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FLORIDA TECHNOLOGICAL UNIVERSITY

COURSE DESCRIPTIONS

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ACCOUNTANCY

ACCY 101 Basic Concepts (3)

ACCY 102 Basic Concepts (3)

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

ACCY 307 Accounting Concepts (3)
PR: Junior standing. An accelerated course in accounting concepts for the student desiring an understanding of accounting theory and practice. Credit may not be earned in both ACCY 307 and the ACCY 101, 102, 103 sequence.

ACCY 308 Accounting for Engineers (3)
PR: Junior standing. Industrial accounting, estimated costs, budget procedures and records useful to the engineer. Use of accounting and cost control as tools. Enrollmenct restricted to engineering students.

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

ACCY 312 Intermediate Accounting (3)

ACCY 313 Advanced Accounting (3)
PR: ACCY 312 or consent of Instructor. Complex cases in partnership formation, expansion and liquidation; installment and special sales arrangements; mathematics of compound interest and annuities.

ACCY 314 Advanced Accounting (3)
PR: ACCY 313 or consent of Instructor. Cases of enterprises in distress, estates, trusts, and branches: basic principles and methods for parent and subsidiary relationships.

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

ACCY 322 Cost Accounting (3)

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

ACCY 341 Government Accounting (3)

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

ACCY 352 Federal Income Tax Accounting (3)

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

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

ACCY 491 Problem Analysis (3)

PR: Consent of Instructor. May be repeated for credit.

ALLIED HEALTH SCIENCES

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

ART

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

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

ART 207 20th Century Art (3)
ART 208 Ancient and Medieval Art (3)
ART 209 Renaissance, Baroque, and 19th Century Art (3)
ART 210 Oriental Art (3)

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

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

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

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

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

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

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

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

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

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

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

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

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

BIOL 105 General Biology II (3)
PR: BIOL 100. An integrated approach to the Botanical and Zoological Sciences; the effect of society on the environment and its biological implications; suitable, with BIOL 100, for meeting Environmental Studies Program requirements.

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

BIOLOGY
of property, personal and real, the law of bankruptcy, the law of suretyship.

BADM 484 Operations Research (3)
PR: ECON 221. Methods and models of operations research applied to specific business problems. Development of mathematical techniques and demonstrates its use in modern decision theory.

BADM 490 Senior Seminar: Business in Human Affairs (2)
Business issues and problems as they relate to human affairs. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to the student majoring in the College of Business Administration.

BADM 495 Business Policies (3)
PR: Senior standing and completion of all other business core course requirements, or consent of instructor. A study of problems confronting businessmen. The student will be expected to utilize the subject matter contained in the business core courses and his major in the analysis of business problems.

BADM 496 Business Research Methods (3)
PR: Graduate standing. Identification of areas for research, methods of business and economic research, and presentation and evaluation of the results.

CHEMISTRY

CHEM 100 Freshman Orientation (1)
A discussion session to acquaint students in the curriculum with the art, history, and current practice of chemistry.

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

CHEM 114,115 General Chemistry Laboratory (1,1)
PR: CHEM 111 or CHEM 161. A course to acquaint the non-major with some of the chemical arts as practiced in the inorganic, organic, and biochemical fields.

CHEM 121,122,123 Organic Chemistry (4,3,3)
Following an introduction of atomic structure, chemical periodicity, and stoichiometry, a study of spectroscopy and bonding in organic molecules is used to provide a bridge from the usual high school chemistry course to the study of organic chemistry. Fundamentals of organic chemistry including nomenclature, structure, reactions, and reaction mechanisms are covered.

CHEM 125 Organic Laboratory Techniques (2)
PR: CHEM 121. An introduction to the laboratory techniques of organic chemistry including the preparation, reaction, and analysis of organic compounds.

CHEM 126 Organic Laboratory Techniques (2)
PR: CHEM 122 and CHEM 124. A lecture-laboratory course for the development of laboratory skills through class-developed experiments. An open-ended approach is used.

CHEM 161,162,163 Chemical Principles (3,3,3)
An introductory study emphasizing the physical basis of chemistry and oriented toward the non-chemistry major. Stoichiometry, the periodic table, equilibrium, thermodynamics, kinetics, and atomic and molecular structure will be covered. Some descriptive inorganic chemistry will be included.

CHEM 215,216,217 Chemistry Fundamentals (3,3,3)
PR or OR: MATH 223. A course in the theory of chemical reactions. Atomic structure and chemical bonding theory, chemical periodicity, stoichiometry, equilibrium, thermodynamics, and kinetics will be included.

CHEM 351,352 Analytical Laboratory Techniques (3,3)
PR: CHEM 103 or CHEM 263, and CHEM 123; or CHEM 113. A lecture-laboratory course designed to establish a thorough understanding of modern methods of chemical analysis. The purpose of this course will be to prepare the student to propose methods of analysis for any material he may encounter. Qualitative and quantitative organic analysis as well as specific Instrumental techniques will be covered.

CHEM 361,362 Analytical Laboratory Techniques (3,3)
PR: CHEM 352, or CHEM 362 or CHEM 369. A lecture-laboratory course designed to establish a thorough understanding of modern methods of chemical analysis. The purpose of this course will be to prepare the student to propose methods of analysis for any material he may encounter. Qualitative and quantitative organic analysis as well as specific Instrumental techniques will be covered.
ECON 461 Business and Government (3)
PR: ECON 203. A survey of the most significant public policies affecting business firms.

ECON 471 History of Economic Thought (3)
PR: ECON 203. A study of the leading ideas of the major contributors to the development of economic thought.

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

ECON 499 Undergraduate Research (2-6)
PR: Consent of instructor. May be repeated for credit.

ECON 611 Economics of the Firm (3)
PR: Graduate standing. The application of microeconomic theory to planning and decision-making in the business firm. Emphasis will be on: demand estimation, production functions, measurement of costs, pricing objectives and policies, and government antitrust policy.

ECON 621 Aggregate Economics - Income, Employment, and Growth (3)
PR: Graduate standing. The application of macroeconomic theory to planning and decision-making in the business firm. Emphasis will be on: aggregate supply and demand; determinants of consumption, saving, and investment; government's stabilization role; and forecasting of economic fluctuations.

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

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

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

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

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

EDBE 203 Principles of Shorthand-III (3)
PR: EDBE 103, and EDBE 202 or equivalents. Development and refinement of sustained shorthand dictation, speed and vocabulary development.

EDBE 301 Shorthand Dictation (3)
PR: EDBE 103, and EDBE 202 or equivalents. Continued development and refinement of shorthand dictation and introductory communications productions.

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

EDBE 306 Office Technology (3)
PR: EDBE 103 or equivalent. Basic operation and function of technological media in modern business offices.

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

EDBE 406 Office Systems and Procedures (3)

EDBE 601 Curriculum Innovations in Business Education (3)
PR: CI. A critical analysis of the business curricula in post secondary schools; development of philosophy, objectives, and design of innovative programs in business.

ELEMENTARY EDUCATION - DEVELOPMENTAL
EDEL 301 Teaching Mathematics in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Consideration of selected themes, concepts; organizing for instruction, techniques and activities; class and individual diagnosis; remedial procedures.

EDEL 302 Mathematics Programs in the Elementary School (3)
PR: EDEL 301. Analysis of teaching arithmetic, geometry and measurement; philosophy and objectives; instructional materials; current research and new curricula.

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

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

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

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

EDEL 315 Teaching Science in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and activities; evaluation procedures.

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

EDEL 317 Teaching Social Science in the Elementary School (3)
PR: EDEL 316. Consideration of selected themes, problems, and concepts; organizing for instruction; techniques and materials; evaluation procedures.

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

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

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

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

EDEL 405 Language Arts in the Elementary School (5)
PR: Admission to Phase II or consent of instructor. Content, principles, materials and techniques involved in teaching, speaking, listening, writing, and spelling in the elementary school; organizing for instruction.

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

EDEL 407 Classroom Diagnosis and Treatment of Reading Difficulties (3)
PR: EDEL 311 and 312. Principles and techniques of diagnosis and remedial teaching with the disabled reader; factors related to reading problems: physiological, psychological, cultural; materials for instruction.
EDPE 408 Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in natural sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

EDPE 499 Social Science Programs in the Elementary School (3)
PR: Admission to Phase II or consent of instructor. Overview of the instructional program in the social sciences; philosophy and objectives; special problems; instructional materials; current research and new curricula.

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

EDPL 456 Elementary School Curriculum (4)
PR: Bachelor's degree or consent of instructor. Advanced study of the elementary school curriculum; patterns of organization; school services; individual subject areas; school related activities; investigation of trends; research and new curricula.

EDPL 456, 457 Directed Study in Elementary Education (3-5,3-5)
Workshop for the improvement of the elementary school curriculum. Open to in-service teachers.

EDPL 630 Trends in Elementary School Reading Education (3)
PR: Rank III Certificate or CI. Analysis of historical development and current trends in reading research.

PHYSICAL EDUCATION - DEVELOPMENTAL

EDPE 305 Rehabilitation Training Techniques (3)
PR: Admission to Phase II or consent of instructor. Recognition and rehabilitation of sports injuries including first aid.

EDPE 306 Administration and Coaching (3)
PR: Admission to Phase II or consent of instructor. Development of optimal individual and team performance in interscholastic athletics.

EDPE 307 School and Community Recreation (3)
PR: Admission to Phase II or consent of instructor. Knowledge and skills of after school activity and summer recreational programs.

EDPE 308 Human Performance Learning (5)
PR: Admission to Phase II or consent of instructor. Theories of movement and factors influencing the learning of gross and fine motor skills. (Includes lecture and laboratory).

EDPE 309 Kinesiology (5)
PR: Admission to Phase II or consent of instructor. The application of the structure of man to the study of human movement. (Includes lecture and laboratory).

EDPE 311 Exercise Physiology (3). See page 27.

EDPE 322 Exercise Physiology - Respiratory (5)
PR: ZOOL 234. A study of metabolic costs and respiratory adjustment to exercise.

EDPE 324 Instructional Analysis in Tennis (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 325 Instructional Analysis in Aquatics (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 326 Instructional Analysis in Gymnastics and Tumbling (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific motor learning patterns.

EDPE 327 Instructional Analysis in Golf (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 328 Instructional Analysis in Wrestling (5) (2)
Mechanical analysis of neuromuscular performances and optimal approach to specific learning patterns.

EDPE 329 Choreography of Contemporary Dance (4) (2)
Dance production as an art form.

EDPE 330 Rhythms, Notation, Meter and Form (2)
Elements common to music and movement.

EDPE 405 Organization and Administration of Secondary School Physical Education (3)
Nature and scope of secondary school physical education athletic, intramural and adaptive programs.

EDPE 406 Organization and Administration of Elementary School Physical Education (3)
Nature and scope of elementary school physical education athletic, intramural and adaptive programs.

EDPE 407 Family Living Concepts (5)
The ideas and principles of healthy family living.

EDPE 408 Contemporary Health Hazards (5)
The effects of drugs and other mood modifiers.

EDPL 601 Philosophical Foundations of Physical Education (3)
PR: Rank III Certificate or CI. Analysis of the forces and events leading to the development of current concepts in physical education.

EDPL 408 Teaching Strategies (3)
PR: Admission to Phase III. Seminar taken concurrently with student teaching. Problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

EDPL 409 Teaching Strategies (4)
PR: Bachelor's degree or consent of instructor. A seminar taken concurrently with Teaching Practicum, EDPL 465. Advanced problem study focused on current needs such as: classroom management and control, planning for instruction, and aspects of professionalism.

EDPL 458 Supervision of Professional Laboratory Experiences (3)
PR: Consent of instructor. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the Teacher Education Associate or Supervising Teacher.

EDPL 459 Supervision of Professional Laboratory Experiences (1)
Laboratory
PR: Consent of instructor. Participation as a Teacher Education Associate or Supervising Teacher in the Florida Technological University laboratory experience program. May be taken concurrently with EDPL 458.

EDPL 465,466 Teaching Practicum (5,5)
PR: Bachelor's degree and approved application. Directed observation, participation, and teaching in an elementary or secondary school under the direction of a selected teacher.

SECONDARY EDUCATION - DEVELOPMENTAL

EDSE 303 School Programs (3)
A study of the public school curriculum. Kindergarten through grade twelve.

EDSE 304 Instructional Techniques (3)
PR: Admission to Phase II. Procedures, applications, and evaluation of technical skills a teacher may employ in the classroom.

EDSE 305 Secondary School Curriculum (3)
PR: Admission to Phase II. Study of total school patterns with emphasis on new trends including: Individual subject areas, administration, supervision, school services and school related activities.

EDSE 306 Business Instructional Analysis (4)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in type-writing instruction.

EDSE 307 English Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching English.

EDSE 308 Mathematics Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials which have special application for teaching mathematics.

EDSE 309 Science Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school
EDSE 406 Business Instruction Analysis II (3)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in short-hand and related instruction.

EDSE 406 Business Instructional Analysis-III (3)
PR: Admission to Phase II. Techniques, materials, and instructional media; psychological principles, evaluation, and current trends in accounting and basic business instruction.

EDSE 407 Foreign Language Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching foreign language.

EDSE 408 Physical Education Instructional Analysis (4)
PR: Admission to Phase II. Study of course objectives for the high school curriculum and survey of methods and materials having special application for teaching physical education.

EDSE 409 Social Science Instructional Analysis (4)
PR: Admission to Phase II. Study of instructional programs in Social Sciences; objectives; materials; techniques; organization of instruction; evaluation procedures; current research.

EDSE 415 Reading in the Secondary School (3)
PR: Admission to Phase II or consent of instructor. Developmental reading for the junior and senior high school pupil.

EDSE 476 Secondary School Curriculum (4)
PR: Bachelor's degree or consent of instructor. Advanced study of secondary school curriculum; patterns of organization, school services, individual subject areas, school related activities; investigation of trends, research and new curricula.

EDSE 476, 477 Directed Study in Secondary Education (2,5,2,5)
Workshop for improvement of the secondary school curriculum. Open to in-service teachers.

EDSE 478 Instructional Analysis in Business (4)
PR: Bachelor's degree or consent of instructor. Advanced study of the instructional programs in Business; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 479 Instructional Analysis in English (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in English; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 485 Instructional Analysis in Foreign Language (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Foreign Language; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 486 Instructional Analysis in Mathematics (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Mathematics; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 487 Instructional Analysis in Physical Education (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Physical Education; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 488 Instructional Analysis in Science (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Science; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 489 Instructional Analysis in Social Sciences (4)
PR: Bachelor's degree or consent of instructor. Advanced study of instructional programs in Social Sciences; objectives; materials; techniques; organization for instruction; evaluation procedures; current research.

EDSE 491 Contemporary Biology (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as SMSG biology and other modern approaches to secondary school biology. (Same as BIOL 491.)

EDSE 492 Contemporary Chemistry (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems, and advanced topics included in courses such as CHEM Study and other modern approaches to secondary school chemistry. (Same as CHEM 491.)

EDSE 493 Contemporary Mathematics (3)
PR: Admission to Phase II or consent of instructor. Concepts, problems, and advanced topics included in courses such as SMSG mathematics and other modern approaches to secondary school mathematics. (Same as MATH 491.)

EDSE 494 Contemporary Physics (3)
PR: Admission to Phase II or consent of instructor. Concepts, experiments, problems and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. (Same as PHYS 491.)

EDSE 501 Curriculum Planning (3)
PR: Rank III Certificate or Cl. Identifying major concepts, writing objectives, listing activities and developing course layouts for a secondary school subject area.

TEACHING ANALYSIS
EDTA 206 Human Development (3)
Analysis of basic principles and applications in growth and learning from conception through adolescence. EDTA 207 recommended concurrently.

EDTA 306 Principles of Evaluation (3)
PR: Admission to Phase II. Principles of evaluation applied to advising pupils, diagnosing learning deficiencies, determining effectiveness of instruction and judging pupil progress.

EDTA 306 Learning Theory (3)
PR: Admission to Phase II. Study of applications of learning theory to classroom teaching.

EDTA 307 Teaching Analysis (5)
Initial requirement; an opportunity to examine and participate in general and specific dimensions of teaching with socio-economic factors emphasized. EDTA 205 recommended concurrently.

EDTA 405 Teaching Analysis (4)
PR: Bachelor's degree or consent of instructor. Advanced study, examination, and participation in general and specific dimensions of the teaching task in current American Society.

EDTA 406 Human Development (4)
PR: Bachelor's degree or consent of instructor. Advanced study of basic principles and their application in physical, intellectual, emotional and social development from conception through adolescence.

EDTA 407 Learning Theory (4)
PR: Bachelor's degree or consent of instructor. Analysis and advanced study of the applications of learning theory as applied to teaching in the elementary and secondary classroom.

EDTA 490 Senior Seminar: Education in Human Affairs (2)
Provides an overview of basic objectives, strategies, and techniques in education. This course primarily intended for the senior student is offered as one of the advanced Environmental Studies Seminars. Not open to the student enrolled in the College of Education.

EDTA 601 Social Factors in American Education (3)
PR: Rank III Certificate or Cl. Analysis of general and specific aspects of American education as they relate to Social and Behavioral Sciences.

EDTA 602 Education, Human Development and Learning (3)
PR: Rank III Certificate or Cl. Recent research in Human Development and learning relevant to contemporary American education.

EDTA 603 Measurement and Evaluation in Education (3)
PR: Rank III Certificate or Cl. Rationale and construction of evaluative instruments, parametric and non-parametric statistics, interpretation of data.

EDTA 604 Research Design and Techniques in Education (3)
PR: EDTA 603 or Cl. Design rationales and construction, sampling methods, control and limits.

ELECTRICAL ENGINEERING & COMMUNICATIONS SCIENCES
EECS 311 Switching Theory (3)

EECS 321 Electrical Networks (3)
Continuation of ENGR 322.
EECS 322 Electronic Engineering (4)
Continuation of ENGR 322. Three lectures, three hours laboratory.

PR: ENGR 322. Energy conversion by electromechanical methods.

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

EECS 411 Logical Component Design (3)

EECS 412 Logical Systems Design (4)
PR: EECS 411. Systems investigation, design, and operation of digital computers; Study of a basic hardware set and a basic software set.

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

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

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

EECS 422 Electromagnetic Machinery (3)
PR: EECS 331. Methods and techniques of systems analysis applied to the dynamics of electrical machinery. Two lectures, three hours laboratory.

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

EECS 443 Coherent Optics Applications (3)
PR: EECS 411. Theory and design of coherent optical systems, lasers, information, processing, communications, holography.

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

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

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

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

EECS 464 Solid State Electronics (3)

EECS 496 Special Topics (2-6)
PR: Consent of instructor. May be repeated for credit.

EECS 497 Undergraduate Seminars (2-6)
PR: Consent of instructor. May be repeated for credit.

EECS 499 Independent Study (2-6)
PR: Consent of instructor. May be repeated for credit.

EECS 499 Undergraduate Research (2-6)
PR: Consent of instructor. May be repeated for credit.

ENGINEERING CORE

ENGR 101 Engineering Graphics (3)
Spatial visualization, sketching, and graphical presentation as a form of engineering communication. Engineering drawing, descriptive geometry, manipulation of vectors and graphical solution techniques. Two lectures, one-two hour laboratory.

ENGR 103 Creative Design (3)
PR: Approval of instructor. Role of the engineer as a creative design professional. Emphasis on understanding the creative process and factors that influence it. Attitudes and viewpoints of the designer and an investigation of the techniques of analysis, synthesis, and evaluation used. Two lectures, two hours recitation-laboratory.

ENGR 111 Engineering Concepts (3)
PR: Approval of instructor. Lecture-demonstrations of the basic physical phenomena essential to the understanding of engineering structures, machines, processes, and systems. Primary emphasis on (1) mechanics and materials behavior, (2) electrical phenomena, (3) thermodynamics and kinetics. Two lectures, two hours laboratory-demonstration.

ENGR 151,152 Chemical Foundations of Engineering (3,3)
PR: Sophomore standing and ENGR 102. A discussion of the role of various disciplines in the practice of engineering. Invited guest speakers will review pertinent case studies. Primary emphasis on (1) mechanical engineering-aerospace sciences projects, (2) civil engineering-environmental sciences projects, and (3) electrical engineering-communication sciences projects. Attention will be given to engineering administration, systems, and materials throughout. Two hours lecture discussion.

ENGR 211 Engineering Analysis—Statics (4)
CR: MATH 321. Force systems, resultant, equilibrium, distribution forces. First and second moments of areas and masses.

ENGR 221 Electrical Machines (4)
PR: MATH 321 and ENGR 311. Basic concepts of electricity and magnetism. The development of fundamental laws and their engineering application. Lecture, demonstration, and laboratory.

ENGR 311 Engineering Analysis—Dynamics (4)

ENGR 312 Mechanics of Materials (5)
PR: ENGR 211; CR: MATH 321. Concepts of stress and strain, Hook’s Law; strength and deflection of axial force members, shafts in torsion and beams in flexure; combined stress; stability of columns. Lecture, demonstration and laboratory.

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

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

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

ENGR 331 Thermodynamics (4)

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

ENGR 341 Engineering Economic Analysis (3)
PR: ENGR 221. Economic evaluation of engineering alternatives.

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

ENGR 351 Structure & Properties of Materials (3)
PR: ENGR 152 and MATH 222. Quantum mechanical introduction to atomic bonding. Classification of solids. Crystal structures and the diffraction of X-rays by crystals. Effects of imperfections on physical properties.

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

ENGR 361 Man and His Environment (3)
PR: ENGR 152 or equivalent. Man’s interaction with the air, water, and land environment in which he lives. The role of engineering in control of the physical environment for the benefit of mankind.
ENGR 371 Probability and Statistics for Engineers (3)
PR: MATH 321. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as STAT 335).

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

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

ENGR 442 Operations Research (3)

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

ENGR 471, 472 Engineering Mathematical Analysis (3,3)
PR: MATH 321, MATH 331. The application of mathematical methods to engineering problems including vector and tensor fields, state space techniques, orthogonal curvilinear coordinates and orthogonal functions.

ENGR 473 Analytical Methods in Engineering (3)
PR: ENGR 471 or consent of instructor. The kinematics and dynamics of ideal field theory problems and their mathematical expression. Formulation of boundary conditions. Basic concepts of complex potential and conformal mapping with application to problems in fluid flow, thermal and electric potential.

ENGR 474 Analytical Methods in Engineering (3)
PR: ENGR 471 or consent of instructor. Engineering applications of partial differential equations and the concept of the mathematical modeling of physical problems. Development of characteristic properties of equations and methods of solutions including separation of variables, transform techniques and method of characteristics.

ENGR 475 Numerical Analysis in Engineering (3)
PR: MATH 321, MATH 331. Application of numerical techniques to the solution of complex engineering problems. Analysis and organization of practical programs for numerical solution of initial, boundary and eigenvalue problems.

INTERDISCIPLINARY COURSES

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

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

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

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

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

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

ENGR 487 Historical Architecture (3)
Architecture as the realization of changing aesthetic and cultural ideals and the expression of changing forms of society. Development of understanding of our physical environment through a study of the forms, relationships of and development of architecture.

ENGR 490 Engineering in Human Affairs (2)
The impact of engineering on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies Seminars. Not open to students majoring in the College of Engineering.

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

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

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

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

ENGINEERING MATERIALS SCIENCES

EMS 411 Semiconductor Materials and Devices (3)
PR: ENGR 323 and ENGR 351. Electrical conduction in semiconductors; basic concepts of drift, diffusion, carrier generation and recombination. Physical theory and models for the junction diode and transistor. Representation in terms of linear incremental and non-linear charge control models.

EMS 412 Electronic Properties of Materials (3)

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

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

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

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

EMS 441 Materials Processing (3)
PR: ENGR 351. Phase transformations, crystallography, growth processes, kinetics of solid state transformations; technology of high and low temperatures, vacuum systems, high pressure, and clean environments.

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

EMS 452 Engineering Materials (3)

EMS 496 Special Topics (2-6)
PR: Consent of instructor. May be repeated for credit.

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

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

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

ENGLISH

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

ENG 102 Composition II (3)
PR: ENG 101 or equivalent. Writing practice involving the mechanics of
ENG 101, 102 and 103 may be taken to satisfy the State Department requirement for certification in secondary school teaching or to transfer to colleges that require one full year of Freshman English. Students who intend to major in English, English Education, or Library Science must take ENG 101, 102 and 103, and must complete ENG 210 before enrolling in any English courses numbered above 210 with the exception of ENG 201.

ENG 210 Principles of Literature (3)

Literary terms, forms, and types, illustrated in a wide variety of readings.

ENG 211 Survey of English Literature to 1625 (3)

ENG 212 Survey of English Literature, 1626-1798 (3)

ENG 213 Survey of English Literature, 1798-1914 (3)

ENG 300 Expository Writing (3)

Training in advanced composition, primarily intended for students in the College of Education. Theory and practice of the several forms and applications of expository writing.

ENG 301 Professional Report Writing (3)

For scientific, professional, or business students. The first half of the course lays emphasis upon clear expository writing with particular attention to business letters and memoranda. The second half of the course stresses the production of professional reports or articles in the student's particular discipline.

ENG 302 Creative Writing Workshop I (3)

PR: Permission of instructor. Intensive practice in the essential tools of writing, applicable to more advanced work in non-fiction, fiction, poetry, and drama.

ENG 303 Creative Writing Workshop II (3)

PR: ENG 302 or approval of instructor. Analytic study of the work of established writers; practice in producing short forms of fiction or non-fiction. (May be repeated once for credit.)

ENG 304 Creative Writing Workshop III (3)

PR: ENG 302 or approval of Instructor. Analytic study of the work of established poets; practice in producing original verse in both traditional and modern forms.

ENG 311 Survey of American Literature, 1898-1865 (3)

ENG 312 Survey of American Literature, 1865-1914 (3)

ENG 313 Survey of American Literature Since 1914 (3)

ENG 314 Survey of British Literature Since 1914 (3)

ENG 316 Continental European Fiction Since 1900 (3)

A selection of significant works of fiction written in various languages during the present century, read in translation.

ENG 321 Exploring Poetry (3)

A broad, cultural approach to poetry, with emphasis upon the major themes and preoccupations of poets of all ages.

ENG 361 Practical Criticism (3)

Student evaluation of selected fiction, poetry, and drama through practical exercises in literary criticism.

ENG 371 Principles of Linguistics (3)

Basic linguistic concepts and an introduction to historical, descriptive, comparative, and applied linguistics. Recommended for students in Secondary Education as well as majors in English.

ENG 401 Senior Writing Workshop I (3)

PR: Evidence of writing skill satisfactory to the instructor. Analysis of significant non-fiction; market research; intensive writing practice leading to a completed body of fiction writing suitable for publication. Should be taken in conjunction with ENG 498. (May be repeated once for credit).

ENG 402 Senior Writing Workshop II (3)

PR: Evidence of writing skill satisfactory to the instructor. Analysis of significant fiction; market research; intensive writing practice leading to a completed body of non-fiction writing suitable for publication. Should be taken in conjunction with ENG 498. (May be repeated once for credit).

ENG 403 Senior Writing Workshop III (3)

PR: Evidence of writing skill satisfactory to the instructor. Analysis of significant poetry; market analysis; intensive writing practice leading to a completed body of verse suitable for publication. Should be taken in conjunction with ENG 498. (May be repeated once for credit).

ENG 404 English Versification (3)

Intensive study of the structural characteristics of English poetry, metrical systems, rhyme, stanza, and poetic rhetorical devices.

ENG 410 Contributions of Minority Groups to American Literature (3)

Contributions of linguistic and ethnic groups of non-English origin to the literature of the United States.

ENG 421 Studies in 17th Century English Literature I (3)

Early prose, poetry, and drama (exclusive of Shakespeare).

ENG 422 Studies in 17th Century English Literature II (3)

Literature of the Puritan domination.

ENG 423 Studies in 17th Century English Literature III (3)

Literature of the Restoration period.

ENG 424 Studies in 18th Century English Literature I (3)

Selected works of writers of the first 40 years of the 18th Century.

ENG 425 Studies in 18th Century English Literature II (3)

The rise of the English novel and the "Age of Johnson."

ENG 426 Studies in 18th Century English Literature III (3)

Early romanticism; the Gothic novel and the novel of manners; the drama of the 18th Century.

ENG 427 Studies in 19th Century English Literature I (3)

English literature from 1798-1832: the Romantic Triumph in poetry and prose.

ENG 428 Studies in 19th Century English Literature II (3)

English literature from 1832 to 1870: the early Victorians.

ENG 429 Studies in 19th Century English Literature III (3)

English literature from 1870 to 1914: later Victorians and transitional writers.

ENG 430 Chaucer (3)

The Canterbury Tales, Troilus and Criseyde, and other works.

ENG 431 Shakespeare's Comedies (3)

ENG 432 Shakespeare's Histories (3)

ENG 433 Shakespeare's Tragedies (3)

ENG 434 Milton (3)

Paradise Lost, Paradise Regained, Samson Agonistes, shorter poems, and selected prose.

ENG 441 English Drama to 1642 (exclusive of Shakespeare) (3)

ENG 442 Restoration and 18th Century English Drama (3)

ENG 444 The British Novel in the 18th Century (3)

ENG 445 The British Novel in the 19th Century (3)

ENG 446 The American Novel in the 19th Century (3)

ENG 451 British and American Fiction Since 1900 (3)

ENG 452 British and American Poetry Since 1900 (3)

ENG 453 British and American Drama Since 1900 (3)

ENG 460 Historical Survey of Literary Criticism (3)

Study of the major critics from classical antiquity through the modern era.

ENG 461 British Literary Criticism to 1900 (3)

PR: ENG 460. Study of the major critics in England from the Renaissance through the Victorian period.

ENG 462 British Literary Criticism Since 1900 (3)

PR: ENG 460. Study of the important critical theories and principles developed in England from the Edwardian era to the present.

ENG 463 Literary Criticism in the United States (3)

PR: ENG 460. Study of American literary critics to the present.

ENG 465 Literature for Adolescents (3)

Selecting and evaluating books for adolescents, with emphasis on the uses of books in the development of young people. Required for secondary school English teachers and students seeking certification in Library Sciences.
ENVIRONMENTAL STUDIES PHYSICAL EDUCATION

The Environmental Studies Physical Education Elective Program is designed to enhance the physical and mental development of the student. A student may receive three quarter hours credit towards graduation by enrolling and satisfactorily completing any one of the following courses:

- **ESPE 301 Aquatics (3)**
  A study and application of the physiological benefits of basic aquatic developmental skills: elementary and advanced strokes, water safety, springboard diving, and interval training. (2 hours lecture; 2 hours activity)

- **ESPE 302 Body Development (M) (3) or ESPE 303 Body Development (W) (3)**
  A study and application of the metabolic, neuromuscular, and cardiovascular changes resulting from select physical activities. (2 hours lecture; 2 hours activity)

- **ESPE 304 Golf (3)**
  A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity. (2 hours lecture; 2 hours activity)

- **ESPE 305 Tennis (3)**
  A study of performance and application in basic and advanced skills, rules, and etiquette. Physiological and social values accruing from this carry-over activity. (2 hours lecture; 2 hours activity)

- **ESPE 306 Life Saving (3)**
  Instruction, training and certification in basic life saving swimming skills. (2 hours lecture; 2 hours activity)

- **ESPE 307 Scuba Diving (3)**
  Instruction, training and certification in basic diving skills with self-contained underwater breathing apparatus. Students may be required to supply their own equipment. (2 hours lecture; 2 hours activity)

- **ESPE 308 Interpretive Dance (3)**
  Instruction and analysis of creative dance performance as an art form. (2 hours lecture; 2 hours activity)

FINANCE

- **FIN 341 Real Estate (3)**
  PR: Junior standing. Basic principles of real estate ownership, its use and transfer, brokerage, management, legislation, and importance to the economy.

- **FIN 601 Capital Budgeting and Financial Planning (3)**
  PR: Graduate standing. Financial planning and forecasting, sources of long-term capital, concepts of the cost of capital, and capital budgeting.

FRENCH

- **FRE 101 Elementary French Language and Civilization (3)**
  Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to French culture.

- **FRE 202 Intermediate French Language and Civilization (3)**
  PR: FRE 101 or equivalent. Continuation of FRE 201.

- **FRE 301 French Composition (4)**
  PR: FRE 203 or equivalent. Development of composition skills in French including parts of speech, sentence structure, and composition of paragraphs.

- **FRE 401 French Phonetics and Diction (2)**
  PR: FRE 203 or equivalent. Development of skills in pronunciation and performance of works of French authors.

- **FRE 422 Seventeenth Century French Theater (5)**
  PR: FRE 312. Comedies by Racine and Moliere. A study of the life and principal works of the authors.
HIST 461 Medieval British History: Earliest Times to 1485 (3)
HIST 462 Modern British History: 1485-1815 (3)
HIST 463 Modern British History: 1815 to the Present (3)
HIST 464 British Empire and Commonwealth (3)
The development of the British Empire and Commonwealth since the
American Revolution.
HIST 466 British History: Tudor-Stuart Period (3)
A study of the Tudor-Stuart period, with particular emphasis on the
civil-religious conflicts of the time.
HIST 470 History of Russia to 1856 (3)
HIST 471 History of Russia: 1856-1917 (3)
HIST 472 History of the Soviet Union: 1917 to the Present (3)
HIST 497 Undergraduate Seminar (2-6)
PR: Consent of instructor. May be repeated for credit.
HIST 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.
HIST 499 Undergraduate Research (2-6)
PR: Consent of instructor. May be repeated for credit.

HUMANITIES

HUM 301 Western Humanities I (3)
The Greco-Roman world and the early Middle Ages.
HUM 302 Western Humanities II (3)
PR: HUM 301. The high Middle Ages, the Renaissance, and the early
Baroque period.
HUM 303 Western Humanities III (3)
PR: HUM 302. The modern world, from the age of the Enlightenment to
the contemporary period.
HUM 311 Egypt and the Near East (3)
The life and thought of ancient civilizations as revealed through art and
archaeology.
HUM 315 China and Japan (3)
The art, literature, and thought, as related to religion and custom, during
periods of highest achievement.
HUM 317 India and Indonesia (3)
The cultural traditions and the principal monuments in art and literature.
HUM 319 Russia (3)
Outstanding examples of Russian music, dance, drama, and fiction, with
attention to the distinctive mixture of cultural influences they reveal.
HUM 335 Afro-American Culture (3)
The artistic influence of the Negro in America.
HUM 351 Latin-American Cultures (3)
The art and archaeological remains of Inca, Mayan, and Aztec civilizations;
their influence on Latin-American music, art and literature.
HUM 355 American Ideas I (3)
A history of ideas course using the American Studies approach and
emphasizing the significance of Puritanism, capitalism, nationalism, and
the idea of progress in the development of American ideals.
HUM 356 American Ideas II (3)
Continuation of HUM 355 with emphasis on the effect of Industrialism,
pragmatism, individualism, and the cycles of reform and reaction.
HUM 371 Contemporary American Culture (3)
An integrated view of the art, music, and literature of our time, revealing
the impact of depersonalization, alienation, revolt, and the search for
self-awareness.
HUM 411 The Classical Temper (3)
An exploration of the meaning of "classical" in architecture, music,
painting, sculpture and literature, with attention to various revivals of the
style.
HUM 413 The Romantic Mood (3)
A comparative study of selected romantic art works in various periods and
places, including modern America.
HUM 416 Realism, Naturalism, and Impressionism (3)
A definition and comparison of these terms as related to various art forms
and as seen in selected works from Chaucer to the present.

HUM 421 Purposes of Art I (3)
The variety and evolution of visual arts used for religious purposes from
primitive times to modern.
HUM 422 Purposes of Art II (3)
Visual art for non-religious purposes: as a reflection of nature, of
authority, of imagination.
HUM 441 Purposes of Music (3)
Religious and social functions of music and its relationships with other
arts.
HUM 451 The Epic (3)
The epic hero as a model of human ideals in various cultural settings.
HUM 455 The Tragic View (3)
A study of tragedy as an archetype of human experience and a view of life:
examples from the literature of Greece, Rome, France, England and
Amercia.
HUM 458 The Comic View (3)
A definition of the comic and satiric views of life and a study of examples
in literature from Aristophanes to Ionesco.
HUM 471 Mythic Literature (3)
A comparative study of the significance of myth in the evolution of folk
traditions: Oriental, Near Eastern, Greek, Scandinavian, American.
HUM 473 Confession Literature (3)
A comparative study of works offering insight into the minds and personal
lives of influential thinkers from St. Augustine to the present.
HUM 491 Humanities Forum (2)
An elective and open discussion, with variable content, for students in all
areas of the University. A selected topic will be discussed each week in a
two-hour session.
HUM 496 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.
HUM 497 Undergraduate Seminar (2-5)
PR: Consent of instructor. May be repeated for credit.
HUM 498 Independent Study (2-5)
PR: Consent of instructor. May be repeated for credit.

HUMANITIES AND SOCIAL SCIENCES

HSS 490 Senior Seminar: Arts and Social Sciences in Human Affairs (2)
The contemporary world as viewed distinctively by the various disciplines
represented in the College of Humanities and Social Sciences. Students
may choose the section offered by any one of several departments. This
course, primarily intended for the senior student, is offered as one of the
Advanced Environmental Studies seminars. Not open to the students in
the College of Humanities and Social Sciences.

INDUSTRIAL ENGINEERING & MANAGEMENT SYSTEMS

IEMS 311 Engineering Law (3)
PR: Junior standing. Influence of contract, property, and tort law upon
engineering activities: contracts, agency, partnerships, corporations, liens,
and expert testimony.
IEMS 331 Work Analysis and Design (3)
PR: Junior standing or approval of instructor. Analysis, design and
operation of work systems; their relationship to job evaluation and wage
payment systems. Laboratory assignments.
IEMS 332 Statistical Quality Control (3)
Statistical concepts and methods applied to the control of quality of
manufactured products. (Same as STAT 332).
IEMS 351 Engineering Applications of Computer Methods (3)
PR: MATH 223, COMP 102 or approval of Instructor. Methods of
structuring engineering problems for computers; general characteristics and
performance measures of computers and auxiliary equipment. Intro­
duction to computer-aided design and time-sharing systems, case studies.
Laboratory assignments.
IEMS 411 Industrial Administration (3)
PR: ENGR 442. Role of the engineer in manufacturing management.
Basic functions, departmentation, authority relationships, and methods of
control.
IEMS 421 Operations Research Models (3)
PR: ENGR 471. Inventory and replacement models, queueing theory,
sequencing, forecasting, dynamic programming.
**LIBRARY SCIENCE**

**LIB 301 Library Materials (3)**
A general introduction to the selection, acquisition, processing, and use of all types of library materials.

**LIB 321 Library Organization and Administration I (3)**
Principles and practices of library organization and administration as applied to all types of libraries, including personnel, financial support, organization and servicing of the collection, planning and equipping libraries, planning and evaluating services.

**BULLETIN**

**JRN 322 Information Processing (3)**
Planning content and format of newspapers and other periodicals; layout, dummying, departmental editing, copy desk management.

**JRN 330 History of Journalism (3)**
Development of newspapers and magazines, the press associations and the growth of the electronic media.

**JRN 331 Film Criticism (3)**
PR: Consent of instructor. The practice of writing movie reviews; students will review at least one film a week during the course.

**JRN 428 News Writing (3)**
PR: Consent of instructor and student must have a minimum ability to type. Development of skills in gathering and writing for the mass media.

**JRN 421 Editorial and Column Writing (3)**
PR: Consent of Instructor. Building the editorial page, backgrounding and interpreting the news.

**JRN 423 Writing for the Mass Media (3)**
PR: Consent of instructor. Students write for a certain segment of the mass media of their own choosing. Will include playwriting, creative writing, article writing, etc.

**JRN 424 Critical Writing (3)**
PR: Consent of instructor. Practice in writing reviews of plays, concerts, and books.

**JRN 425 Feature Writing (3)**
PR: Consent of instructor. Writing of feature articles for newspapers and magazines.

**JRN 426 Public Relations (3)**
Principles and practice of public relations, the means of gaining publicity and influencing people.

**JRN 427 Public Relations Campaigns (3)**
The planning and execution of a public relations campaign; use of research and coordination of elements of the campaign.

**JRN 431 International Communications and the Foreign Press (3)**
A study of the news communication systems of the world, the role of foreign correspondents, the foreign press.

**JRN 432 The Mass Media in Developing Countries (3)**
Role of the media in the developing areas of the world, how the nations and media help shape the direction of one another.

**JRN 433 Propaganda and Psychological Warfare (3)**
Propaganda and psychological warfare principles with a study of the activities engaged in by nations.

**JRN 434 Principles of Advertising (3)**
Fundamentals of advertising theory and practice including social and economic aspects.

**JRN 435 Advertising Media (3)**
PR: JRN 434 or consent of instructor. Evaluations of advertising media in terms of their ability to serve the advertiser’s communication needs and the tools of analysis used in determining media success.

**JRN 436 Advertising Copy (3)**
PR: Consent of Instructor. The writing and preparation of copy for advertisements.

**JRN 437 Advertising Campaigns (3)**
PR: JRN 436 or consent of instructor. The planning and execution of an advertising campaign; use of research and coordination of elements of the campaign.

**JRN 496 Special Topics (2-5)**
PR: Consent of Instructor. May be repeated for credit.

**JRN 498 Independent Study (2-6)**
PR: Consent of Instructor. May be repeated for credit.

**INHALATION THERAPY**

Course offerings in Inhalation Therapy, INHT, will be published as a supplement to this Bulletin.

**JOURNALISM**

**JRN 320 Press Photography (3)**
Learning the use of the still camera, darkroom procedures, role of the photographer.

**JRN 321 Copy Editing (3)**
Fundamental of copy editing for printed media, including selection, processing and display of news.
LIB 322 Library Organization and Administration II (3)
PR: LIB 321 or equivalent. Continuation of LIB 321.

LIB 334 Selection and Acquisition of Library Materials (3)

LIB 384 History of Books and Libraries (3)
A history of books and libraries from ancient times to the present, in relation to the society of which they were a part.

LIB 424 School Library Administration (3)
PR: LIB 322. Principles and practices of library administration applied to elementary and secondary school libraries.

LIB 431 Cataloging and Classification I (3)
PR: LIB 321. Introduction to the theory and practice of cataloging and classifying library materials. Practical problems in descriptive cataloging, subject cataloging and Dewey Decimal classification as practiced in small libraries.

LIB 432 Cataloging and Classification II (3)
Additional study in the theory and practice of cataloging and classification. Introduction to Library of Congress classification and subject headings, divided and classified catalog and filing rules.

LIB 444 Reference Materials and Services (3)
Selection, evaluation, and use of basic reference materials, with emphasis on functions and services of a reference department.

LIB 451 Introduction to Educational Media (4)
Principles and practices of communication theory and its application in the classroom; selection, evaluation, acquisition, storage, and use of non-book materials and related equipment; organizing audio-visual services.

LIB 452 Preparation and Production of Instructional Media (3)
Selection, evaluation, and production of instructional materials with emphasis on production of projected materials; display and presentation techniques.

MANAGEMENT

MGMT 301 Management (5)
PR: ECON 203. Fundamentals of management underlying the solution of problems relating to the organization and operation of business enterprises.

MGMT 324 Production Management (5)
PR: MGMT 301. Principles and methods of production viewed from a managerial decision-making level.

MGMT 344 Organization Theory (5)
PR: MGMT 301. Elements in organizations and the processes by which they develop and influence behavior are considered.

MGMT 347 Human Relations in Management (3)
PR: MGMT 344. The individual, interpersonal and group relations and inter-group and organizational problems in business.

MGMT 364 Personnel Management (5)
PR: MGMT 301. An investigation of personnel practices and interpersonal relationships involved in managing employees. Internal problems of labor control and the utilization of human resources are considered.

MGMT 367 Industrial Relations (3)
PR: MGMT 301. The impact of trade unionism on industrial relations; current problems, conflicts and trends; the development of managerial approaches to achieve labor-management cooperation.

MGMT 424 Production Management Problems (3)
PR: MGMT 324. Problems in the management of industrial enterprises. Management principles and mathematical analysis applied to manufacturing; product development and production; materials and production control; employee relations.

MGMT 464 Personnel Problems (3)
PR: MGMT 394. Case studies in personnel problems directed toward the application of personnel management theory and concepts to organization problems.

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

*May not be offered before 1971.

MGMT 601 Management Process (3)
PR: Graduate standing. Theory of management for complex organizations.

MGMT 611 Organizational Behavior (3)
PR: Graduate standing. The relationship of human behavior to organizational performance, including motivation, leadership, organizational environment, social environment and communication.

MARKETING

MKTG 301 Marketing (5)
PR: ECON 203. Study of functions, institutions and basic problems in marketing of goods and services in our economy.

MKTG 324 Marketing Environment (3)
PR: MKTG 301. The nature of marketing decisions and pricing; marketing organization and the pricing process; price theories and pricing models.

MKTG 344 Marketing Logistics (3)
PR: MKTG 301 and ECON 321 or BADM 311. The ecology, analysis and development of integrated distribution systems; the application of quantitative tools, economic analysis, transportation and marketing management in the analysis and interpretation of the design and physical flow of goods through marketing network alternatives.

MKTG 364 Advertising Management (3)
PR: MKTG 301. Analysis of field of advertising; purposes, techniques, media, organization, and role of research; economic and social aspects of advertising.

*May not be offered before 1971.

MKTG 367 Sales Management (3)
PR: MKTG 301. Problems confronting sales manager; training in sales techniques; sales objectives and policies; organization; and administration of sales force.

MKTG 384 Marketing Research (5)
PR: MKTG 301 and ECON 321. Study of research procedures and techniques applicable to problem solving in marketing. The marketing management process is analyzed; the underlying concepts related to the information needed, to serve the processes are explored; and the incorporation of information resources into the management function is demonstrated.

MKTG 469 Advertising and Sales Management (3)
PR: MKTG 394, MKTG 367, and PSY 308. Managerial approach to advertising and sales management. Designed to acquaint the student with the methods of demand analysis and its application to the interrelationship to marketing management, advertising management, and sales management.

MKTG 495 Marketing Policies and Strategies (3)
PR: MKTG 384 and MKTG 469. Marketing problems and policies are explored with emphasis placed on the decision-making process.

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

MKTG 601 Marketing Policy (3)
PR: Graduate standing. Marketing policy formulation and decision-making with respect to planning, pricing, promoting, and distributing.

MATHEMATICS

MATH 100 Principles of Mathematics (4)
PR: Two years of high school mathematics. A study of some topics in mathematics with primary emphasis on developing conceptual understanding and broadening insights into mathematics. Designed specifically for use in the Environmental Studies Program.

MATH 104 Elementary Mathematics (3)
PR: Two years of high school mathematics. Properties of numbers; factoring; fractions; solution of linear and quadratic equations; systems of equations; graphing; problem solving. For those students whose preparation in mathematics is insufficient for MATH 105, 108 or 115.

*May not be offered before 1971.
MATH 106 College Algebra (3)
PR: MATH 104 or three years of high school mathematics including two in algebra. Algebraic and transcendental functions; sequences; inequalities; determinants; permutations; combinations; mathematical induction; partial fractions.

MATH 108 Analytic Trigonometry (3)
PR: MATH 104 or two years of high school algebra, and one year of high school plane geometry. The circular functions and their identities; inverse circular functions; equations and inequalities involving circular functions; graphs of the circular functions and their inverses; functions of angles; complex numbers.

MATH 110 Elementary Functions (5)
PR: Two years of high school algebra and one year of plane geometry and one half year of trigonometry. Properties of algebraic and transcendental functions; inequalities and related topics.

MATH 116 Finite Mathematics (6)
PR: MATH 104 or one and one half years of high school algebra and one year of plane geometry or two years of high school algebra. Mathematical logic, set theory, counting and the binomial theorem, probability.

MATH 198 Freshman Seminar (3)
PR: Consent of instructor. This course develops the student's ability to analyze and solve logical and mathematical problems by careful analysis of selected problems. (Required of all majors in the Mathematical Sciences.)

MATH 221,222,223 Calculus with Analytic Geometry (4,5,6)
PR: MATH 110, or MATH 106 and 108, or the equivalent. Analytic geometry; functions; limits; continuity; derivatives; antiderivatives; definite integrals; calculus of transcendental functions; techniques of integration; indeterminate forms; vectors.

MATH 314 Boolean Algebra (4)
PR: MATH 223 or consent of instructor. Axiomatic development of Boolean algebra; the sets of logic and circuits as Boolean algebras.

MATH 316,316 Introduction to Number Theory (3,3)
PR: Consent of instructor. Divisibility; primes and composites; divisors; Euclid's algorithm; Diophantine equations; modulo arithmetic; simple continued fractions. Intended for prospective teachers of mathematics.

MATH 317 Matrices (3)
PR: MATH 223. Elementary properties of matrices; special real and complex matrices; determinants and inverses; rank and systems of equations; transformations; eigenvalues; diagonalization; quadratic forms.

MATH 318,319 Linear Algebra (3,3)
PR: MATH 223. A detailed analysis of finite dimensional linear spaces including bases, subspaces, dual spaces, quadratic forms, and applications to geometry.

MATH 321 Intermediate Calculus and Analytic Geometry (5)
PR: MATH 223. Solid analytic geometry; functions of several variables; partial derivatives; infinite sequences and series; vector calculus; line and surface integrals; multiple integrals.

MATH 321 Differential Equations (4)
PR: MATH 321. First order ordinary differential equations; equations with constant coefficients; the method of variation of parameters; step-by-step integration; reduction of order; Picard's method, the method of Frobenius; introduction to input-output analysis and transform methods.

MATH 341 Vector Analysis (3)
PR: MATH 321. Scalar and vector products; limits, derivatives and integrals of vector valued functions of real vectors; the directional derivative and vector operations; the theorems of Green, Gauss and Stokes; generalized curvilinear coordinates; applications in engineering and physical sciences.

MATH 361,362 Foundations of Geometry (3,3)
PR: Consent of instructor. Euclidean geometry; geometry of transformations, projective and other non-Euclidean geometries.

MATH 411,412,413 Algebraic Structures (3,3,3)
PR: MATH 223. An introduction to the properties of groups, rings, polynomial rings, integral domains and fields.

MATH 414 Semi-groups and Groups (3)
PR: Consent of instructor. An axiomatic development of basic properties of semi-groups and groups.

MATH 420 Sequences and Series (3)
PR: Consent of instructor. Convergence of infinite sequences and series; double series; infinite products. Intended for prospective teachers of mathematics.

MATH 421,422,423 Advanced Calculus (3,3,3)
PR: MATH 321. Limits, sequences and concepts of continuity; differentiation; and integration; derivatives of integrals; infinite series and concepts of convergence; the Bolzano - Weierstrass theorem and the Heine-Borel theorem; extensions in Euclidean n-space.

MATH 424 Lebesgue Theory (3)
PR: MATH 423. Inner and outer measure; measurable sets and functions; the Lebesgue integral.

MATH 425 Techniques of Complex Variables (3)
PR: MATH 321. Analytic functions; integration in the complex plane; Laurent series and residue calculus; inversion of Laplace transforms; conformal mappings; applications in engineering and the physical sciences.

MATH 426,427 Theory of Complex Variables (3,3)
PR: MATH 425. Analytic and harmonic functions; Cauchy's theorem and its implications; the maximum modulus principle; series expansions; decomposition of meromorphic functions into partial fractions; analytic continuation; asymptotic expansions; the Mittag-Leffler Theorem; integral functions of finite order; Riemann surfaces.

MATH 428 The Number System (3)
PR: MATH 420. An axiomatic development of the natural numbers followed by a constructive development of the real and complex numbers. Intended for prospective teachers of mathematics.

MATH 429 Foundations of Calculus (3)
PR: MATH 420. Functions; limits; continuity; differentiation and integration. This course is a study of the basic structure of the calculus and is recommended for prospective teachers of mathematics.

MATH 431 Ordinary Differential Equations (3)
PR: MATH 321. Systems of equations; the Wronskian; Abel's identity; integrating factors and adjoint equations.

MATH 432 Theory of Differential Equations (3)
PR: MATH 321. Existence and uniqueness of solutions; oscillation theory; asymptotic solutions; stability.

MATH 434 Partial Differential Equations (3)
PR: MATH 331. Separation of variables; orthogonality and Fourier series; classification of equations; solutions in different coordinate systems; methods of characteristics; the Fourier integral transform and Dirac's delta function.

MATH 435 Boundary Value Problems (3)
PR: MATH 434. Adjoint forms and Green's functions; applications in engineering and the physical sciences.

MATH 436 Special Functions (3)
PR: MATH 331. Special functions represented as series, products and integrals; generating functions and recurrence formulas; orthogonal expansions and interrelations between special functions. Emphasis will be on the Bessel, Legendre, gamma and hypergeometric functions with an introduction to other polynomial sets.

MATH 437 Laplace Transforms (3)
PR: MATH 331. The Laplace and Z transforms; solutions of ordinary and partial differential equations; application to circuit analysis and difference equations.

MATH 438 Transform Calculus (3)
PR: MATH 331. Fourier, Hankel and other transforms with applications to physical problems; the transformations of distributions.

MATH 461 Basic Topology (3)
PR: MATH 421 or 428. Compactness; connectedness; general metric spaces; topological spaces; limit points.

MATH 462 Concepts in Topology (3)
PR: MATH 461. Topology of surfaces, Euler characteristic; spheres with handles and crosscaps; algebraic invariants; combinatorial topology.

MATH 480 History of Mathematics (3)

MATH 491 Contemporary Mathematics (3)
PR: Consent of the instructor. Concepts, problems, and advanced topics included in current approaches to secondary mathematics. (Same as EDSE 493.)

MATH 496 Special Topics (2-6)
PR: Consent of the instructor. May be repeated for credit.

MATH 497 Undergraduate Seminar (2-6)
PR: Consent of the instructor. May be repeated for credit.
MATH 498 Independent Study (2-6)  
PR: Consent of the instructor. May be repeated for credit.

MATH 499 Undergraduate Research (2-6)  
PR: Consent of the instructor. May be repeated for credit.

MECHANICAL ENGINEERING & AEROSPACE SCIENCES

MEAS 341 Mechanics (2)  
PR: ENGR 311. Relative motions of machine parts; cams, rolling contact, gearing, and flexible connectors. Synthesis of mechanisms. One lecture, three hours laboratory.

MEAS 343 Dynamics in Design (2)  
PR: MEAS 341. Experimental mechanics; dynamic measurements; applications of dynamics in design.

MEAS 351 Measurement Systems Engineering (3)  
PR: ENGR 312 and 322. Application of system design concepts to measurements. Fundamental theory of static and dynamic measurements. Behavior of transducers individually and in open-loop systems. Validation of experimental data. Measurements are considered as information transfer accompanied by energy transfer. Two lectures, one laboratory lecture, two hours laboratory bi-weekly.

MEAS 371 Fluid Mechanics (3)  
PR: ENGR 332. Continuation of ENGR 332. Topics in gas dynamics including shock waves, viscous flow analysis and solutions in boundary layer theory.

MEAS 372 Thermodynamics of Mechanical Systems (3)  
PR: ENGR 331. Applied thermodynamics; gas mixtures, power cycles, and reactive systems.

MEAS 411 Aerodynamics (3)  
PR: ENGR 312. Principles of subsonic and supersonic flight; airfoils in compressible and incompressible flow; flow about a body; thin airfoil and finite airfoil theory.

MEAS 413 Stability and Control (3)  
PR: MEAS 411. Application of elementary aerodynamic principles to static and dynamic stability and control surface theory.

MEAS 421 Space Mechanics (3)  
PR: ENGR 311. Dynamics with applications to aeronautical and astronautical problems, orbits and trajectories, motion in a resisting medium, performance and optimization of multi-stage rockets.

MEAS 423 Vibration Analysis (3)  

MEAS 424 Flight Vehicle Structures (3)  
PR: CEEES 351. Space structures; thin-walled structures; load factors; non-symmetrical bending and transverse shear; shear center and shear flow; semi-monocoque construction, fuselage rings; multi-cellular structures; sandwich panels, fatigue.

MEAS 432 Propulsion Systems (3)  
PR: MEAS 372. Analysis of jet propulsion systems including turbojets, ramjets, and rockets.

MEAS 436 Mechanical Power Systems (3)  
PR: MEAS 372. Analysis and design of large power generating systems and components thereof with emphasis on steam plants utilizing both chemical and nuclear fuels. Boiler, turbine, condenser, and auxiliary equipment design and performance analysis.

MEAS 437 Energy Conversion (3)  
PR: MEAS 372 and PHYS 344. Unconventional methods of energy conversion; particular emphasis on fuel cells, thermo-electrics, thermionics, solar energy, photovoltaics, nuclear, and magnetohydrodynamics.

MEAS 441 Principles of Design (3)  
PR: MEAS 342. Design Procedures; force and motion analysis; failure modes; stress and deflection analysis; stress concentration; fatigue; selected components.

MEAS 451 Measurement Systems (3)  
PR: MEAS 351. Extension of fundamental measurement principles; discussion of DC, sine wave and pulse carrier systems and of unbalance and reference-balance measuring methods; simple computing-type transducers. Two lectures, two hours lecture-laboratory.

MEAS 471 Statistical Thermodynamics (3)  

MEAS 472,473 Heat Transfer (3)  

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

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

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

MEAS 499 Undergraduate Research (2-6)  
PR: Consent of instructor. May be repeated for credit.

MEDICAL TECHNOLOGY

Course offerings in Medical Technology, MEDT, will be published as a supplement to this Bulletin.

MEDICAL RECORDS SCIENCE

Course offerings in Medical Records Science, MRSC, will be published as a supplement to this Bulletin.

MICROBIOLOGY

MICR 200 General Microbiology (3)  
PR: 8 hours in biological sciences. Fundamentals of microbiology, morphology, metabolism.

MICR 201 General Microbiology Laboratory (1)  
Laboratory procedures and principles in microbiology; taken concurrently with MICR 200.

MICR 210 Culture Media and Reagents (2)  
PR: MICR 200. Preparation of differential, selective, and enrichment media; reagents used in microbiology.

MICR 220 Sanitary Science and Public Health (3)  
PR: BIOL 100. Theories of disease; sanitary procedures in water purification; sewage disposal, refuse collection; milk supplies; swimming pools; air contamination; personal and public health.

MICR 290 Advanced General Microbiology (4)  
PR: MICR 200. Advanced fundamental theory and technique.

MICR 290 Pathogenic Microbiology (4)  
PR: MICR 200. Microorganisms producing disease in man and other animals; means of transmission; protection against disease.

MICR 322 Microbiology of Water and Sewage (4)  
PR: MICR 200. Organisms in water and their relationship to production and distribution of potable water; disposal of sewage.

MICR 350 Soil Microbiology (4)  
PR: MICR 200. Soil microorganisms and their role in ammoinification, nitrification, and biological processes.

MICR 430 Microbial Physiology (4)  
PR: MICR 300. Relationship between structure and function in microorganisms.

MICR 440 Determinative Microbiology (4)  

MICR 470 Virology (4)  
PR: 12 hours of microbiology and CHEM 123. Nature of viruses and Rickettsiae including their structure, propagation, isolation, and identification.

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

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

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

MICR 499 Undergraduate Research (2-6)  
PR: Consent of instructor. May be repeated for credit.
MUSIC Courses are classified as follows:


FEES: Each course involving private lessons has a music fee of $12.50 per quarter hour credit. Class Piano MUS 111 has no music fee.

MUS 101,102,103 Music Theory (3,3,3)
The fundamental course in basic musicianship integrating the various musical skills with the development of the student's musical perception and understanding. Required of all music majors.

MUS 104,105,106 Music Literature (2,2,2)
Analysis and dissection of important musical works, Baroque to contemporary periods, introduction to stylistic differences of the various musical eras. Primarily for music majors.

MUS 111 Class Piano (2)
May be repeated for credit.

MUS 112 Voice (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 113 String (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 114 Woodwind (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 116 Brass (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 118 Percussion (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 117 Organ (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 118 Piano (1)
One half-hour private instruction per week. May be repeated for credit.

MUS 201,202,203 Music Theory (3,3,3)
PR: MUS 103 or equivalent. Continuation of course content of MUS 101 through 103 integrated with intensive training in aural comprehension.

MUS 211 Piano (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 212 Voice (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 213 String (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 214 Woodwind (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 215 Brass (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 216 Percussion (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 217 Organ (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 218,219,220 Piano Literature (2,2,2)
PR: Proficiency in an applied instrument or voice (200 level or above) or consent of instructor. Survey of stringed keyboard literature from the sixteenth century to the present with emphasis on technical, formal and performance problems.

MUS 221,222,223 Song Literature (2,2,2)
PR: Proficiency in an applied instrument or voice (200 level or above) or consent of instructor. Survey of the development of the art song from the middle ages to the present with emphasis on technical, formal and performance problems.

MUS 230,232,303 Counterpoint (3,3,3)
PR: MUS 203. Analysis and creative writing in the contrapuntal-harmonic technique of Baroque composers through the various methods of the twentieth century.

MUS 304 Madrigal Singers (1)
PR: Consent of instructor by audition. May be repeated for credit. Participation in a select vocal ensemble for the study and performance of madrigals and similar works from the fourteenth century to the present.

MUS 307 Concert Choir (1)
PR: Consent of instructor. May be repeated for credit. Study, rehearsal and performance of choral works of all styles and periods. Open to all students.

MUS 308 Band (1)
Participation in a chamber or large ensemble for purposes of studying and performing band literature. Open to all students. May be repeated for credit.

MUS 309 Orchestra (1)
Participation in a chamber or large ensemble for purposes of studying and performing symphonic orchestral literature. Open to all students. May be repeated for credit.

MUS 311 Piano (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 312 Voice (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 313 String (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 314 Woodwind (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 315 Brass (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 316 Percussion (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 317 Organ (2)
PR: Consent of instructor. One hour private instruction per week. May be repeated for credit.

MUS 320,321,322 Orchestration (3,3,3)
PR: Proficiency in an applied instrument or voice (300 level or above) or Music Theory 203. Preliminary study of band and orchestral instruments. Scoring for band, orchestra and various instrumental combinations.

MUS 340,341,342 Music History (3,3,3)
Music in Western Civilization traced from its primitive sources to the present; emphasis on composers' styles in relation to the cultural backgrounds of the various eras.

MUS 350 Composition (2-5)
PR: MUS 303 or consent of instructor. May be repeated for credit. Creative work in large and small forms in the area of choral, instrumental and keyboard media.

MUS 380 Fundamental Music Skills (3)
(For non-majors). Primarily for the prospective teacher as an introduction to the basic music skills necessary for teaching in elementary and secondary schools: notation, rhythm, singing, basic piano skills and fundamentals of conducting.

MUS 399 Introduction to Music (3)
(For non-major). The study of music through listening, readings and discussions leading to greater enjoyment of music.

MUS 401,402,403 Form and Analysis (3,3,3)
PR: MUS 302. Formal aspects of the styles of major composers with an emphasis on orchestral literature.
logic, logistic systems, and axiomatic methods. Problems of metatheory.

PHI 205 Introductory Logic (3)
- Static analysis of patterns of inference; examination of logical forms; development of elementary techniques for assessing validity of inferences.
- PHI 221 Introduction to Philosophy (3)
- Inquiry into the meaning and justification of fundamental ideas and beliefs concerning reality, knowledge, and values; application to relevant topics in ethics, religion, and politics.
- PHI 305 Intermediate Logic (3)
- PHI 205: Systematic study of propositional and first-order predicate logic, logical systems, and axiomatic methods. Problems of metatheory, including consistency, completeness, and decidability.

PHI 221 Greek and Roman Philosophy (3)
- The emergence of enduring philosophical questions, critical thought, and metaphysical speculation from the pre-Socrates to Neoplatonism, with particular emphasis on Socrates, Plato and Aristotle.

PHI 232 Medieval and Renaissance Philosophy (3)
- Survey of Scholasticism; the fusion of philosophy and religion; emergence of independence in philosophical thinking; naturalism and humanism; transition to the modern period. Consideration of such philosophers as Aquinas, Bacon, Hobbes.

PHI 325 Philosophy of the Enlightenment (3)
- Development of rationalism and empiricism in the 17th and 18th centuries. Attention to major philosophers of the period, including Descartes, Locke, Hume, Kant.

PHI 327 Nineteenth-Century Philosophy (3)
- Development of idealism, materialism, positivism and utilitarianism. Consideration of such philosophers as Hegel, Marx, Comte, Nietzsche, Mill.

PHI 329 Twentieth-Century Philosophy (3)
- Development of pragmatism, logical positivism, linguistic analysis, phenomenology, existentialism, process philosophy. Major issues in contemporary philosophy.

PHI 429 Existentialism (3)
- Study of existentialist analysis and criticism of the human situation as found in the writings of such philosophers as Kierkegaard, Nietzsche, Heidegger, Sartre, and Camus.

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

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

PHYSICS

PHYS 103 Astronomy (4)
- Two years of high school mathematics. An elementary survey of the astronomical universe including pulsars and the application of space technology to observational astronomy. Appropriate for the Environmental Studies Program.

PHYS 107, 108 College Physics (4, 3)
- Two years of high school mathematics. A study of classical mechanics, thermodynamics, electricity, magnetism, optics, and modern physics. Especially suited for students who desire to use physics to satisfy the science requirements of the Environmental Studies Program.

PHYS 189 College Physics Laboratory (1)
- PHYS 107. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 211, 212, 213 General Physics (4, 3, 3)
- CR: MATH 221. An introductory course for students requiring a thorough study of the basic principles of physics. A study of classical mechanics, thermodynamics, electricity, magnetism, optics, and modern physics.

PHYS 227, 228 Classical Mechanics (3, 3)
- PHYS 213 or PHYS 108 or consent of instructor. A study of statics and dynamics of rigid bodies, planetary motion, and special relativity. Intended for prospective teachers of science in secondary schools and others desiring knowledge of mechanics.

PHYS 281 Scientific Instruments Laboratory (4)
- PHYS 107 or 103 or consent of instructor. A lecture-laboratory course in the fundamentals of mechanics, electrical circuitry, optics and nuclear physics as required in the application and operation of scientific instruments. Two, three hour classes per week.

PHYS 282, 283 General Physics Laboratory (1, 1)
- PHYS 211. Laboratory experimentation and instruction covering selected topics in physics. Three hours per week.

PHYS 287, 288, 289 Physical Measurements (3, 3, 3)
- PHYS 213 or 108 or consent of instructor. A laboratory oriented course that begins with basic electrical circuits and includes a study of vacuum tubes, semiconductors and other electronic devices such as rectifiers, amplifiers and oscillators. Experiments in Modern Physics are also included. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in circuits and electronics related to physical measurements.

PHYS 321, 322, 323 Mechanics (3, 3, 3)
- PHYS 213 and MATH 222 or consent of instructor. A study of mechanics including vectors, coordinate transformations, fundamental theorems of Newtonian mechanics, rigid body dynamics, small oscillations, Lagrangian mechanics, and special relativity.
PHYS 331,332,333 Electricity and Magnetism (3,3,3)
PR: PHYS 213, CH: MATH 321 or consent of instructor. An intro-
duction to scalar and vector fields, electric and magnetic fields, current, magnetic, Maxwell's equations, radiation, waveguides, and physical optics.

PHYS 336,336E Electronics (3,3)
PR: PHYS 213 or consent of Instructor. The study of basic D.C. and A.C.
circuit theory, the properties of vacuum tubes, semiconductors, power supplies, vacuum tubes and transistors, amplification, oscillation, mod-
ulation, detection, and noise.

PHYS 341,342,343 Modern Physics (3,3,3)
PR: PHYS 213 and MATH 223 or consent of instructor. The study of black body radiation, the interaction of radiation and matter, atomic spectra, nuclear and high energy physics, particle accelerators, molecular, and solid state physics.

PHYS 344 Modern Physics for Engineers (3)
PR: ENGR 221 and MATH 221. Selected topics in atomic, nuclear, molecular, and solid state physics. A study of spectroscopy, x-rays, nuclear radiation, and cosmic rays.

PHYS 347,348 Concepts in Modern Physics (3,3)
PR: PHYS 213 or PHYS 108 or consent of instructor. A study of modern physics including atomic and molecular structure, Bohr model of the atom, special relativity, and solid state physics. Intended for prospective teachers of science in secondary schools and others desiring an intro-
ductive course in modern physics.

PHYS 351,352 Optics (3,3)
PR: PHYS 213 or consent of instructor. A study of refraction, inter-
ference, diffraction, optical instruments, dipole radiation, Kirchhoff integral, scattering, polarization, and stimulated emission.

PHYS 354 Optics and Wave Motion for Engineers (3)
PR: ENGR 221 and MATH 221. Selected topics in optics, acoustics, and rela-
ted wave phenomena. A study of reflection, refraction, interference, and diffraction.

PHYS 357,358 Wave Motion and Optics (3,3)
PR: PHYS 213 or PHYS 108 or consent of instructor. A lecture and laboratory study of simple wave phenomena such as sound, light, and vibrations. Topics in both geometrical and physical optics will be consid-
ern. Intended for prospective teachers of science in secondary schools and others desiring knowledge and experience in wave phenomena.

PHYS 381 Physics Laboratory — Electronics (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work stress electronic principles through the study of test equipment, power supplies, amplifiers, oscilloscopes, and pulse circuits.

PHYS 382 Physics Laboratory — Electricity and Magnetism (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in basic electrical measurements, measurement of electric and magnetic fields, and materials and elements.

PHYS 383 Physics Laboratory — Nuclear Physics (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in nuclear physics stressing nuclear radiation and the interaction of radiation with matter.

PHYS 384 Physics Laboratory — Optics and Wave Motion (3)
PR: PHYS 213 or consent of instructor. Lecture and laboratory work in basic optical and wave phenomena. Selected experiments in interference and diffraction of waves, polarized light, spectroscopy, microscopes, and optical pumping.

PHYS 386 Physics Laboratory — Modern and Solid State Physics 3PR: PHYS 213 or consent of instructor. Lecture and laboratory work in selected areas of modern and solid state physics. A study of electrical conductivity in solids, temperature dependence in semiconductors, Hall effect, and electron mobility.

PHYS 461 Solid State Physics (2)
PR: PHYS 343 or consent of instructor. Properties of solids, crystal binding, free electron model, band theory of solids, Fermi surface, and solid state applications.

PHYS 471,472 Quantum Mechanics (3,3)
PR: PHYS 343 or consent of instructor. A study of the postulates of quantum mechanics, the Schroedinger equation, and an introduction to the

PHYS 476 Statistical Physics (3)
PR: PHYS 343 or consent of instructor. An introduction to thermo-
dynamics, statistical mechanics, and kinetic theory.

PHYS 491 Contemporary Physics (3)
PR: Consent of instructor. Concepts, experiments, problems, and advanced topics included in courses such as PSSC physics and other modern approaches to secondary school physics. For prospective teachers of physics. (Same as EDEE 484)

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

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

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

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

POLITICAL SCIENCE

PCL 201 American National Government (3)
A study of the dynamics of American national government including its structure, organization, powers, and procedures.

PCL 203 Principles of Political Science (3)
The scope of political science and its development as a field with emphasis on areas of concern; analysis of the major approaches to the study of politics; familiarization with recent developments in research and research techniques.

PCL 301 American State and Local Government (3)
PR: PCL 201, 203 or consent of instructor. Analysis of the organization and functions of state and local governments and of problems of policy formulation and execution, particularly as they relate to the federal system.

PCL 305 Political Parties and Processes (3)
PR: PCL 201, 203 or consent of instructor. Study of American politics with major emphasis upon the role, organization, functions, and processes of parties in the American political system.

PCL 308 The American Presidency (3)
PR: PCL 201, 203 or consent of instructor. Examination of the presidency as an institution and of the evolution in status, power, and function of the executive branch of government.

PCL 310 Congress and the Legislative Process (3)
PR: PCL 201, 203 or consent of instructor. The nature, role, and function of the legislative process; the dynamics of executive-legislative relations and resultant problems.

PCL 321 International Relations (3)
PR: PCL 201, 203 or consent of instructor. Analysis of the fundamental principles and factors affecting interstate relations; the foreign policy decision-making processes of states; the role and power of war; conflict and methods of resolution.

PCL 322 International Relations (3)
PR: PCL 201, 203 or consent of instructor. Application of the theory and fundamentals of international politics to contemporary world affairs with attention to the impact of twentieth century developments upon the international system and its actors.

PCL 341 Comparative European Politics (3)
PR: PCL 201, 203 or consent of instructor. An analytical and com-
parative study of the major governments of Europe and their impact upon the development of types of political systems.

PCL 343 Politics of Developing Areas (3)
PR: PCL 201, 203 or consent of instructor. An analysis of non-Western political systems with emphasis upon the problems of political, socio-
economic, and cultural development as they affect attempts to achieve the transformation to modernization.

PCL 360 American Political Philosophy (3)
PR: PCL 201, 203 or consent of instructor. A survey of the chief contributions of American political thought, their sources and background as focused within the context of American historical and institutional development.

PCL 403 Political Behavior (3)
PR: PCL 201, 203 or consent of instructor. A study of the role and impact of group behavior and interest articulation in a pluralistic society and their effect upon the political process.

PCL 405 Political Theory (3)
PR: PCL 201, 203 or consent of instructor. Examination at an advanced level of various normative and empirical approaches to the study of political science, stressing contemporary developments in the field.

PCL 410 Public Administration (3)
PR: PCL 201, 203 or consent of instructor. Analysis of administrative theories and of the processes by which public policies are implemented in a democratic society.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>PCL 413</td>
<td>Metropolitan Politics (3)</td>
<td>PCL 301, 203 or consent of instructor. Analysis of political patterns, processes, and issues in American communities.</td>
</tr>
<tr>
<td>PCL 427</td>
<td>American Foreign Policy (3)</td>
<td>PCL 301, 203 or consent of instructor. An analysis of the traditions and development of American foreign policy with major emphasis on the roles and policies of the United States in the contemporary world.</td>
</tr>
<tr>
<td>PCL 430</td>
<td>International Organizations (3)</td>
<td>PCL 201, 203 or consent of instructor. The nature and growth of international agencies of cooperation with attention focused upon the problems and development of functional, regional, and universal organizations.</td>
</tr>
<tr>
<td>PCL 432</td>
<td>International Law (3)</td>
<td>PCL 201, 203 or consent of instructor. An introduction to the nature, evolution, and sources of international law and its role in interstate relations.</td>
</tr>
<tr>
<td>PCL 481</td>
<td>Political Philosophy (3)</td>
<td>PCL 201, 203 or consent of instructor. Study of the development of political and social ideas in Western thought from early Greece to the Renaissance.</td>
</tr>
<tr>
<td>PCL 462</td>
<td>Political Philosophy (3)</td>
<td>PCL 201, 203 or consent of instructor. Renaissance to the 19th Century.</td>
</tr>
<tr>
<td>PCL 463</td>
<td>Political Philosophy (3)</td>
<td>PCL 201, 203 or consent of instructor. Study of contemporary Western political and social thought in the 19th and 20th Century.</td>
</tr>
<tr>
<td>PCL 471</td>
<td>American Constitutional Law (5)</td>
<td>PCL 201, 203 or consent of instructor. The impact of judicial decision-making upon the growth of American political institutions and processes.</td>
</tr>
<tr>
<td>PCL 473</td>
<td>American Constitutional Law (5)</td>
<td>PCL 201, 203 or consent of instructor. The role of the judiciary in the focusing and refinement of individual rights and civil liberties in American society.</td>
</tr>
<tr>
<td>PCL 497</td>
<td>Undergraduate Seminar (2-6)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
<tr>
<td>PCL 498</td>
<td>Independent Study (2-6)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
<tr>
<td>PCL 499</td>
<td>Undergraduate Research (2-5)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
<tr>
<td>PSY 201</td>
<td>General Psychology (3,3)</td>
<td>The basic principles, theories, and methods of contemporary psychology.</td>
</tr>
<tr>
<td>PSY 202</td>
<td>Applied Psychology (4)</td>
<td>Applications of principles of psychology to problems of human development, personal and social adjustment, career choice and satisfaction.</td>
</tr>
<tr>
<td>PSY 301</td>
<td>Basic Learning Processes (4)</td>
<td>PSY 201, 202. A survey of theories and research findings from basic laboratory investigation of learning phenomena. Lec-lab.</td>
</tr>
<tr>
<td>PSY 302</td>
<td>Complex Human Learning (4)</td>
<td>PSY 301. Selected topics from theories and research on complex human learning and problem solving. Lec-lab.</td>
</tr>
<tr>
<td>PSY 303</td>
<td>Physiological Psychology (4)</td>
<td>PSY 201, 202. Physiological bases and correlates of behavior. Lec-lab.</td>
</tr>
<tr>
<td>PSY 304</td>
<td>Perception (4)</td>
<td>PSY 201, 202. Consideration of physical and psychological variables in perceptual phenomena. Lec-lab.</td>
</tr>
<tr>
<td>PSY 305</td>
<td>Psychological Measurement (4)</td>
<td>PSY 201, 202, STAT 201. Theory of test construction and consideration of selected measures of psychological characteristics.</td>
</tr>
<tr>
<td>PSY 306</td>
<td>Psychology of Adjustment (4)</td>
<td>Psychological principles of adjustment, application of psychology to problems in living.</td>
</tr>
<tr>
<td>PSY 308</td>
<td>Social Psychology (4)</td>
<td>PSY 201, 202. Effects of social situations and social variables on the behavior of individuals.</td>
</tr>
<tr>
<td>PSY 309</td>
<td>Personality Theory (4)</td>
<td>PSY 201, 202. A survey of theory and research on the development of personality characteristics. Lec-lab.</td>
</tr>
<tr>
<td>PSY 310</td>
<td>Abnormal Psychology (4)</td>
<td>PSY 201, 203. Classification, causation, and treatment of deviant patterns of behavior.</td>
</tr>
<tr>
<td>PSY 311</td>
<td>Methods of Psychological Research (3)</td>
<td>PSY 201, 202. Critical evaluation of research methods in psychology, considerations of internal and external validity.</td>
</tr>
<tr>
<td>PSY 312</td>
<td>Clinical Psychology (4)</td>
<td>PSY 301. Consideration of psychodiagnosis, behavioral modification techniques and clinical research. Lec-lab.</td>
</tr>
<tr>
<td>PSY 313</td>
<td>Developmental Psychology (4)</td>
<td>The effects of genetic, psychological, maturational, and social factors on behavior at various stages of development.</td>
</tr>
<tr>
<td>PSY 314</td>
<td>Industrial Psychology (4)</td>
<td>PSY 201, 202, STAT 201. Psychological principles of employee selection, training, and morale.</td>
</tr>
<tr>
<td>PSY 401</td>
<td>Senior Research Proposal (2)</td>
<td>PSY 201, 203 or consent of instructor. A survey of research methods in psychology, aims to evaluate psychological characteristics.</td>
</tr>
<tr>
<td>PSY 405</td>
<td>History and Systems of Psychology (4)</td>
<td>PSY 301, 309. Historical development of psychology with emphasis on classical theoretical positions.</td>
</tr>
<tr>
<td>PSY 497</td>
<td>Undergraduate Seminar (2-6)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
<tr>
<td>PSY 498</td>
<td>Independent Study (2-6)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
<tr>
<td>PSY 499</td>
<td>Undergraduate Research (2-5)</td>
<td>Consent of instructor. May be repeated for credit.</td>
</tr>
</tbody>
</table>

**RADIO/TELEVISION**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTV 140</td>
<td>Radio-Television I (3)</td>
</tr>
<tr>
<td>RTV 240</td>
<td>Audio Production I (3)</td>
</tr>
<tr>
<td>RTV 241</td>
<td>Television Production I (3)</td>
</tr>
<tr>
<td>RTV 340</td>
<td>Audio Production II (3)</td>
</tr>
<tr>
<td>RTV 341</td>
<td>Television Production II (3)</td>
</tr>
<tr>
<td>RTV 342</td>
<td>Broadcast Journalism I (3)</td>
</tr>
<tr>
<td>RTV 344</td>
<td>Broadcast Continuity and Programming I (3)</td>
</tr>
<tr>
<td>RTV 345</td>
<td>Film for Television (3)</td>
</tr>
<tr>
<td>RTV 346</td>
<td>Radio, Television, and Society (3)</td>
</tr>
</tbody>
</table>
RTV 361 Radio Production and Directing (3)
PR: RTV 340. Techniques and practice in producing and directing radio programs. (Laboratory hours to be arranged).

RTV 441 Television Production and Directing (3)
PR: RTV 341. The planning, preparation and directing of programs with emphasis on dramatic values of composition, movement, position, action timing, pacing, climax, ascendant and descendant values; integration of the parts to the whole. (Laboratory hours to be arranged).

RTV 444 Broadcast Continuity and Programming II (3)
PR: RTV 344 or consent of instructor. Preparation of documentaries and dramatic writing for radio and television.

RTV 445 Television Film Production (3)
PR: Consent of Instructor. Planning and preparation of filmed documentaries, public service and commercial productions. (Laboratory hours to be arranged).

RTV 448 Broadcast Regulations (3)
PR: RTV 143 or RTV 342. Federal, state, local and self-regulatory agencies and practices which govern electronic media. (Laboratory hours to be arranged).

RTV 450 Broadcast Journalism II (3)
PR: JRN 321, for radio-television concentrations, RTV 342. Principles and practice of news preparation for electronic media. (Laboratory hours to be arranged).

RTV 451 Radio-Television Advertising (3)
PR: Consent of instructor. Radio and television as advertising media; advertisers' demands and budgets; appropriate programs for the sponsors' needs; writing of commercial continuity.

RTV 452 Broadcast Criticism (3)
Evaluation and criticism of past and present radio and television programs, policies and practices. Concentration on the problem of criticism development.

RTV 453 Educational Broadcasting (3)
PR: Consent of instructor. The values and potentials of radio and television in education, with particular emphasis on current use of the media in elementary and secondary schools, college, and universities, and adult education.

RTV 454 Institutional Broadcasting (3)
Learning theory applied to the creation, production and dissemination of lessons via electronic media. Introduction to and practice in radio and television studios as well as lesson presentation. (Laboratory hours to be arranged).

RTV 457 Broadcast Internship (12-15)
PR: RTV 240 and RTV 344 and consent of instructor. Practicum at a selected professional broadcast production center for one quarter. In addition to a regular prescribed work schedule, the intern must submit a weekly log of his activities and produce significant research paper.

RTV 458 Broadcast Management (3)
PR: RTV 446. Consideration of broadcast management problems in station operations at the local, regional and national levels.

RTV 466 Special Topics (2-5)
PR: Consent of instructor. May be repeated for credit.

RTV 468 Independent Study (2-6)
PR: Consent of instructor. May be repeated for credit.

RELIGION
REL 301 Comparative Religions I (3)
The religions of China and Japan, their concepts, philosophy, and rituals.

REL 302 Comparative Religions II (3)
The religions of India and Southeast Asia.

REL 303 Comparative Religions III (3)
The religions of the Near East.

REL 321 Religion in America (3)
The effect of Puritan, Quaker, Anglican, and Catholic traditions on various regions; the phenomenon of evangelism; the rise of new sects such as Mormonism.

REL 441 Modern Theology (3)

RUSSIAN
RUS 101 Elementary Russian Language and Civilization (3)
Designed to initiate the student to the major language skills; listening, speaking, reading, and writing, in addition to an introduction to Russian culture.

RUS 102 Elementary Russian Language and Civilization (3)
PR: RUS 101 or equivalent. Continuation of RUS 101.

RUS 103 Elementary Russian Language and Civilization (3)
PR: RUS 102 or equivalent. Continuation of RUS 102.

RUS 201 Intermediate Russian Language and Civilization (3)
PR: RUS 103 or equivalent. Designed to continue development of language skills at the intermediate level, together with a review of grammar, study of syntax, idiomatic expressions, extensive reading, and further study of Russian culture.

RUS 202 Intermediate Russian Language and Civilization (3)
PR: RUS 201 or equivalent. Continuation of RUS 201.

RUS 203 Intermediate Russian Language and Civilization (3)
PR: RUS 202 or equivalent. Continuation of RUS 202 with greater emphasis on Russian civilization from the Middle Ages to the present.

RUS 301 Russian Composition (4)
PR: RUS 203 or equivalent. Development of skills in composition through systematic review of grammar, syntax, and development of style. Free and controlled written compositions required.

RUS 302 Russian Conversation (4)
PR: RUS 203 or equivalent. Development of skills in conversation and comprehension through practice and systematic review of phonology and grammatical structure.

SCIENCE
SCI 400 Senior Seminar: Science in Human Affairs (2)
The impact of science on modern society. This course, primarily intended for the senior student, is offered as one of the Advanced Environmental Studies seminars. Not open to students majoring in the College of Natural Sciences.

SOCIOLOGY
SOC 201, 202.


Social Welfare Concentration: SOC 300, 301, 301, 304, 312, 312, 412, 412, 412.


Social Deviance: SOC 301, 301, 304, 346, 348, 350.

SOC 201, 202 General Sociology (3,3)
An introduction to the principles of sociology. Primary emphasis is given to the understanding and application of such concepts as: human interaction, the nature of the group and group interactions, social and cultural systems, the individual as a reflection of his group associations.

SOC 304 The Development of Social Thought (5)
PR: SOC 201, 202. An overview of theories concerning the nature of man as a "social being" and of the nature of society, from the classical Greek-Roman period to the Second World War.

SOC 306 Modern Sociological Thought (5)

SOC 307 The Sociology of Religion (3)
Patterns in religious behavior in various societies with primary emphasis on myth, rites, taboo and festival as social phenomena.

SOC 321, 322 General Anthropology (3,3)
An introduction to the principles of anthropology. The nature of culture and of culturally derived norms of human behavior. The various aspects of anthropology, human prehistory, physical anthropology, culture and personality, anthropological linguistics.

SOC 325 Urban Sociology (5)
PR: SOC 201, 202. Historical roots of urbanization. Impact of city life on
SOC 326 Rural Sociology (3)
PR: SOC 201, 202. Rural American life, its resources, and the problems of
crime and delinquency.

SOC 333 Industrial Sociology (6)
PR: SOC 201, 202. Application or development of principles of sociology
relevant to the industrial mode of production and the industrial way of
life.

SOC 336 Social Institutions (3)
Social institutions, social differentiation, and social control, with emphasis
on American and other modern societies.

SOC 340 Social Welfare: A Social Institution (6)
PR: SOC 201, 202. An introduction to social welfare as a profession.
The historical and philosophical development of social welfare as related to
current social welfare objectives and programs.

SOC 341 Social Work: Principles and Methods (3)
PR: SOC 340. A theoretical consideration of the concepts and methods of
social work practice and the values, activities and roles of social workers in
various practice settings.

SOC 342 Government and Social Welfare (3)
PR: SOC 340, 341. The role of federal, state, and local government in
social welfare. Laws, policy formulation, administration, and current issues
will be examined.

SOC 343 The Community and Social Welfare (3)
PR: SOC 340, 341. The community as a social system in meeting human
needs. Emphasis on private agencies, including their organization,
functions, interrelationships and coordination with governmental agencies.

SOC 345 Juvenile Delinquency (6)
PR: SOC 201, 202. Types of delinquent behavior found among juveniles,
possible causes and ways society attempts to treat the various forms of
delinquency.

SOC 346 Criminology (6)
PR: SOC 201, 202, 345. Chief causes of anti-social behavior and current
methods of prevention and reform. Effects of heredity and environment,
prevalence of delinquency and crime, penal Institutions.

SOC 348 Sociology of Alcoholism (3)
Introduction to the nature of alcoholism and review of its impact on
society.

SOC 350 Sociology and the Supreme Court: A Focus for Social Change (3)
Sociological, economic and political forces giving rise to and resulting from
decisions of the Supreme Court.

SOC 362 Intergroup Conflict and Prejudice (3)
PR: SOC 201, 202. Causes and consequences of group conflict, with
emphasis upon majority-minority relations, prejudice and discrimination,
alternative theories of prejudice, the effects of minority status on
Individuals and possibilities for attitude and behavior change.

SOC 363 Culture and Personality (3)
PR: SOC 201, 202. Theories of the variations in personality in relation to
culture and group life in tribal and modern societies.

SOC 364 The Sociology of Adolescence (3)
PR: SOC 201, 202. An examination of the transition to adulthood in
various societies with primary emphasis on initiation and the con-
temporary American problems centering around the “adolescent crisis.”

SOC 407 The Family (6)
PR: SOC 201, 202. The study of the family as a social institution. The
family through history, and the family cross-culturally. The modern
American family as a distinct social and cultural complex. Changes in the
family system, Courtship and marriage.

SOC 411 Demography (3)
PR: SOC 201, 202. Concerned with the study of human population, its
distribution, composition and change.

SOC 412 Field Experience and Seminar (5)
PR: SOC 340, 341, 342, 343 and Senior Standing. Supervised learning
experiences in local social agencies relating theory and academic prep-
aration with practice. Eight hours per week plus two hour weekly seminar.

SOC 416 Human Ecology (3)
Principles governing the spatial distribution of human populations and
activities within an area.

SOC 451 Contemporary Social Movements (3)
PR: SOC 201, 202, 231. Causes and effects of various social movements
in American society compared to large-scale upheavals throughout the
West. Considers various theories of explanation.

SOC 496 Special Topics (2-6)
PR: Consent of instructor. May be repeated for credit.

SOC 498 Independent Study (2-6)
PR: Consent of instructor. May be repeated for credit.

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

SPANISH

SPA 101 Elementary Spanish Language and Civilization (3)
Designed to initiate the student to the major language skills: listening,
speaking, reading, and writing, in addition to an introduction to Spanish
culture.

SPA 102 Elementary Spanish Language and Civilization (3)
PR: SPA 101 or equivalent. Continuation of SPA 102.

SPA 103 Elementary Spanish Language and Civilization (3)
PR: SPA 102 or equivalent. Continuation of SPA 102.

SPA 201 Intermediate Spanish Language and Civilization (3)
PR: SPA 103 or equivalent. Development to continue development of
language skills at the intermediate level, together with a review of
grammar, study of syntax, idiomatic expressions, extensive reading, and
further study of Spanish culture.

SPA 202 Intermediate Spanish Language and Civilization (3)
PR: SPA 201 or equivalent. Continuation of SPA 201.

SPA 203 Intermediate Spanish Language and Civilization (3)
PR: SPA 202 or equivalent. Continuation of SPA 202 with greater
emphasis on Spanish civilization from the Middle Ages to the present.

SPA 204 Spanish Composition (4)
PR: SPA 203 or equivalent. Development of skills in composition through
systematic review of grammar, syntax and development of style. Free and
controlled written composition required.

SPA 303 Spanish Conversation (4)
PR: SPA 203 or equivalent. Development of skills in conversation and
comprehension through practice and systematic review of phonology and
grammatical structure.

SPA 311 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the
Middle Ages through the Renaissance and Baroque.

SPA 312 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works of the
eighteenth and nineteenth centuries.

SPA 313 Survey of Spanish Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the
Generation of 1898 to the present.

SPA 318 Survey of Latin-American Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the
colonial period through the struggle for independence.

SPA 317 Survey of Latin-American Literature (3)
PR: SPA 203 or equivalent. Main literary currents and works from the
second half of the nineteenth century to the present.

SPA 401 Spanish Phonetics and Diction (2)
PR: SPA 353 or equivalent. Spanish phonology with emphasis on phonic
groupings.

SPA 421 Golden Age Drama (3)
PR: SPA 311. A study of the drama of the Golden Age with special
emphasis on Lope, Tirso, Alarcon, and Calderon. The controversies on the
Spanish theatre and its influence abroad.

SPA 423 Cervantes (3)
PR: SPA 311, Don Quijote.

SPA 441 Nineteenth-Century Spanish Literature (3)
PR: SPA 312, Romanticism in Spanish literature.
SPE 442 Nineteenth-Century Spanish Literature (3)  
PR: SPA 312. The realistic and naturalistic novel in Spain.

SPE 443 The Generation of 1898 (3)  
PR: SPA 313. A study of the Generation's main authors and their works.

SPE 451 Twentieth-Century Spanish Literature (3)  
PR: SPA 313. The contemporary Spanish novel.

SPE 452 Twentieth-Century Spanish Literature (3)  
PR: SPA 313. Contemporary Spanish drama and poetry.

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

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

SPEECH

SPE 101 Fundamentals of Oral Communication (3)  
Use of the body and voice; participation in various speaking situations; planning, organizing, and delivering public speeches.

SPE 261 English Phonetics and American Dialects (3)  
Phonological description and visual notation of speech sounds; regional dialects of American English.

SPE 262 Psychology of Oral Communication (3)  
Psychological principles involved in the communicative process with application to individuals and groups.

SPE 360 Persuasion: Argumentation (3)  
PR: SPE 101 or consent of instructor. Study and practice in the preparation and delivery of argumentative speeches emphasizing argument, evidence and organization.

SPE 361 Persuasion: Motivation (3)  
PR: SPE 101 or consent of instructor. A study of motivational factors involved in persuasive speaking to secure belief and action.

SPE 362 Platform Speaking (3)  
PR: SPE 101 or consent of instructor. Theory and method; training in selecting and organizing materials for various types of speeches; practice in thinking and speaking before an audience; contemporary speeches as examples.

SPE 363 Discussion (3)  
Nature of discussion and conference, problem analysis, duties of the participants, function of leader, and participation in various group situations.

SPE 365 Parliamentary Procedure (2)  
Principles and rules governing participation and leadership in the conduct of informal business meetings.

SPE 370 Directing Extracurricular Speech Activities (3)  
Debate, extramural debate and other speech events; selection and training of contestants; interscholastic and intramural speech activities.

SPE 371 Speech and Human Relations (3)  
Introduction to semantics; symbols and meaning and the relationship with human behavior.

SPE 460 Group Dynamics (3)  
PR: SPE 363 or consent of instructor. A study of human behavioral problems in various conference and group situations.

SPE 461 Studies in Modern Oral Communication Theory (3)  
Comparative study of the views of modern rhetorician and oral communication theorists.

SPE 462 Persuasion (3)  
PR: SPE 360. Application of the theory of reasoned discourse. Emphasis on evidence, argument, and analysis; factors involving the change of audience attitudes, and their application in the speaking situation. Student speeches, reports and projects.

SPE 463 Studies in Listening (3)  
Analysis of current trends, professional literature, and resource materials bearing upon the teaching of listening in the classroom. Practice in listening; preparing listening experiences; oral and written reports.

SPE 468 Survey of Rhetoric (3)  
General Survey: Major rhetorical trends from the classical era to the present. Comparison of Aristotelian and non-Aristotelian rhetorics. Contributions of principal figures will be discussed.

SPE 470 History and Criticism of American Public Address (3)  
Rhetorical criticism of speaking and writing of American statesmen that have had an influence on political, social, and economic milieu of their times.

SPE 471 History and Criticism of British Public Address (3)  
Rhetorical criticism of speaking and writing of British statesmen that have had an influence on political, social, and economic milieu of their times.

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

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

STATISTICS

STAT 201 Principles of Statistics (4)  
PR: Two years of high school mathematics or one course of college mathematics. A lecture-laboratory course designed to introduce the student to statistical concepts in modern society. An introduction to basic principles: frequency distributions, measures of location and dispersion, probability, probability distributions, statistical inference.

STAT 321 Business & Economic Statistics (4)  
PR: ECON 203, MATH 115, and STAT 201. The use of statistical methods as scientific tools in the analysis of economic and business problems. Emphasis is placed on the collection, analysis, and interpretation of quantitative economic and business data. (Same as ECON 321).

STAT 332 Statistical Quality Control (3)  
Statistical concepts and methods applied to the control of quality of manufactured products. (Same as IEMS 332).

STAT 335 Probability and Statistics for Engineers (3)  
PR: MATH 321. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; engineering applications. (Same as ENGR 371.)

STAT 341,342,343 Mathematical Statistics (3,3,3)  
PR: MATH 223. Sample space, probability axioms, distribution functions, sampling distributions, point and interval estimation, hypothesis testing, multivariate normal, regression and correlation, linear models, analysis of variance, distribution-free methods, an introduction to stochastic processes.

STAT 401,402 Statistical Methods (4,4)  
PR: One course in statistics or graduate standing. A lecture-laboratory course designed to introduce the student to the role of statistics in research; methods of analyzing data from experiments and surveys; statistical concepts and models; estimation, tests of hypotheses, regression and correlation; analysis of variance and covariance; an introduction to the principles of the statistical design of experiments and surveys.

STAT 411 Experimental Design (3)  
PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; experimental unit technique; complete block designs; confounding in factorial experiments; incomplete block designs; response surface methodology.

STAT 421 Survey Design (3)  
PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

STAT 435 Probability for Engineers (3)  
PR: STAT 335. Combinatorial analysis, sample space, events, probability, discrete and continuous random variables, probability distributions with engineering applications. (Same as ENGR 371.)

STAT 436 Probability and Statistics for Engineers (3)  
PR: MATH 321. Axioms of probability; combinatorial and geometrical probability; probability distributions; measures of location and dispersion; sampling and sampling distributions; estimation and tests of hypotheses; regression and correlation; analysis of variance and covariance; an introduction to the principles of the statistical design of experiments and surveys.

STAT 441 Experimental Design (3)  
PR: STAT 402. Methods of constructing and analyzing designs for experimental investigations; concepts of blocking, randomization, and replication; experimental unit technique; complete block designs; confounding in factorial experiments; incomplete block designs; response surface methodology.

STAT 442 Survey Design (3)  
PR: STAT 402. Methods of constructing and analyzing designs for survey investigations; simple random, stratified, multistage, and multiphase sampling designs; questionnaire construction; methods of estimation; techniques of survey investigation.

STAT 456 Probability Theory and Applications (3,3)  
PR: MATH 321. Axioms of probability, discrete and continuous random variables, characteristic functions, Markov chains, recurrent events, sequences of random variables, random walk, simple stochastic processes.

STAT 466 Special Topics (2-5)  
PR: Consent of instructor. May be repeated for credit.

STAT 497 Undergraduate Seminar (2-5)  
PR: Consent of instructor. May be repeated for credit.
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>PR</th>
<th>Description</th>
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<tbody>
<tr>
<td>THA 180</td>
<td>Study of Drama and Theatre (I)</td>
<td></td>
<td>Nature of drama and the theatre, and basic principles of play analysis.</td>
</tr>
<tr>
<td>THA 220, 221, 222</td>
<td>Theatre Practice I (1,1,1)</td>
<td>Consent of Instructor. May be repeated for credit.</td>
<td>Introduction to stagecraft, lighting, properties, costume design. Laboratorv hours to be arranged and practical experience on technical crews as required.</td>
</tr>
<tr>
<td>THA 230</td>
<td>Interpretation I (3)</td>
<td></td>
<td>Analysis of thought; development of imagination; oral presentation of literary forms; individual problems in interpretive reading.</td>
</tr>
<tr>
<td>THA 283, 284, 285</td>
<td>Acting I (1,1,1)</td>
<td>Consent of Instructor. May be repeated for credit.</td>
<td>Study and practical experience in problems of creating characterization, with emphasis on developing vocal and physical skill in acting.</td>
</tr>
<tr>
<td>THA 320, 321, 322</td>
<td>Theatre Practice II (1,1,1)</td>
<td></td>
<td>Practical experience in designing and operating technical aspects of dramatic productions. (Service on crews is required).</td>
</tr>
<tr>
<td>THA 331</td>
<td>History of the Theatre: Classical and Renaissance (3)</td>
<td></td>
<td>Development of theatre art from the earliest times through the sixteenth century.</td>
</tr>
<tr>
<td>THA 332</td>
<td>History of the Theatre: Seventeenth to the Twentieth Century (3)</td>
<td></td>
<td>Development of theatre art from the beginning of the seventeenth century through the nineteenth century.</td>
</tr>
<tr>
<td>THA 333</td>
<td>History of the Theatre: Staging and Architecture (3)</td>
<td></td>
<td>Study of costume and staging from earliest times to the present.</td>
</tr>
<tr>
<td>THA 334</td>
<td>Techniques of the Motion Picture (3)</td>
<td>Consent of Instructor.</td>
<td>An examination of the techniques of motion picture art: directing, acting, editing, tempo, rhythmicity.</td>
</tr>
<tr>
<td>THA 380</td>
<td>Directing I (3)</td>
<td></td>
<td>Fundamental principles of play-directing; demonstrations of theory in group exercises. Each student is required to direct two short scenes for laboratory presentation and criticism. (Laboratory hours to be arranged, and work in departmental productions).</td>
</tr>
<tr>
<td>THA 381</td>
<td>Scene Design I (3)</td>
<td></td>
<td>Study and practice of scene design; perspective drawing, fundamentals of design, and techniques of scenic painting. (Service on crews as required).</td>
</tr>
<tr>
<td>THA 382</td>
<td>Stage Lighting (3)</td>
<td>Junior standing.</td>
<td>Study of stage lighting techniques, practices, and equipment. (Service on light crew is required).</td>
</tr>
<tr>
<td>THA 421</td>
<td>Dramatic Theory (3)</td>
<td>Consent of Instructor.</td>
<td>The theory and philosophy of the theatre; analysis of various types of plays, both modern and historical, from the point of view of their production on a stage.</td>
</tr>
<tr>
<td>THA 422</td>
<td>High-School Play Directing (3)</td>
<td></td>
<td>Introduction to the theory and practice of directing and producing, with particular emphasis upon methods practicable in high-school and junior-college play production.</td>
</tr>
<tr>
<td>THA 423</td>
<td>Contemporary Theatre and Drama (3)</td>
<td></td>
<td>Trends in theatrical production and dramatic literature in Italy, France, Germany, Russia, and the Scandinavian countries.</td>
</tr>
<tr>
<td>THA 424</td>
<td>An Aesthetic of the Motion Picture (3)</td>
<td>Consent of Instructor.</td>
<td>An aesthetic consideration of the motion picture as art; critical criteria and stylistic comparisons will be established through viewing of films, reading assignments, and discussion.</td>
</tr>
<tr>
<td>THA 425</td>
<td>Dramatic Criticism (3)</td>
<td>Consent of Instructor.</td>
<td>Analysis of the nature of past and present day criticism of the drama; practical work in such criticism.</td>
</tr>
<tr>
<td>THA 480</td>
<td>Directing II (3)</td>
<td></td>
<td>Further theories and techniques of play direction, study of dramatic values, plot structure, style, mood, composition, and directing approach. Each student will direct scenes in class and laboratory and serve as assistant director or stage manager on a major production.</td>
</tr>
<tr>
<td>THA 481</td>
<td>Acting II (3)</td>
<td></td>
<td>Study and practical experience in creating roles in plays of different types, style, and period, with emphasis on developing flexibility of actor's equipment. (Laboratory hours to be arranged and work in departmental productions).</td>
</tr>
<tr>
<td>THA 483</td>
<td>Advanced Scene Design (3)</td>
<td></td>
<td>A continuation of THA 381 in which the emphasis is placed on independent planning and execution of a scene design. The student will be expected to work with the production group on a selected production.</td>
</tr>
<tr>
<td>THA 486</td>
<td>American Theatre and Drama: Eighteenth and Nineteenth Centuries (3)</td>
<td></td>
<td>An examination of the social, cultural and economic influences on the American drama and theatre. Trends in theatrical production and dramatic types, Revolutionary Drama, Social Comedy, Romantic verse Drama, ethnic characters, and Naturalism.</td>
</tr>
<tr>
<td>THA 487</td>
<td>American Theatre: Twentieth Century (3)</td>
<td></td>
<td>A continuation of THA 486, with emphasis placed upon the aesthetic and literary development of the theatre in this century. The New Stagecraft, Agitprop Theatre, Federal Theatre, Anti-war drama, the Absurdist and the avant-garde theatres will be dealt with in detail.</td>
</tr>
<tr>
<td>THA 488</td>
<td>Creative Dramatics and Children's Theatre (3)</td>
<td></td>
<td>An introduction to the aesthetical and psychological bases of theatre production for and by young people. The production of children's theatre, play selection, scenery, costumes, management, and touring.</td>
</tr>
<tr>
<td>TRAN 100</td>
<td>Transportation Planning (3)</td>
<td></td>
<td>Study of the theory and practice of planning for transportation systems. (Service on crews as required).</td>
</tr>
<tr>
<td>TRAN 101</td>
<td>Transportation Pricing and Policy (3)</td>
<td></td>
<td>Study and practice of planning for transportation systems. (Service on crews as required).</td>
</tr>
<tr>
<td>TRAN 301</td>
<td>Principles of Transportation (5)</td>
<td></td>
<td>Study and practical experience in problems of creating characterization, with emphasis on developing flexibility of actor's equipment.</td>
</tr>
<tr>
<td>TRAN 301</td>
<td>Transportation Pricing and Policy (3)</td>
<td></td>
<td>Study and practical experience in problems of creating characterization, with emphasis on developing flexibility of actor's equipment.</td>
</tr>
<tr>
<td>TRAN 401</td>
<td>Transportation Pricing and Policy (3)</td>
<td></td>
<td>Study and practical experience in problems of creating characterization, with emphasis on developing flexibility of actor's equipment.</td>
</tr>
<tr>
<td>ZOOL 100</td>
<td>General Zoology (3)</td>
<td></td>
<td>Study of the nature and classification of plants and animals. (Recommended for students majoring in English and preparing to teach literature).</td>
</tr>
<tr>
<td>ZOOL 200</td>
<td>Comparative Vertebrate Anatomy (3,3)</td>
<td></td>
<td>Comparative Vertebrate Anatomy (3,3) Study of the nature and classification of plants and animals. (Recommended for students majoring in English and preparing to teach literature).</td>
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<tr>
<td>ZOOL 400</td>
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</tbody>
</table>

*May not be offered before 1971.*
ZOOI 310 Histological Technique (4)
PR: ZOOI 100 or consent of instructor. Preparation of tissues for microscopic study; paraffin and cryostat methods; use of microtome; staining procedures; whole mounts.

ZOOI 320 Comparative Vertebrate Embryology (5)
PR: ZOOI 100 and preferably ZOOI 220-221. Embryology of the vertebrates; fertilization of egg; stage of cleavage; development of organs and systems.

ZOOI 322 Vertebrate Histology (4)
PR: ZOOI 100. Anatomy, structure and function of major cell types and tissues.

ZOOI 330 Animal Physiology (5)
PR: ZOOI 100 and junior standing. Function and interrelationships of nervous, endocrine, muscle, reticulo-endothelial, reproductive, excretory, respiratory, and digestive systems; immunology, teratology.

ZOOI 340 Taxonomy of the Vertebrates (4)
PR: ZOOI 100. A survey of the common elements of the vertebrate fauna suitable for non-biologists and potential teachers.

ZOOI 345 General Entomology (4)
PR: ZOOI 100. Introduction to insects; their identification, biology and ecology.

ZOOI 350 Animal Ecology (4)
PR: ZOOI 100 and 11 hours in the biological sciences. Effects of environmental factors on various vertebrate and invertebrate groups.

ZOOI 355 Game Conservation and Management (3)
PR: ZOOI 100. Principles of conservation and management; habitat improvement; wildlife techniques; public relations.

ZOOI 370 Animal Parasitology (5)
PR: ZOOI 100. Identification and life histories of representative parasitic protozoa and helminths emphasizing host-parasite relationships; techniques of animal examination; emphasis on human parasites.

ZOOI 400-401 Advanced Animal Biology (2,5)
PR: ZOOI 100 and junior standing. Selected topics in animal biology; modern zoological theory and principles; recent research.

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

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

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

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

EDPE 321 Exercise Physiology - Cardiovascular (5)

JRN 422 Public Affairs Reporting (3)
PR: JRN 420 or permission of instructor. Study of community news sources, reporting courts, city and county government.