERATURE OF MYTH AND RITUAL: MEDIEVAL (3)
PR: TAR 339 or CI. The rebirth of drama in the ancient Christian Church and a study of the theatre literature which grew out of these early beginnings.

TAR 433. LITERATURE OF THE RENAISSANCE THEATRE (3)
PR: TAR 339 or CI. Historical study of Renaissance drama; readings from the plays of Machiavelli, Goldoni, Lope de Vega, Calderon, Marlowe, Jonson, Corneille, Moliere, and Racine.

TAR 435. LITERATURE OF THE EIGHTEENTH CENTURY THEATRE (3)
PR: TAR 339 or CI. A study of English and Continental theatre literature from the restoration of the English monarchy to the fall of Napoleon.

TAR 436. LITERATURE OF THE NINETEENTH CENTURY THEATRE (3)
PR: TAR 339 or CI. A study of theatre literature from the late Romanticism of Hugo to the “Free Theatre” movement of the continent.

TAR 437. LITERATURE OF THE MODERN AND CONTEMPORARY THEATRE (3)
PR: TAR 339 or CI. Readings of contemporary American, British, and Continental drama from Appolinaire to Albee.

TAR 443. PLAYWRITING I (3)
PR: TAR 303 or equivalent, 3 hours of creative writing, and CI. Basic dramatic writing practices and conventions. Evaluation of student work in conferences. Study of selected readings. May be repeated.

TAR 444. PLAYWRITING II (3)
PR: TAR 443. Continuation of Playwriting. May be repeated.

TAR 454. EXPERIMENTAL THEATRE PERFORMANCE (2)
PR: TAR 211, 212, 352 or CI. The study, rehearsal, and laboratory performance of new and experimental works for the theatre. May be repeated to a total of 6 credits.

TAR 471. THEATRE MANAGEMENT (3)
A study of commercial, community, and educational theatre operation with special emphasis on box office management, production costs, contracts, publicity, and public relations.
FOR SENIOR LEVEL AND GRADUATE STUDENTS

TAR 501. DRAMATIC THEORY AND CRITICISM I (3)
PR: TAR 339 and any 2 from TAR 431, 432, 433, 435, 436, 437, or CI. A study of basic critical writings on the theatre from Aristotle to the present.

TAR 502. DRAMATIC THEORY AND CRITICISM II (3)
PR: TAR 501 or CI. Continuation of Dramatic Theory and Criticism I.

TAR 511. STYLES OF ACTING (3)
PR: TAR 411 or CI. Exercises in the performance problems of the actor in pre-modern plays. May be repeated for a total of 9 hours.

TAR 515. PERFORMANCE PRODUCTION (3)
PR: TAR 413, majors only, CI. Actual production work in which members of the class prepare a play for project performance, teamed with designers from TAR 529.

TAR 529. TECHNICAL PRODUCTION (3)
PR: TAR 421-422, 423-424, 425-426, majors only, CI. Actual production work in which students design and execute scenery, costumes, properties, and lighting for project performance, teamed with playwrights and/or directors from TAR 515.

TAR 543. ADVANCED PLAYWRITING (3)
PR: TAR 443, 444, and CI. Concentration on the writing of the full length play form, with selected readings and analysis of dramatic structure. May be repeated.

TAR 544. WRITING FOR THE SCREEN (3)
PR: TAR 443, 444, and CI. Planning and writing of the film short and feature film from rought scenario to finished screenplay. Selected readings and critical analysis of screenplays by Agee, Bergman, Kurosawa, Hitchcock, etc. May be repeated.

TAR 552. ADVANCED PERFORMANCE (1)
PR: TAR 352 or CI. The study, rehearsal, and performance of major theatrical works. Admission by audition. May be repeated.

TAR 554. ADVANCED EXPERIMENTAL THEATRE PERFORMANCE (2)
PR: TAR 454 or CI. The study, rehearsal, and laboratory performance of new and experimental works for the theatre. Admission by audition. May be repeated for a total of 6 hours.

TAR 565. THEATRE FOR CHILDREN (4)

TAR 567. INFORMAL THEATRE WITH CHILDREN (4)
PR: CI. Theories and techniques of informal theatre with children. Focus is on the creative development of the child through the process of improvised theatre.

TAR 581. DIRECTED STUDIES (1-9)
PR: CC. Independent studies in the various areas of Theatre Arts. Course of study and credits must be assigned prior to registration.

VISUAL ARTS

ART 201. VISUAL FUNDAMENTALS — DRAWING I (3)
Introduction to problems in drawing techniques and media.

ART 202. VISUAL FUNDAMENTALS — DESIGN I (3)
Introduction to problems primarily in two-dimensional design.

ART 301. VISUAL FUNDAMENTALS — DRAWING II (3)
PR: ART 201. Further exploration of drawing techniques and media.

ART 302. VISUAL FUNDAMENTALS — DESIGN II (3)
PR: ART 202. Further exploration of two and three-dimensional design, including letter forms as design elements.

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

ART 401. VISUAL FUNDAMENTALS — DRAWING III (3)
PR: ART 301. Continuation of ART 301. May be repeated.

ART 402. VISUAL FUNDAMENTALS — DESIGN III (3)
PR: ART 302. Continuation of ART 302. May be repeated.

ART 411. PAINTING TECHNIQUES (3)
PR: ART 401 and ART 402.

ART 421. SCULPTURE TECHNIQUES (3)
PR: ART 401 and ART 402.

ART 431. CERAMIC TECHNIQUES (3)
PR: ART 401 and ART 402.

ART 441. GRAPHIC TECHNIQUES (3)
PR: ART 401 and ART 402. Sec. 001 Intaglio, Sec. 002 Lithography, Sec. 003 Silkscreen.

ART 451. SPECIAL STUDIES IN MATERIALS AND CRAFTS (3)

ART 461. PHOTOGRAPHY I (3)
PR: ART 401 and ART 402 or CI. Consideration of basic technical and aesthetic factors involved in using black and white still photography as a vehicle for visual, artistic expression.

ART 462. PHOTOGRAPHY II (3)
PR: ART 461. Consideration of basic technical and aesthetic factors involved in using color still photography as a vehicle for visual, artistic expression.

ART 465. CINEMATOGRAPHY I (3)
PR: ART 461. Consideration of basic technical and aesthetic factors involved in using black and white silent motion pictures as a vehicle for visual, artistic expression.

ART 466. CINEMATOGRAPHY II (3)
PR: ART 465. Consideration of basic technical and aesthetic factors involved in using color and sound motion pictures as a vehicle for visual, artistic expression.

ART 470. PREHISTORIC AND ANCIENT ART (3)
A comprehensive study of Paleolithic, Neolithic, Egyptian, Assyrian and Mesopotamian painting, sculpture and architecture.

ART 471. GREEK AND ROMAN ART (3)
A comprehensive study of Aegean, Mycenaean, Etruscan, Greek and Roman painting, sculpture and architecture.

ART 472. MEDIEVAL ART (3)
A comprehensive study of early Christian, Byzantine and Medieval painting, sculpture, architecture and manuscript illumination.

ART 473. RENAISSANCE ART(3)
A comprehensive study of Renaissance and Mannerist painting, sculpture and architecture in Italy and Northern Europe.

ART 474. BAROQUE AND ROCOCO ART(3)
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 (3)
A comprehensive study of nineteenth century painting, sculpture and architecture in France and England.
ART 476. TWENTIETH CENTURY ART (3)
A comprehensive study of painting, sculpture and architecture from Cezanne to the present in Europe and the United States.

ART 477. ORIENTAL ART (3)
An introduction to the history of the arts of China, Japan and other non-Western countries.

ART 481. DIRECTED STUDY (1-6)
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.

FOR SENIOR LEVEL AND GRADUATE STUDENTS

ART 501. DRAWING (3)
PR: ART 401 and ART 402. Advanced problems in various drawing techniques. Emphasis on individual creative expression. May be repeated.

ART 511. PAINTING (3)
PR: ART 411. Advanced problems in the various painting techniques. Emphasis on individual creative expression. May be repeated.

ART 521. SCULPTURE (3)
PR: ART 421. Advanced problems in the various techniques of sculpture. Emphasis on individual creative expression. May be repeated.

ART 531. CERAMICS (3)
PR: ART 431. Advanced problems in the various ceramic techniques, including throwing and glaze calculation. May be repeated.

ART 541. GRAPHICS (3)
PR: ART 441. Advanced problems in the various graphic techniques. Emphasis on individual creative expression. Sec. 001 Intaglio, Sec. 002 Lithography, Sec. 003 Silkscreen. May be repeated.

ART 561. PHOTOGRAPHY III (3)
PR: ART 462. Advanced work in color and black and white photography culminating in development of personal photographic artistic statement. May be repeated.

ART 565. CINEMATOGRAPHY III (3)
PR: ART 466. Advanced studio work using black and white, color and sound as technical and aesthetic factors in visual, artistic productions. May be repeated.

ART 569. PURE CINEMA AS AUTONOMOUS VISUAL EXPRESSION (3)
PR: ART 461 or CI. Consideration of historical developments in cinematography emphasizing uses of special technical and visual possibilities unique to the aesthetics of the film art.

ART 570. CRITICAL STUDIES IN ART HISTORY (3)
PR: CI. Specialized intensive studies in art history. Specific subject matter varies. To be announced at each course offering. May be repeated.

ART 573. SEMINAR IN THE HISTORY OF ART HISTORY (3)
PR: Four courses in Art History at the 400 level. An examination of the origins of art history as a discipline and the changing nature of art history from Vasari to the present.

ART 581. RESEARCH (1-6)
PR: CC. May be repeated.

FOR GRADUATE STUDENTS ONLY

ART 611. PAINTING (3)
PR: CI. May be repeated.

ART 621. SCULPTURE (3)
PR: CI. May be repeated.

ART 631. CERAMICS (3)
PR: CI. May be repeated.

ART 641. GRAPHICS (3)
PR: CI. Sec. 001 Intaglio, Sec. 002 Lithography, Sec. 003 Silkscreen. May be repeated.
ART 661. PHOTOGRAPHY (3)
PR: CI. Advanced work in black and white and color photography. Emphasis upon personal/expressive use of the medium. May be repeated.

ART 665. CINEMATOGRAPHY (3)
PR: CI. Advanced development of technical and aesthetic factors in the visual, artistic production of films. May be repeated.

ART 670. ART HISTORY (3)
PR: CI. Special intensive studies in assigned areas. May be repeated.

ART 681. RESEARCH (1-6)
PR: CI. May be repeated.

ART 699. THESIS (1-6)
PR: CI. May be repeated.

ZOOLOGY
(See also Botany and Biology.)

ZOO 311. COMPARATIVE VERTEBRATE ANATOMY (6)
PR: BIO 201-203. Anatomy of selected vertebrate types emphasizing evolutionary trends. lec-lab. Qtr. 1.

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. Qtr. II.

ZOO 321. INTRODUCTORY ANIMAL PHYSIOLOGY (5)
PR: BIO 201-203. Functional histology and the primary functions of the organ systems will be stressed and related to the survival of the whole animal. The approach will be comparative and evolutionary and the emphasis will be on the vertebrates. lec-lab-disc. Qtr. III.

ZOO 411. HISTOLOGY (4)
PR: ZOO 311 and/or BIO 422. Comparative approach to the study of tissues and the relation of their structure and function. lec-lab. Qtr. I.

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. IV.

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. Qtr. II (odd numbered years).

ZOO 461. ANIMAL SOCIAL BEHAVIOR (5)
PR: CI. An introduction to comparative ethology, with emphasis on social behavior and the evolution of behavior. lec-lab. Qtr. I (odd numbered years).

ZOO 481. UNDERGRADUATE RESEARCH (1-6)
PR: CI. Individual investigation with faculty supervision. (S/U grade only.)

ZOO 483. SELECTED TOPICS IN ZOOLOGY (1-6)
PR: CI. Each topic is a program in directed study under supervision of a faculty member.

ZOO 491. SEMINAR IN ZOOLOGY (1)
PR: Upper division. May be repeated once. (S/U grade only.)

FOR SENIOR LEVEL 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 (4)  
PR: CL. 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 the local avifauna. lec-lab. Qtr. II.

ZOO 518. MAMMALOLOGY (5)  
PR: BIO 201-203 and CL. The biology of mammals, including systematics, ecology, natural history, and geographical distribution. lec-lab. Qtr. I.

ZOO 520. BIOLOGY OF ECHINODERMS (5)  
PR: ZOO 313, BIO 421. A study of the anatomy, physiology, and ecology of echinoderms. lec-lab. Qtr. I (even numbered years).

ZOO 521. COMPARATIVE PHYSIOLOGY (5)  
PR: ZOO 321, BIO 421. 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. 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. Qtr. III (odd numbered years).

ZOO 545. ZOOGEOGRAPHY (3)  

ZOO 546. MARINE INVERTEBRATE ZOOLOGY I (5)  
PR: BIO 201 and CL. The lower invertebrate phyla. Field trips to local intertidal and subtidal habitats required. lec-lab. Qtr. IV.

ZOO 547. MARINE INVERTEBRATE ZOOLOGY II (5)  
PR: BIO 201 and CL. The higher invertebrate phyla. Field trips to local intertidal and subtidal habitats required. lec-lab. Qtr. IV.

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. Qtr. III.

ZOO 557. MARINE ANIMAL ECOLOGY (5)  
PR: BIO 445 and ZOO 313. Investigations of energy flow, biogeochemical cycles and community structure in marine environments. lec-lab. Qtr. III.

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. Qtr. I.

FOR GRADUATE STUDENTS ONLY

ZOO 613. ADVANCED INVERTEBRATE ZOOLOGY (5)  
PR: ZOO 313. or CI. An advanced zoological study of selected invertebrate groups with emphasis on regionally significant forms. Laboratory and field work required. lec-lab.

ZOO 614. PLANKTON ECOLOGY (4)  
PR: ZOO 313 or ZOO 546 and 547. The relationships and distributions of planktonic organisms as affected by their physical, chemical, and biological environments. lec-lab.
ZOO 615. PLANKTON SYSTEMATICS (4)
PR: ZOO 313 or ZOO 546 and 547. The identification of plankton from different depth zones in the sea and from various oceanic regions. lec-lab.

ZOO 617. SYSTEMATIC ORNITHOLOGY (3)
PR: ZOO 517 and CI. The classification and distribution of the birds of the world. lec-lab.

ZOO 618. ADVANCED MAMMALOGY (4)
PR: ZOO 518. Important literature and developments in mammalogy. Students will undertake individual research problems. lec-lab.

ZOO 619. ADVANCED ICHTHYOLOGY (5)
PR: CI. Systematic ichthyology with particular reference to the important literature together with a historical introduction. Laboratory devoted to completion of a systematic problem by each student. lec-lab.

ZOO 620. FIELD ORNITHOLOGY (3)
PR: ZOO 517 and CI. The use of local population in the study of avian biology. 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 mechanisms. lec-lab.

ZOO 622. INVERTEBRATE PHYSIOLOGY (3)
PR: CI. A research-oriented study of selected topics in invertebrate physiology. Laboratory and field work required. lec-lab.

ZOO 623. PHYSIOLOGY OF MARINE ANIMALS (5)

ZOO 624. COMPARATIVE ENDOCRINOLOGY (5)
PR: BIO 521 or CI. An analysis of the similarities and differences between the hormonal mechanisms of mammals, other vertebrates, and invertebrates. lec-lab.

ZOO 626. POPULATION ECOLOGY (4)
PR: BIO 616 or CI. Application of new methods of applied mathematics, computer simulation, and formulation of models to describe biological populations. lec-lab.

ZOO 630. 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 633. PHYSIOLOGY OF FISHES (4)
PR: ZOO 521 or CI. An analysis of the physiological mechanisms of metabolism and integration in fishes with emphasis on marine forms. lec-lab.

ZOO 661. ADVANCED ANIMAL BEHAVIOR (4)
PR: ZOO 461 and CI. Recent advances in comparative animal behavior (ethology). lec-lab.

ZOO 681. GRADUATE RESEARCH (1-9)
PR: CI. Directed research on selected topics. May be repeated (S/U grade only)

ZOO 683. SELECTED TOPICS IN ZOOLOGY (1-6)
PR: CI.

ZOO 691. GRADUATE SEMINAR IN ZOOLOGY (1)
PR: Graduate standing. May be repeated. (S/U grade only)

ZOO 699. M.A. THESIS (1-9)
PR: CI. May be repeated to a maximum of 9 credits. (S/U grade only)
GLOSSARY

An explanation of terms with which the reader may not be familiar.

Academic Year: Beginning of Quarter I to end of Quarter IV.
Admission: Acceptance of a student for enrollment.
Class Standing Codes:
   1. Freshman
   2. Sophomore
   3. Junior
   4. Senior
   5. Baccalaureate degree holder
College: Unit within the University responsible for providing instruction in a given area of knowledge.
Continuing Education Program: Courses taken off-campus not applicable toward graduation unless approved by the degree certifying area.
Course: A unit of instruction in a particular subject; usually one quarter in length.
Curriculum: A group of courses, forming a major field of study, required for a degree.
Elective: Any of a number of courses from which a student is allowed to select. A free elective is one not required in the student’s curriculum.
Faculty: Persons in teaching and research; the instructional staff of the university.
Former Student Returning: A student who applied and enrolled for USF (not Continuing Education) courses and had been absent for two quarters since his last enrollment.
Full-Time Fee Student: A student taking seven quarter hours of credit, graduate, or undergraduate, or enrolled in a “work period” under the Cooperative Education Program.
Full-Time Student: A student taking twelve quarter hours of credit as an undergraduate; nine hours of credit as a graduate or enrolled on a “work period” under the Cooperative Education Program.
Grade Point Ratio (GPR): Ratio of grade points to quarter hours attempted.
Graduate Program: A course of study leading to an advanced degree.
Hour, Credit Hour, Quarter Hour: Unit of academic work. The number of quarter hours specified for a course is usually equal to the number of times the class meets each week.
Lower Level: A general term applying to courses and programs offered at the freshman and sophomore levels.
Major: Student’s academic area of concentration or field specialization.
Matriculation: The first registration following admission as a classified student.
Prerequisite: Prior study or authorization required to qualify for enrollment in a course.
Quarter: Period of instruction into which the academic year is divided.
Registration: Process of enrolling for classes.
Term: Period of instruction into which the academic year is divided (i.e., Quarter).
Upper Level: A general term applying to courses and programs offered at the junior and senior levels.
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All members of the University of South Florida's academic staff, including teaching, research, administrative and professional personnel, are listed below in alphabetical order. The listing includes name, highest degree, institution conferring the degree, and current rank and field as of December, 1970.

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