

## **EARTH SCIENCE (E S)**

- 220-3 Geographic Information Systems for the Sciences. (2-3)** Applications of geographic information systems in the geological, environmental, earth, and other sciences. Laboratory exercises will apply GIS programs to geological and environmental problems. Course fee \$15.
- 320-3 Astronomy. (3-0)** A study of astronomical instrumentation and methodologies, a survey of the solar system, star evolution, cosmology and the origins of the universe, and a review of galactic types and histories. Theory reinforced by field experience. Prerequisite: Junior level standing. Course fee \$15.
- 330-3 Meteorology. (3-0)** A study of the Earth's atmosphere and the basic principles of weather analysis, climate and climatic controls, with emphasis on climatic effects on man. Theory reinforced by practical field experience. Prerequisite: Junior level standing. Course fee \$10.
- 340-3 Oceanography. (3-0)** A study of our oceans from the physical, chemical, biological, and geological aspects. Theory reinforced by practical field experience. Prerequisite: Junior classification or approval of department head. Course fee \$40.
- 350-3 Environmental Science. (3-0)** Integration of existing knowledge of geological, hydrological, and environmental processes associated with environmental management and land-use planning issues; including discussions of surface and subsurface water quality and quantity, soil erosion, solid and liquid waste disposal and flooding. Case studies involving environmental impact analysis. Prerequisites: GEOL 105, 107; CHEM 105, or approval of department head. Course fee \$10.
- 413-3 Environmental Techniques. (2-3)** A survey of techniques used in environmental investigations focusing on sampling and geochemical methods important to the environmental industry. Topics to be covered may include topographic surveying, geochemical sampling in surface waters and groundwater, soil sampling and site characterization. Prerequisites: GEOL 105, 314, MATH 109, AGRN 301 or approval of department head. Lab fee \$10.
- 484-3 Earth Science Internship. (1-8)** Pre-approved and supervised work experience in an environmental or earth science position in industry or the public sector. Prerequisite: Junior classification and approval of department head. Field experience fee \$50.
- 486-v Problems. (Credit variable)** A course open to capable Earth Science and Geology students. Topics may vary according to student need. May be repeated for credit, subject to the approval of the department head. Prerequisite: Approval of department head.

## **ECONOMICS (ECO)**

- 101-3 Introduction to Economics. (3-0)** In this course students are encouraged to use their common sense to understand economic principles and applications. Topics include scarcity, markets, economic goals, government policy, and international trade. This course is designed for students majoring in fields other than business or economics and for students who need a basic review prior to taking ECO 201 or 202. Course cannot be counted toward a degree in economics.
- 201-3 Principles of Economics: Macro. (3-0)** This course focuses on the aggregate or overall economy. Topics include the description and measurement of economic aggregates; the basic theories of output, employment and prices; the monetary economy and the role of government.
- 202-3 Principles of Economics: Micro. (3-0)** The major emphasis of this course is on the understanding of markets. Topics include an in-depth study of supply and demand, cost theory, economic resource markets, international trade, and the determination of foreign exchange rates. Prerequisite: ECO 201 or instructor's approval.
- 205-3 Consumer Economics. (3-0)** Designed to make the student an intelligent consumer of goods and services in the current economy. Major topics addressed are role of consumer in our economy, influences on consumer spending, fraud, use of consumer's monies, and consumer legislation. Credit for both H S 205 and ECO 205 will not be awarded.
- 301-3 Intermediate Macroeconomics. (3-0)** This course extends the study of the aggregate economy introduced in Economics 201 with emphasis on theory. Topics include the Classical and Keynesian systems, general equilibrium theories, economic growth, and public policy in a global setting. Prerequisite: ECO 201.
- 302-3 Intermediate Microeconomics. (3-0)** This course represents a more advanced study of microeconomic theory than is possible in Economics 2023. Topics include consumer behavior, production and cost theory, market structure, and factor markets. Prerequisite: ECO 202.
- 303-3 Money and Banking. (3-0)** A study of the structure and functions of financial markets and financial intermediaries; the behavior and pattern of interest rates; the basic concepts of commercial bank management; the nature of money and the role of the Federal Reserve in its creation; the basic structure of the economy and the impact of monetary actions on this structure. Prerequisite: ECO 201.
- 304-3 Environmental Economics. (3-0)** The study of the economics of the natural environment. Economic tools and issues such as social cost, externalities, cost-benefit analysis, property rights, and state and federal environmental policies will be examined with emphasis on problems associated with water pollution, waste disposal, and society's burden of social costs. Prerequisite: 3 hours ECO or A EC 105.
- 305-3 Economics of Financial Markets. (3-0)** A study of the aggregate financial system and capital markets and the impact these have on financial intermediaries. Topics to be covered are: flow of funds analysis, interest rate

theory, role of financial intermediaries, and management of financial assets. Credit for both FIN 304 and ECO 305 will not be awarded. Prerequisites: FIN 301, ECO 303.

- 306-3 Political Economy. (3-0)** A study of the historical, philosophical, and theoretical relationships between the state and the economy. Credit for both POLS 306 and ECO 306 will not be awarded. Prerequisite: 3 hours of ECO and 6 hours of POLS or instructor's approval.
- 401-3 International Economics. (3-0)** An introduction to international economic theory and policy, the foundations of modern trade theory and its extensions, welfare effects of tariffs and non-tariff barriers, commercial policies of the United States, trade policies of developing countries, multinationals, balance of payments, and foreign exchange markets. Credit for both ECO 401 and A EC 402 will not be awarded. Prerequisite: 3 hours ECO or A EC 105.
- 402-3 Economic Development of the United States. (3-0)** A survey of the economic development of the United States from colonial times to the present. Credit for both ECO 402 and HIST 402 will not be awarded. Prerequisites: ECO 101 or 201 and 6 hours HIST.
- 421-3 Economic Development of Rural Areas. (3-0)** Economic problems of rural areas in the United States. Review of fundamental causes of economic decline in rural areas. Application of economic principles and theory to problems of rural areas. Evaluation of current methods and public programs for economic development. Application of analytical methods to development problems. Credit for ECO 421 and A EC 421 will not be awarded. Prerequisite: A EC 205 or ECO 202.
- 465-3 Intermediate Economics. (3-0)** Seminar discussion of the American free enterprise system, the nation's economy and its strengths and weaknesses; critical examination of professional journals, articles, books and reports by the government and private sources, designed to enable the student to coordinate and apply the analytical knowledge acquired during the period of study. Prerequisites: Macroeconomics and microeconomics, college algebra or MATH 309, or permission to enroll.
- 485-v Economics Seminar. (Credit variable)** Content varies according to departmental needs, current/pertinent topics. Comprehensive reading is required. Conference and written reports are required of the reading assignments. Prerequisites: Junior or senior classification, 12 hours of ECO or approval of department head. May be taken more than once for credit.
- 486-v Problems. (Credit variable)** Independent reading, research and discussion. Entry into this course will be arranged with the Economics counselor.
- 502-3 Instruction of Basic Economics. (3-0)** Combines emphasis on understanding and teaching of basic economic principles such as demand and supply, fiscal and monetary policies, and international trade. The course also reviews educational resources and instructional methods in economics.
- 508-3 Managerial Economics. (3-0)** Applies economic theory and methodology to business and administrative decision-making. The tools of economic analysis are demonstrated and their use in formulating business policies is explained. Topics include concepts of profits, production and cost functions, demand theory, competitive pricing policies, and business criteria for investment output and marketing decisions. Prerequisite: Approval of MBA Director. Credit for both FIN 508 and ECO 508 will not be awarded.
- 559-3 Economic Applications and Issues. (3-0)** Seminar examination of the application of economic theory in the firm (micro) and in the overall economy (macro); in-depth research and analysis of current economic issues through critical examination of the professional literature and the current environment of business government. Prerequisite: ECO 465 Intermediate Economics or Micro and Macroeconomics.
- 564-3 Seminar on Global Commerce. (3-0)** Focuses on global competitive challenges facing business management teams. Students will evaluate how companies have strategically entered and developed international markets and managed global diversification. Students will learn to analyze international market potential, assess business risks and become familiar with institutions and national policies directing international trade. Prerequisite: ECO 465 Intermediate Economics or Micro and Macroeconomics
- 586-v Problems. (Credit variable)** This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest; directed reading of a number of sources selected in concert by the student's professor. Prerequisite: Approval of department head.

## EDUCATION (EDU)

**Note: Prior to enrolling in any teacher education course work, students must complete 60 hours of coursework.**

- 330-3 Professional Development I: An Introduction to Teaching. (3-2)** An introduction to the professional practices of teachers, including models of instruction, effective teaching practices, applications of educational technology, and the basic principles of classroom management. Required: Handbook for Teacher Certification and documentation of field experiences. Prerequisites: Junior classification and passing scores on all parts of the TASP or approval of department head.
- 335-3 Professional Development II: Learners and the Learning Environment. (3-3)** An examination of classroom practices appropriate for diverse learners. Topics will include modifying instruction, measurement and assessment, and demonstration of effective teaching practices. Required: documentation of field experiences. Prerequisites: EDU 330, PSY 303, and admission to the Tarleton Teacher Education Program, or approval of department head.

- 394-3 Curriculum and Methods for Early Childhood through Grade Four I: Language Arts, Social Sciences, and Fine Arts. (3-0)** An examination of developmentally appropriate educational strategies and instructional techniques in teaching language arts, social studies, and fine arts to children (preschool–4<sup>th</sup> grade). Students will be expected to integrate language arts, social studies, and fine arts within the curriculum as well as evaluate curricula materials. Prerequisites: Junior classification and completion of TASP requirement; RDG 311, SOSC 301, and F A 135.
- 396-3 Curriculum and Methods for Early Childhood through Grade Four II: Mathematics and Science. (3-0)** An examination of developmentally appropriate educational strategies and instructional techniques in teaching mathematics and science to children (preschool–4<sup>th</sup> grade) within a problem-based learning approach. Special topics include the appropriate use of technology and cooperative grouping and the integration of curriculum within the content areas of mathematics and science. Prerequisites: MATH 303 and 305, P SC 101, BIOL 210, admission to the Teacher Education Program, and concurrent enrollment or completion of EDU 335.
- 404-3 Early Childhood Environments. (3-4)** A study of all aspects of classroom management, including the physical environment and use of centers, for diverse groups of early elementary students. Current issues related to early childhood education will be examined. Students will be expected to demonstrate developmentally appropriate effective teaching practices in field-based setting. Prerequisites: Admission to Teacher Education Program, EDU 335, RDG 384, and EDU 394. Concurrent enrollment in EDU 396. Field experience fee \$50.
- 430-3 Professional Development III: Application of Effective Teaching Practices. (3-4)** Field-based experiences are provided in school settings where students will plan and deliver units of instruction, examine various models of instruction, analyze classroom management strategies, and demonstrate competencies in effective teaching practices. Prerequisites: EDU 335 and RDG 351, or approval of department head.
- 435-3 Professional Development IV: Issues in Professional Development. (3-0)** To be taken with Practicum in Teaching. Students synthesize and validate concepts encountered during teaching practicum. Focuses on professional issues related to teaching and the school environment. Prerequisites: Admission to Practicum in Teaching and concurrent enrollment in EDU 4906, or approval of department head.
- 483-3 Internship for Classroom Teaching. (1-9)** This internship includes supervised, field-based activities in public school classrooms. Major emphasis is placed on the development of instructional strategies and professional practices designed to improve teaching performance. Students are required to conduct a reflective analysis of their teaching performance. May be repeated for credit. Prerequisite: Admission to the Teacher Education Program. Field experience fee \$50.
- 486-v Education Problems. (Credit variable)** A course featuring independent research, reading, and discussion under personal direction of instructor, topics vary according to student need. Open to students of junior or senior classification who have been admitted to the Teacher Education Program and with approval of department head.
- 490-6 Practicum in Teaching. (1-18)** Supervised practicum in teaching in the public schools at the appropriate level. Students are required to demonstrate proficiency in the application of effective teaching practices and classroom management strategies. Prerequisite: Admission to Practicum in Teaching or approval of department head. Field experience fee \$50.
- 501-3 Readings in Professional Development. (3-0)** An examination of current issues in the professional development of educators. Topics include models of professional development, impact of professional development on public school student achievement, effective evaluation of professional development, and identification of best practice in writing and evaluating research with an emphasis on literature reviews.
- 502-3 Educational Sociology. (3-0)** A study of the multicultural dimensions of society and the relationship between a multicultural society and the public school system. The social functions of education, the nature of school culture, and the use of sociological principles for future forecasting will be studied.
- 504-3 Human Development. (3-0)** Increasing the understanding of human behavior with emphasis on the child, adolescent, and adult learner. Development of insight and social and cultural forces in the formation of personality, the self, and roles in group membership.
- 506-3 Adult Education. (3-0)** Examines the philosophy and concepts of adult education including the role of the adult educator, setting of objectives, integration of adult learning with career goals or changes and assessment of educational needs of adults.
- 510-3 Foundations of Elementary and Middle School Curriculum. (3-0)** A study of the elementary and middle school curricula, including English language arts and reading; mathematics; life, earth and physical science; social sciences; fine arts; health and physical education. Additional topics include the state adopted curriculum, local school instructional programs and national/state assessment programs. Field experience is required. Prerequisites: admission to the College of Graduate Studies; pending admission to the alternative teacher certification program at Tarleton.
- 511-3 Methods of Effective Teaching. (3-2)** A study of the research on effective teaching practices with an emphasis on direct instruction. Additional topics of study include mastery learning, assessment of learning and use of assessment to guide instruction. Students will apply technology and effective teaching practices to the design and delivery of instruction. Technology lab is required. Prerequisite: admission to the alternative teacher certification program at Tarleton. Lab fee \$10.

- 512-3 Seminar in Teaching Language Arts and Social Studies. (3-0)** An integrated approach to teaching Social Studies through the application of the writing process, reading/writing connections, and children's literature. Prerequisite: 18 hours of professional education course work.
- 514-3 Creating and Managing the Learning Environment. (2-3)** A study of the research on creating and maintaining a positive learning environment. Additional topics for study include: cultural dimensions of classroom management; motivating student achievement; fostering cooperation among students; reinforcing appropriate behavior; ethics and law governing teacher-student relations. Students will apply teaching and classroom management practices in a clinical laboratory setting. Prerequisite: admission to the alternative teacher certification program at Tarleton. Course fee \$15.
- 520-3 Issues in the Education of Children. (3-0)** The examination of issues related to the education of young children. Course content includes: applying stage development and learning theories to develop instructional strategies and classroom management practices; cultural and individual differences; teaching English language learners and learners with special needs. Prerequisite: admission to the alternative teacher certification program at Tarleton.
- 521-3 Issues in the Education of Adolescents. (3-0)** The examination of issues related to the education of adolescents. Course content includes: applying stage development and learning theories to develop instructional strategies and classroom management practices; cultural and individual differences; the adolescent subculture and factors that place adolescents at risk; teaching English language learners and learners with special needs. Prerequisite: admission to the alternative teacher certification program at Tarleton.
- 522-3 Teaching Math and Science in the Elementary School. (3-0)** An advanced study of methods and materials for the teaching of math and science. Emphasis will be on helping teachers become more effective in teaching math and science by developing questions, investigations, speculations, and explorations that reflect not only the content of each area of study, but the process involved in learning.
- 534-3 Curriculum for Early Childhood Programs. (3-0)** An advanced study will be made of early childhood education curriculum and practices. An examination will be made of current trends in early childhood curriculum with an emphasis on the modifications needed to ensure the success of all young children. Prerequisite: 18 hours of professional educational course work.
- 538-3 Curriculum Design and Implementation. (3-0)** The curriculum selection, design, implementation, and evaluation processes within the classroom and school district settings are examined. Factors that influence the curriculum decision-making process and a review of theories of curriculum development will be researched. Curriculum alignment and curriculum auditing will be major emphases of this course.
- 545-3 Advanced Instructional Strategies. (3-0)** The derivation of appropriate methods and techniques from basic principles of learning. The development of working skills needed in cooperative planning, selecting, and organizing teaching materials, utilization of the environment, individual and group guidance, and evaluation activities.
- 550-3 Assessment Issues for Educational Leaders. (3-0)** The examination of assessment as a process with emphasis on assessment of student achievement and on data interpretation for the purpose of improving instruction.
- 560-3 The Gifted Learner. (3-0)** An in-depth study of the characteristics and needs of gifted and talented students as they relate to both school and family settings. Different models and programs for gifted education will be studied. Formal and informal identification procedures will be examined in line with federal and state guidelines.
- 562-3 Creativity in the Classroom. (3-0)** A study of the theories and models of creativity. Emphasis will be given to identifying the creative potential of students in all classrooms. Instructional processes which accommodate the needs of creative learners will be examined and developed. Prerequisite: EDU 560.
- 564-3 Curriculum and Materials Development for the Gifted Learner. (3-0)** A comparison of regular and gifted curricula with a focus on developing an interdisciplinary curriculum for gifted learners. Students will examine and evaluate existing materials and equipment which support instruction for the gifted in both regular and special programs. One focus will be on developing and evaluating teacher constructed materials. Prerequisite: EDU 560.
- 566-3 Instructional and Evaluation Methods for the Gifted Learner. (3-0)** Methods of determining specific learning styles and talents will be learned, with emphasis placed on implementing appropriate instruction for programs. Methods and tools of informal and formal evaluation and assessment will be examined. Prerequisites: EDU 560 and 564.
- 569-3 Practicum in Gifted Education. (1-7)** Supervises professional activities in gifted and talented programs. Students will be required to demonstrate competence in the process of delivering a synergistic gifted and talented program. Prerequisites: Successful completion of EDU 560, 562, 564, and 566. Field experience fee \$50.
- 585-v Education Seminar. (variable)** Presentation of project proposal, implementation, and conclusions. Must be repeated a minimum of 3 times for 1 hour credit each semester to complete masters project. Student must be continuously enrolled until the graduate project is completed.
- 586-v Special Problems. (variable)** Open to graduate students who are capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor. Prerequisite: Graduate major in Education.

- 588-3 Thesis. (3-0)** Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: EDU 598, 557, and consent of major professor.
- 590-v Selected Topics in Education. (variable)** An examination of different topics each semester with a focus on such subjects as the gifted student, the education of culturally disadvantaged, teacher evaluation, or other selected topics concerning the teaching/learning process. This semester may be repeated for credit as topic changes. Prerequisite: Permission of instructor.
- 593-3 Internship in Elementary Teaching. (1-7)** This course includes supervised professional activities in the elementary public school classroom. Major emphasis is placed on the development of instructional strategies and professional practices designed to improve teaching performance. Students are required to conduct a reflective analysis of their teaching performance, engage in field research activities, and attend periodic meetings on campus. Prerequisites: Admission to a teacher education program at Tarleton State University or employment as a teacher of record in a public school in Texas. Field experience fee \$50.
- 598-3 Techniques of Research. (3-0)** Fundamental concepts and tools of research applied to psychological and educational problems. Rationale of research, analysis of problems, library skills, sampling, appraisal instruments, statistical description and inference, writing the research report, and representative research designs.
- 599-3 Internship in Teaching. (1-40)** A supervised field-based experience in classroom teaching. Interns must demonstrate proficiency in applying effective teaching practices and classroom management strategies in a school classroom. Prerequisite: admission to a teacher certification program at Tarleton; satisfactory performance in the professional development courses preceding the internship. May be repeated for credit. Field experience fee: \$50.

### **EDUCATIONAL ADMINISTRATION (EDAD)**

- 500-3 Foundations in Educational Administration. (3-1)** An introduction to educational administration. This course provides an overview of the role of school administrators in today's public schools. Included are an assessment of the knowledge and skills as identified by the State Board for Educator Certification and the development of a professional growth plan. Prerequisite: Admission to the Educational Administration program. Lab fee \$5. Course fee \$5.
- 501-3 Techniques of Research and Evaluation. (3-0)** Class participants will learn the fundamentals of research, its terminology, principal designs, some of the hazards, how to collect and analyze research data, and distinguishing features of qualitative and quantitative research paradigms. Methods of program evaluation and psychometric qualities of measurement will be treated extensively.
- 507-3 Programs and Procedures in Supervision. (3-0)** Designed for teachers, supervisors, and administrators. Philosophy, organization, and administration of supervision of both elementary and secondary schools. Prerequisites: Admission to Educational Administration Program and EDAD 500 or approval of department head.
- 509-3 Public School Laws. (3-0)** Constitutional provisions, statutory laws, court decisions, and regulations governing public schools with special reference to Texas and federal relationships. Prerequisite: EDAD 500 or approval of department head.
- 510-3 Special Education Law. (3-0)** Legal framework for special education in the United States; consideration of federal constitutional provisions, federal and state statutes, federal and state judicial decisions and rules and regulations for the various federal and state agencies which affect special education.
- 516-3 Instructional Leadership. (3-0)** A study of the instructional leader's duties and responsibilities. The course will review effective teaching practices as well as identify the instructional leader's role in classroom observations, conferencing teachers, and developmental supervision. This course meets the Texas Education Agency requirements for instructional leadership training. Prerequisites: PSY 504 and EDAD 500 or approval of department head
- 539-3 Processes in Educational Leadership. (3-0)** Analysis of skills and techniques of administrators on modern schools, with emphasis on democratic leadership, teacher-administrator and relationships, group processes, and evaluation of administrative programs. Techniques of curriculum change and innovation. Prerequisite: EDAD 500 or approval of department head.
- 540-3 School-Community Relationships. (3-0)** Systems of interpretation of schools to community publics. Promotion of effective school-community relations through media of communication.
- 542-3 Financial Management for the Campus Principal. (3-0)** A study of the fiscal and operational responsibilities of the campus principal, including an overview of the Texas school finance system. Detailed emphasis is placed on budget development and management, accounting procedures, and sound fiscal planning and practice. Prerequisites: EDAD 500 or approval of department head.
- 588-3 Thesis. (3-0)** Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: completion of all other coursework required for the degree and consent of the major professor or approval of the department head.
- 586-v Special Problems. (variable)** Open to graduate students who are capable of developing a problem independently. Problems are chosen by the student and approved in advance by the instructor. Prerequisite: Full admission into the College of Graduate Studies and a graduate degree or certification program.

- 590-3 Selected Topics in Educational Administration. (3-0)** An examination of different topics each semester with a focus on contemporary issues in Educational Administration and leadership. This course may be repeated for credit as the topic changes.
- 597-3 Internship for the Superintendent. (1-7)** Supervised professional activities in the area of the public school superintendency. Intern will be required to demonstrate competencies in the performance of appropriate professional duties as culminating experiences in the Superintendency Program. Prerequisite: Completion of the professional courses in the Superintendency Preparation program or approval of department head. Field experience fee \$50.
- 599-3 Internship for the Principalship. (3-0)** Supervised professional activities in the area of the public school principal, including elementary and secondary principalships and the central office administrator. Intern will be required to demonstrate competence in the performance of appropriate professional duties as the culminating experience in the principal certification program. Students must complete the educational administration core prior to enrolling in the internship. The internship course is typically a one-semester course; however, this course may be repeated so that the student can satisfactorily complete internship requirements. No more than 3 semester hours of internship course work can be used to satisfy certification plan requirements. Prerequisite: Completion of the educational administration core or approval of department head. Field experience fee \$50.
- 601-3 Public School Finance and Fiscal Management. (3-0)** The principles of school finance, budgeting, and accounting procedures. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head. Field Experience fee \$50.00.
- 602-3 Administrative Law and Personnel Administration. (3-0)** A comprehensive study of public school law as it relates to contractual and at-will personnel. Emphasis is placed on advertising, interviewing, selecting, and evaluating personnel. Special attention is given to Equal Employment Opportunity guidelines, Federal Right to Privacy Act, employee contracts, and records. Additional attention is given to employee induction and student record. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head. Field Experience fee \$50.00.
- 603-3 The School Superintendency. (3-0)** A detailed study of the multiple roles and responsibilities of the chief school administration, including the leadership role with the community, school board, professional staff, and students. Some observations and activities in the public schools and community will be required. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head. Field Experience fee \$50.00.
- 604-3 Educational Planning and Facility Development. (3-0)** Study of major administrative systems in public schools including transportation, distribution and food service systems, energy management, health services, security, and safety-related issues. Topics also include the study of present and future building and equipment needs of public school systems, including operations, maintenance, and planning for new facilities. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head. Field Experience fee \$50.00.
- 605-3 Instructional Development and School Improvement. (3-0)** A study of research and state policy affecting instructional improvement in public school systems. Special emphasis on result-based accountability systems, including curriculum planning and evaluation, professional development, and student assessment processes. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head. Field Experience fee \$50.00.
- 610-3 Historical and Educational Foundations of Educational Leadership. (3-0)** This course will provide students an opportunity to study the philosophical, psychological, and sociological dimensions of educational administration in a historical, as well as, contemporary context. Prerequisite: Doctoral Standing.
- 611-1 Critical Issues in Educational Leadership. (1-0)** This course is to provide an opportunity to study a current and identified administrative problem in a specific school district or combination of districts. Topics include but are not limited to, future studies, brain-based learning, and strategic visioning and planning. With departmental approval this course may be repeated when problems or topics differ. Must be taken three times concurrently with residency. Graded on a satisfactory (S) or unsatisfactory (U) basis. Prerequisites: Doctoral Standing.
- 612-3 Methods of Educational Research. (3-0)** An overview of research methodology including basic concepts employed in quantitative and qualitative research methods. Includes computer applications for research. Prerequisites: Doctoral Standing
- 614-3 Philosophy and Ethics in Educational Leadership. (3-0)** This course will provide students an opportunity to apply the concepts of ethics and philosophy to the personal and professional aspects of school organization, operation, and leadership. Students will apply these concepts in fashioning reasoned decisions, thoughtful analyses, and in problem solving events. Prerequisites: Doctoral Standing.
- 621-3 Education Law and Policy. (3-0)** A thorough investigation of policy making processes and the interrelationship between legal and policy making processes at the national, state, and local levels. An in-depth examination of legal principles and laws affecting the administration and management of educational organizations. Prerequisite: Doctoral Standing.
- 622-3 Data Analysis and School Improvement. (3-0)** Emphasis on the fundamentals of inferential data analysis with computer applications, which will enhance abilities in the classroom and in administrative responsibilities. This

course will provide information, guidance, and models that will enable professional educators to develop effective evaluation and appraisal systems appropriate to their needs. Interpretation and application of assessment procedures and statistical concepts are emphasized in order for educators to facilitate decision-making and disseminate test results and educational evaluations to the community. Prerequisite: Doctoral Standing.

- 623-3 Theory & Practice of Organizational Leadership. (3-0)** The application of theories of organizational behavior to the problems of educational institutions. Through the examination and applications of theories, including but not limited to leadership, decision-making, communication, motivation, power and influence, group dynamics, and change, this course is designed to develop diagnostic and problem-solving skills necessary for successful leadership of educational organizations. Prerequisite: Doctoral Standing.
- 624-3 Advanced Studies in Educational Leadership. (3-0)** Exploration of a critical issue in the field of education from an interdisciplinary perspective; skills developed in analyzing an issue, exploring its impact upon diverse educational settings, formulating positions and seeking alternative solutions. Prerequisite: Doctoral Standing.
- 625-3 Methods of Inquiry I. (3-0)** The study of scientific inquiry defined by the Tarleton State University doctoral conceptual framework for investigating organizational behavior. Integrated research methodology, univariate/bivariate statistical designs, and program evaluation procedures represent both positivistic and post positivistic scientific reasoning. Psychometric properties of measurement will be included. Prerequisite: Doctoral Standing.
- 630-3 Educational Governance and Policies. (3-0)** An exploration of the impact of political processes on the development of educational policy, with an emphasis on federal and state policy development. A required one-week trip at the student's expense to Washington, D.C. will be one of the requirements necessary to meet the course objectives. Students will be responsible for student travel expenses determined by the instructor. Prerequisite: Doctoral Standing or approval of the department head.
- 631-3 Methods of Inquiry II. (3-0)** A continuation of inquiry as represented by the doctoral program conceptual framework with emphasis on individualized application. The course will emphasize integrated multivariate and advanced statistical design, and research paradigms. Participants will be expected to focus investigative methods to their major areas of interest in preparation for a doctoral dissertation proposal. Prerequisite: EDAD 625 and Doctoral Standing.
- 641-3 Administrative Leadership in Higher Education. (3-0)** A thorough investigation of higher education administration theory applied to the practice of performing academic duties combined with an in-depth examination of organizational influences that form the academic, political, legal, governmental, financial, and local framework involved in the administration and management of educational organizations. Prerequisites: Doctoral standing or approval of department head.
- 645-3 Comparative Higher Education Systems. (3-0)** This course is designed to explore and study key post-secondary educational systems, structures, and organizational issues in tertiary educational systems outside the United States. The course will address topics such as internal and external governance of post-secondary institutions, access to higher education, student affairs, academic personnel, curriculum, instruction, and educational reform in higher education systems in selected countries. Prerequisite: Doctoral Standing, or approval of department head.
- 685-3 Advanced Seminar in Educational Leadership. (3-0)** Design of research and inquiry in various areas of educational administration; application of models and research procedures from the social and managerial sciences to policy issues in educational organizations. Prerequisite: Doctoral Standing.
- 690-3 Selected Topics in Educational Leadership. (3-0)** An examination of different topics each semester with a focus on contemporary issues in educational leadership. This course may be repeated for credit as the topic changes. Prerequisite: Admission to the doctoral program in Educational Leadership.
- 699-3 Extended Internship in Educational Leadership. (3-0)** Supervised activities in a governmental, organizational, or higher education setting. During the extended internship, the student will be required to demonstrate competencies appropriate to the professional setting of the internship. Prerequisite: Doctoral Standing. Field experience fee \$50.
- 788-3 Dissertation. (3-0)** Scheduled when the student is ready to begin the thorough and scholarly investigation of a topic acceptable to the dissertation committee. To be acceptable, the dissertation must give evidence that the candidate has pursued a program of research, the results of which reveal superior academic competence and a significant contribution to the field. Graded on a satisfactory (S) or unsatisfactory (U) basis. Prerequisite: Doctoral Standing and successful completion of the doctoral qualifying examination.

## **EDUCATIONAL TECHNOLOGY (EDTC)**

- 300-3 Educational Technology I. (2-2)** This course will prepare students to use computers and related technologies in educational settings. Students will evaluate performance of hardware and software components of computer systems and apply basic troubleshooting strategies as needed. Students will apply tools for enhancing their own professional growth and productivity. They will use technology in communicating, collaborating and conducting research, and solving problems that typically arise in educational environments. Lab fee \$10.
- 400-3 Educational Technology II. (2-3)** Experiences will be provided in school settings where students can apply technologies to support instruction in various grade level and content areas. Students will also demonstrate

knowledge of selection, installation, management, and maintenance of the technology infrastructure in a classroom setting. Prerequisite: EDU 300 and admission to the Teacher Education Program or approval of department head. Lab fee \$10.

- 486-v Educational Technology Problems. (1 to 3-0)** A course featuring independent research, reading, application, and discussion under personal direction of Instructor; topics vary according to student need. Open to students of junior or senior classification who have been admitted to the Teacher Education Program and with approval of instructor and department head.
- 549-3 Educational Media and Technology. (2-2)** Examination of the role of technology in school settings. Focus is on systematic planning of instruction. Students will be expected to incorporate the effective use of technology to plan, organize, deliver, and evaluate instruction for all learners. Lab fee \$15.
- 559-3 Integration of Technology. (2-3)** Students will demonstrate the use of task-appropriate productivity tools to support the delivery of instruction and facilitate independent learning and groups in problem-solving situations and project-based learning activities. Prerequisite: EDTC 549 and CIS 501 or approval of department head. Lab fee \$15.
- 586-v Educational Technology Problems. (1 to 3-0)** Open to graduate students who are capable of developing a problem independently. Problems must be chosen by the student and approved in advance by the instructor and department head. Prerequisite: Full admission to the College of Graduate Studies and a graduate degree or certification program.

## **ENGINEERING (ENGR)**

- 111-3 Foundations of Engineering I. (3-2)** Introduction to the engineering profession, ethics, and disciplines; development of skills in teamwork, communication, problem solving, logic processing, design and visualization; computer applications including programming and CAD tools. Co-requisite: MATH 118 or 109. Course fee \$15. Lab fee \$10.
- 112-3 Foundations of Engineering II. (3-2)** Development of skills in problem solving, design, analysis, estimation, communication and teamwork; introduction to accounting and conservation principles in engineering sciences emphasis on computer applications and programming. Prerequisites: ENGR 111; MATH 120 or concurrent registration, PHYS 122 or concurrent registration. Course fee \$15. Lab fee \$10.
- 221-3 Principles of Engineering I. (3-2)** Unified presentation of conservation principles applied to engineering mechanics systems in statics and dynamics. Prerequisites: ENGR 112; PHYS 122; and MATH 209 or concurrent registration. Course fee \$15. Lab fee \$10.
- 222-3 Principles of Engineering II. (3-0)** Theory and application of energy methods in engineering; conservation principles to investigate "traditional" thermodynamics and internal flow fluids. Prerequisites: ENGR 112; MATH 209 or concurrent registration. Course fee \$15.
- 223-3 Principles of Engineering III. (3-2)** Description of properties of materials using a unified approach; discussion of the chemical structure, crystalline structure, microstructure, interface structure, and phase diagrams for materials; develop bulk properties and characteristics of metals, polymers, and ceramics; mechanical, electrical, magnetic, thermal, and optical properties for these materials. Prerequisites: ENGR 112; PHYS 122 and MATH 209. Course fee \$15. Lab fee \$10.
- 303-3 Engineering Economy. (3-0)** Principles of economics equivalence; time value of money, analysis of single and multiple investments; comparison of alternatives; capital recovery and tax implications; certainty; uncertainty; risk analysis; public sector analysis; and break-even concepts. Prerequisite: MATH 120 or concurrent registration.
- 460-3 Engineering Integration. (1-6)** Culminating design experience in the last year of the curriculum used to integrate the student's education. Includes reference to business concepts, mathematics, science, engineering and humanities. Emphasizes team work, a holistic approach to problem solving, and incorporates appropriate engineering standards and multiple realistic constraints. Prerequisites: Within one year of graduation, completion of at least 30 hours of engineering courses with a C or better. Completion of MATH 333 and MATH 306 with a C or better. Course fee \$15. Lab fee \$15.
- 486-v Special Problems. (Credit variable).** Directed study of selected topics in Engineering. May be repeated with approval of department head.

## **ENGINEERING PHYSICS (ENPH)**

- 225-4 Electrical Circuit Theory. (3-3)** Resistive circuits: circuit laws, network reduction, nodal analysis, mesh analysis; energy storage elements; sinusoidal steady state; AC energy systems; magnetically coupled circuits; the ideal transformer; resonance; introduction to computer applications in circuit analysis. Prerequisites: PHYS 242 or concurrent registration; MATH 209 or concurrent registration. Course fee \$15. Lab fee \$10.
- 248-4 Introduction to Digital System Design. (3-3)** Combinational and sequential digital system design techniques; design of practical digital systems. Credit for both C S 248 and ENPH 248 will not be awarded. Prerequisite: PHYS 242 or concurrent registration. Course fee \$15. Lab fee \$15.
- 314-3 Signals and Systems. (3-0)** Lumped linear passive and active circuit analysis by Laplace transformation methods; transient and steady-state response; two-port networks theory; Fourier series; Fourier transform; elementary feedback. Prerequisites: ENPH 225, MATH 306 or concurrent registration.

- 332-3 Electromagnetic Field Theory. (3-0)** Electrostatics; Laplace's equation; the theory of dielectrics; magnetostatic fields; electromagnetic induction; magnetic fields of currents; Maxwell's equations. Credit for both ENPH 332 and PHYS 332 will not be awarded. Prerequisites: PHYS 242; MATH 306 and MATH 333 or concurrent registrations.
- 343-4 Computer Architecture. (3-3)** Hardware and software structures found in modern digital computers. Instruction set architecture, hardwired design of the processor, assembly language programming, microprogramming, I/O and memory units, analysis of instruction usage, and hardware complexity. Credit for both C S 343 and ENPH 343 will not be awarded. Prerequisite: C S 248 or ENPH 248. Course fee \$15. Lab fee \$15.
- 345-4 Electronics. (3-3)** Introduction to electronic systems; linear circuits; operational amplifiers and applications; diodes, field effect transistors, bipolar transistors; amplifiers and nonlinear circuits. Prerequisite: ENPH 225. Course fee \$15. Lab fee \$10.
- 430-3 Math Methods for Physicists & Engineers. (3-0)** Mathematical techniques from the following areas: infinite series; integral transforming; applications of complex variables; vectors, matrices, and tensors; special functions; partial differential equations; Green's functions; perturbation theory; integral equations; calculus of variations; and groups and group representatives. Credit for both ENPH 430 and PHYS 430 will not be awarded. Prerequisite: MATH 306, MATH 333.
- 432-3 Microelectronic Circuit Fabrication. (3-0)** Fundamentals of MOS and bipolar microelectronic circuit fabrication; theory and practice of diffusion, oxidation, ion implantation photolithography, etch; yield and reliability considerations; statistical process control; integrated process design, simulation, and characterization. Prerequisites: ENGR 223, ENPH 345 and ENPH 436 or concurrent registrations. Course fee \$15.
- 436-3 Solid State Physics. (3-0)** The basic ideas of physics are applied to the understanding of the properties of crystalline materials to include the definition of such materials, electrical and thermal conductivity, heat capacity, crystalline binding, the nature of metals, insulators, and semiconductors, dielectric properties, and magnetic properties. Credit for both ENPH 436 and PHYS 436 will not be awarded. Prerequisite: PHYS 334; MATH 306 or concurrent registration.
- 441-4 Microprocessor System Design. (3-3)** Introduction to microprocessors; 8/16 bit single board computer hardware and software designs; chip select equations for memory board design, serial and parallel I/O interfacing; ROM, static and dynamic RAM circuits for no wait-state design; assembly language programming, stack models, subroutines and I/O processing. Credit for both C S 441 and ENPH 441 will not be awarded. Prerequisite: ENPH 248 or C S 248. Course fee \$15. Lab fee \$15.
- 443-4 Linear Control Systems. (3-3)** Application of state variable and frequency domain techniques to modeling and analysis of single input, single output linear control systems; physical implementation of control systems by integrating sensors, actuators and other control system components; use of software design tools. Prerequisite ENPH 314, MATH 306. Course fee \$15. Lab fee \$10.
- 486-v Special Problems. (variable)** Directed study of selected topics in Engineering Physics. May be repeated with approval of department head.

## ENGLISH (ENGL)

- 100-3 Basic Writing. (3-2)** Provides students with instruction in the basics of acceptable writing, with special focus on preparing them to succeed in the writing demanded throughout the Tarleton State University freshman composition sequence. The course helps students address writing problems by work in such areas as the composing process, arrangement, cohesion, paragraphing, syntax, and use of evidence. The course also helps students (on an individual basis) with their particular problems in grammar, usage, punctuation, and spelling. A student must earn a grade of at least C in order to progress to ENGL 111. The course will not substitute for any other course and does not count for degree credit. Course fee \$10.
- 111-3 Introduction to College Composition. (3-0)** A prerequisite to English 112, the course introduces students to the diverse characteristics of writing for academic contexts. Students in English 111 *write about ideas*, in particular responding analytically and critically to written sources. The course helps students become familiar with academic audiences, situations, purposes, genres, and some primary conventions (style, arrangement) of those genres. Moreover, students work to develop their own composing processes, particularly for ways of inventing ideas, planning, and revising their texts. Course fee \$5.
- 112-3 College Composition and Research. (3-0)** A sequel to English 111, this course introduces students to research in academic contexts. Students address questions such as *What is it for? What are its limitations? What are some of its shapes? How does one go about it?* The course introduces students to a variety of research methods, systems of documentation, contemporary library resources, and research genres. Among other writing tasks for the course, each student is expected to carry out his/her own research study for possible publication in *The Tarleton Freshman Writer*. Prerequisite: ENGL 111. Course fee \$5.
- 210-3 The Short Story. (3-0)** This course provides a study of narrative, including folktales and emphasizing 19<sup>th</sup> and 20<sup>th</sup> century short stories. Extensive reading and analysis of stories leading to an understanding of the narrative impulse and the possibilities of this literary form. Prerequisites: ENGL 111 and 112.

- 220-3 Introduction to Literature. (3-0)** A genre-based study of predominantly modern literary works. Students will analyze form and content with particular emphasis on the vocabulary and techniques germane to literature, investigate its attendant treatment as an academic discipline, and explore its aesthetic connections to human experience. Prerequisites: ENGL 111 and 112.
- 240-3 Literature and Film. (3-3)** A study of styles, components, and techniques of literary genres, with particular attention to the medium of film as it relates to literary expression. Weekly lab meetings will entail screening of films appropriate to class discussion and analysis. One 3-hour lab per week required. Prerequisite: ENGL 111 and 112 or prior approval of department head. Course fee \$10.
- 250-3 Backgrounds of Western Literature. (3-0)** A study of major works in translation which provide the foundation for the literary tradition of the modern Western world, emphasizing, but not limited to, the Ancient World, the Middle Ages, and the Renaissance. Prerequisite: ENGL 111 and 112.
- 301-3 American Literature to 1865. (3-0)** From the beginnings to 1865. A critical survey of major writers and movements with emphasis upon such representative authors as Poe, Emerson, Hawthorne, Thoreau, Dickinson, and Melville. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 302-3 American Literature Since 1865. (3-0)** From 1865 to the present. A critical survey of major writers and movements with emphasis on such representative authors as Crane, Howells, Frost, Hemingway, and Faulkner. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 309-3 Technical Writing. (3-0)** Process of developing technical information, including researching, drafting, editing, revising, and designing technical reports, proposals, manuals, job application documents and professional correspondence for specific audiences, using word processing and graphic applications. Prerequisites: ENGL 111 and 112. Course fee \$10.
- 310-3 Technical Writing and Editing. (3-0)** Study of advanced technical communication situations such as formal reports, grant proposals, and professional articles, and extensive discipline-specific professional level practice in these forms. Study of general editorial techniques in formats, graphics, and layout and design methods in technical publications. Prerequisites: ENGL 111, 112, and 3 hours sophomore ENGL, ENGL 309. \$10.
- 312-3 Graphics and Technical Writing. (3-3)** This course will examine the integration of graphic components in printed and electronic mediums. Students will use computer applications to compose and design graphics such as bar graphs, organizational charts, flow charts, diagrams, and drawings. Prerequisites: ENGL 111, 112, and 3 hours sophomore ENGL, ENGL 309. Course fee \$10.
- 320-3 Advanced Grammars. (3-0)** An introduction to the grammatical structure of modern English at the level of word, clause, and discourse presented through the application of the principles of descriptive grammars, accompanied by a review of current prescriptive grammars. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 330-3 Advanced Composition. (3-0)** Students will examine the rhetoric of composition through intensive writing workshops and close reading of composition-related texts. The goals of the course are (1) to discover and define some coherent relations between rhetoric and composition; (2) to challenge the students' presuppositions about essayistic space through a process of peer- and instructor-reviewed writing workshops. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL, or prior approval of department head.
- 341-3 Cultural Studies. (3-0)** This course explores an array of diverse cultural and historical contexts through literature produced outside the common British and American traditions. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 342-3 Genre Studies. (3-0)** Literary genres consist of related kinds of works, combining content and form, gradually changing as their cultures change. The purpose of generic study is an understanding of literary tradition and of the way in which authors speak to their times, and to all times, through the genres they inherit and modify. This course will provide an intensive study of one or more genres. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 343-3 Creative Writing. (3-0)** Focuses on the craft and art of writing narrative, poetic, and dramatic discourse. Attention to the conception, design, and execution both of the whole work and of elements of figurative language, characterization, dialogue, point of view, and poetic structure, as well as other elements of the craft. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 350-3 Children's Literature. (3-0)** A general survey of literature for children. Includes a study of types of literature for children and of the development of criteria for the selection and evaluation of children's books. This course may be counted as an elective but not towards the 24-hour advanced English requirement for an English major. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 370-3 An Introduction to Linguistics. (3-0)** A study of descriptive linguistics revealing the nature and scope of the characteristics and complexities of human language. Much of the course consists of learning the phonology, morphology, syntax, semantics, and pragmatics of modern English. Attention will also be focused on the nature and diversity of the rule-bound creativity underlying the tacit systematic use of human language. Prerequisite: ENGL 111, 112, and 6 hours sophomore ENGL.
- 390-3 Readings in Adolescent Literature. (3-0)** Survey of literature with a focus on teenage audiences. Readings will include both classics and contemporary selections. Study will be concerned with increasing student understanding of unique aspects of adolescent literature and its application in public school curricula. Prerequisites: ENGL 111, 112 and 6 hours sophomore ENGL.

- 395-1 Written Discourse Theory and Application. (1-0)** Students will receive instruction and training in written discourse theory and practice as appropriate and necessary preparation for tutoring in the University Writing Center and/or the English and Languages Department Language Arts Lab. Students must receive prior approval to enroll. Prerequisites: ENGL 111, 112, 6 hours sophomore ENGL, and approval of Writing Program Director and Writing Center Directors.
- 400-3 Shakespeare. (3-0)** An in depth study of representative types of Shakespeare's drama and poetry. Credit for both ENGL 400 and THEA 400 will not be awarded. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 401-3 British Literature I. (3-0)** A chronological study of the works of the principal authors and their historic backgrounds from approximately 700 A.D. to the end of the eighteenth century. The writers considered include Chaucer, Shakespeare, Milton, Pope, and Swift. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 402-3 British Literature II. (3-0)** A chronological study of the works of the principal authors and their historic backgrounds from the end of the eighteenth century to the present. The writers considered include Wordsworth, Coleridge, Tennyson, Browning, and Eliot. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 411-3 Studies in Rhetoric and Language. (3-0)** This course offers advanced study in the theory, nature, and practice of written discourse. Special emphasis is given to helping students investigate language theoretically as a background for their own professional and personal use. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 412-3 Technical Writing with Computer Applications. (3-0)** Study of and practice in use of word processing and desktop publishing in document design and publication. Prerequisites: ENGL 111, 112, 3 hours sophomore ENGL, ENGL 309, ENGL 312. Course fee \$10.
- 415-3 Senior Literary Seminar. (3-0)** This course offers an opportunity for students to engage in an intensified, focused, well-defined study. Possibilities include the examination of a particular writer, groupings of writers, a specific geographic region, and/or literary criticism. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 420-3 Writing for Electronic Mediums. (3-0)** Advanced study of and practice in writing for electronic mediums with a primary focus on planning, designing, and composing professional pages for the world wide web. Prerequisites: ENGL 111, 112, 3 hours sophomore ENGL, ENGL 309, 312. Course fee \$10.
- 435-3 Film Studies. (3-3)** A study of movies both as dramas – involving plot, characterization, theme, etc. – and as artistic productions – involving shots, cuts, and other film techniques. Other aspects of film criticism are covered. A three-hour lab per week is required. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL. Course fee \$10.
- 460-3 Advanced Studies in Secondary English. (3-0)** This course applies the standards of the National Council of Teachers of English to the curriculum of secondary English. It provides an intensive review of composition principles, language conventions, literary genres, and computer instructional technology. Prerequisites: ENGL 111, 112, and 6 hours sophomore ENGL.
- 486-v English Problems. (Credit variable)** A course featuring independent reading, research, and discussion under personal direction of instructor, topics to vary according to student need. Open to students of senior classification with prior approval of department head.
- 510-3 Studies in American Literature. (3-0)** Focuses on restricted periods in American literary history. Examples include colonial American literature, the American Renaissance, American literary naturalism, post-World War II American literature, and minority literature in America. May be repeated for credit when topics vary.
- 520-3 Studies in the English Language. (3-0)** Focuses on historical and/or linguistic study of the English language. Topics will vary. Examples include history of the English language and the English language in America. May be repeated for credit when topics vary.
- 530-3 Studies in Rhetoric. (3-0)** A study of written language theories. Course contents include readings from a wide spectrum including classical Greece and Rome, the European enlightenment, nineteenth century America, and modern and post-modern periods. May be retaken for credit when topics vary.
- 540-3 Studies in Modern Fiction. (3-0)** An evaluation of English and American short stories, novels, and related criticism. Topics will vary and will include study of themes and development of the genre. May be repeated for credit when topics vary.
- 550-3 Studies in Literature Before 1500. (3-0)** A study of representative types of pre-1500 literature in English. Topics may vary. May be repeated for credit when topics vary.
- 560-3 Modern American and British Poetry. (3-0)** A study of representative themes in the development of American and English poetry. Related critical readings will be studied. Topics will vary. May be repeated for credit when topics vary.
- 570-3 Studies in Comparative Literature. (3-0)** A comparative study of great literature in the world in translation. Topics may vary and may include examination of theme, technique, and type. May be repeated for credit when topics vary.
- 580-3 Studies in the Teaching of Composition. (3-0)** The course is devoted to the study of the aims, skills, materials, and practices of composition teaching at college and junior college levels. May be repeated for credit when topics vary.

- 585-v English Seminar. (Credit variable; 1-0 for each hour)** Content varies according to the needs and desires of the students. When topic varies, course may be taken for credit more than once. Open to students of graduate classification.
- 586-v Special Problems. (Credit variable)** Conference course. Directed independent study under supervision of a senior faculty member.
- 588-3 Thesis. (3-0)** Scheduled when student is ready to begin thesis. No credit until thesis is accepted. Prerequisites: 24 hours of graduate credit, including ENGL 598, and prior approval of department head.
- 597-3 Internship. (1-7)** Supervised professional activities in the college composition classroom including presentations, evaluation, and conferences. May be repeated once for credit. Field experience fee \$50.
- 598-3 Methods of Bibliography and Research Analysis. (3-0)** An introduction to methods of research and effective utilization of library resources. May include analytical bibliography, enumerative bibliography, and textual criticism.

## ENTOMOLOGY (ENTO)

- 201-3 General Entomology. (2-2)** Principal orders of insects; the relation of anatomy and physiology of insects to control methods; insecticides and their uses; development, habits, and economic importance of more common insects with control methods for the injurious species. Lab fee \$4.
- 301-3 Veterinary Entomology. (2-2)** Classification, biology, and control of arthropods associated with livestock and wildlife. Identification will be emphasized in the laboratory. Prerequisites: ANSC 107 or approval of instructor. Lab fee \$5.
- 401-4 Advanced Economic Entomology. (3-4)** Identification, biology, nature of damage, economic thresholds, and management of arthropods attacking crops and livestock. Pest management procedures involving natural, cultural, and biological suppression methods will be stressed. Prerequisite: ENTO 201 or approval of instructor.
- 405-3 Horticultural Entomology. (2-2)** Identification, nature of injury, life history, and control of common insects and related arthropods attacking turf grasses, landscape plants, shade, fruit, and nut trees, and greenhouse succulents. Management and control strategies utilizing chemical, cultural, and biological control agents. Prerequisites: ENTO 201 and HORT 200 or equivalents.
- 406-3 Integrated Pest Management. (3-0)** An introduction to the basic tenets of integrated pest management emphasizing the ecologically sound use of chemical, biological, cultural, and physical control tactics in managing pests. Credit for both ENTO 406 and 506 will not be awarded. Prerequisites: ENTO 201 and senior classification or approval of instructor of record.
- 416-3 Pesticides. (3-0)** A survey of chemical pesticides. Emphasis will be on the chemistry, mode of action, and safe use of insecticides, herbicides, and fungicides. Less common pesticides (rodenticides, piscicides, avicides, etc.) will also be reviewed. The use of chemical pesticides as a part of an integrated pest management program will be discussed. Credit for both ENTO 416 and ENTO 516 will not be awarded. Prerequisites: ENTO 201 and senior classification or approval of instructor of record.
- 484-6 Entomology Internship. (0-6)** A supervised, comprehensive working experience consisting of a minimum 240 hrs (6 weeks) at a departmentally-approved host location for career preparation in the public or private sector. Prerequisites: Junior or Senior classification; Approval of Department Head and academic advisor required prior to enrollment. Field Experience fee \$50
- 501-4 Advanced Economic Entomology. (3-4)** Identification, biology, nature of damage, economic thresholds, and management of arthropods attacking crops and livestock. Pest management procedures involving natural, cultural, and biological suppression methods will be stressed. Credit for both ENTO 401 and ENTO 501 will not be awarded. Prerequisite: ENTO 201 or approval of instructor.
- 506-3 Integrated Pest Management. (3-0)** An introduction to the basic tenets of integrated pest management emphasizing the ecologically sound use of chemical, biological, cultural, and physical control tactics in managing pests. Credit for both ENTO 406 and 506 will not be awarded. Prerequisites: graduate classification and approval of instructor of record.
- 516-3 Pesticides. (3-0)** A survey of chemical pesticides. Emphasis will be on the chemistry, mode of action, and safe use of insecticides, herbicides, and fungicides. Less common pesticides (rodenticides, piscicides, avicides, etc.) will also be reviewed. The use of chemical pesticides as a part of an integrated pest management program will be discussed. Credit for both ENTO 416 and ENTO 516 will not be awarded. Prerequisites: Graduate classification and approval of instructor of record.

## ENVIRONMENTAL ENGINEERING (ENVE)

- 210-3 Survey of Environmental Engineering. (3-0)** Survey of Environmental Engineering. (3-0) Introduction to environmental and occupational health, atmospheric systems and air pollution control, hazardous waste management, solid waste management, waste water management, and water supply treatment. Prerequisites: CHEM 108, and MATH 209 or concurrent enrollment. Course fee \$10.
- 211-4 Soil Mechanics. (3-3)** Introduction to the principles of soil and their influence on the hydrological cycle, Darcy's law and fluid flow through porous medium, stress distribution and consolidation of soil, subsurface exploration. Credit for both HYDR 211 and ENVE 211 will not be awarded. Prerequisites: MATH 120. Course fee \$15. Lab fee \$10.

- 300-4 Mechanics of Fluids. (3-3)** Principles of hydrostatics, dynamics of viscous and non-viscous fluids, resistance to flow in pipes and open channels, transport processes, energy equation, Bernoulli equation, conservation of mass, conservation of momentum. Credit for both HYDR 300 and ENVE 300 will not be awarded. Prerequisites: PHYS 122, MATH 333. Lab fee \$10. Course fee \$10.
- 301-4 Environmental Systems Modeling. (3-3)** Apply conceptual and numerical techniques to model environmental systems. Use differential equations to describe processes. Prerequisites: MATH 306, ENGR 112, 222, and ENVE 300. Lab fee \$15.
- 310-4 Basic Hydrology. (3-3)** Study of the hydrologic cycle, precipitation processes, soil moisture, infiltration, groundwater, rainfall-runoff processes, utilization of water resources, and frequency analysis; introduction to HEC-HMS programs for modeling hydrologic processes, elementary principles of field work. Credit for both HYDR 310 and ENVE 310 will not be awarded. Prerequisites: HYDR 110 or ENVE 210; GEOL 105, ENVE 211, 300, and MATH 333; MATH 300 or 350. Lab fee \$15.
- 320-4 Groundwater Hydrology. (3-3)** Topics include aquifer characteristics, infiltration, fluid dynamics of groundwater flow, potential flows, well analysis, water quality, groundwater pollution, legal issues in groundwater. Credit for both HYDR 320 and ENVE 320 will not be awarded. Prerequisites: HYDR 110 or ENVE 210; ENVE 211, 300, GEOL 105, CHEM 108, and MATH 209; MATH 300 or 350. Lab fee \$10.
- 402-4 Atmospheric Systems and Air Pollution Control. (3-3)** Study of atmospheric impact on air pollution. Study of sources of air pollution and their control to include gases and particulate matter. Study of air pollution regulations and air pollution modeling. Design of systems to control and abate air pollution. Study and design of sampling systems to monitor air pollution. Prerequisites: CHEM 108, ENGR 222, senior classification and approval of department head. Lab fee \$15.
- 410-3 Water Resources Engineering. (3-0)** Fundamentals of hydraulics applicable to open channel flow, natural streams and waterways; irrigation flow characteristics; hydrologic analysis; fluid measurement methods; introduction to hydraulic models including HEC-RAS; and economic aspects of water resources. Credit for both HYDR 410 and ENVE 410 will not be awarded. Prerequisites: HYDR 110 or ENVE 210; ENVE 300 and MATH 333.
- 420-4 Municipal and Industrial Water Supply and Waste Water Treatment. (3-3)** Treatment and distribution of residential and industrial water supplies, waste water treatment and disposal methods of municipal and industrial systems, environmental toxicology; aspects of groundwater monitoring and water quality maintenance. Laboratory analysis of water and waste water quality. Design of elementary treatment, distribution, and collection systems. Credit for both HYDR 420 and ENVE 420 will not be awarded. Prerequisites: HYDR 110 or ENVE 210; CHEM 201, ENVE 300 and MATH 333; MATH 300 or 350. Lab fee \$15. Course fee \$10.
- 430-3 Texas Water Resource Management. (3-0)** The ecological relation of water in this biosphere with special reference to the human role; the role of behavioral sciences (social, legal, economic, political, and psychological) in the development, conservation, regulation, and utilization of water resources; current political structure and laws pertaining to the administration of water resources in the state of Texas. Credit for both HYDR 430 and ENVE 430 will not be awarded. Prerequisites: ENVE 310 and POLS 202.
- 486-v Special Problems. (variable)** Directed study of selected topics in Environmental Engineering. May be repeated with approval of department head.

## ENVIRONMENTAL SCIENCE (ENVS)

- 500-3 The Regulatory Environment. (3-0)** A survey of local, state, national, and international regulatory agencies to include their organization and authority. Case studies of environmental problems and legislated regulations are covered.
- 510-3 Environmental Geology. (3-0)** Explores the physical controls geology imparts to the global ecosystem through systems analysis of geologic processes. Hydrologic processes, river system processes and restoration, energy resources, coastal systems, and karst systems are all potential topics explored. Credit for both ENVS 510 and GEOL 510 will not be awarded. Prerequisites: GEOL 105 or consent of department head.
- 528-3 Environmental Literacy. (3-0)** Scientific, social, business, and educational aspects of environmental topics, to include biodiversity, water quality, point and nonpoint source pollution control, carcinogens in the environment, industrial and agricultural chemicals, ozone hole and CFCs, global warming, deforestation, natural resource conservation, waste management, sustainable development, ecosystems, air quality, and green consumerism.
- 529-3 Applications of Geographic Information Systems in Environmental Science. (2-3)** Environmental and natural resource applications of Geographic Information Systems. Introduction to spatial analysis and 3-D analysis. The availability and uses of digital resources. Prerequisite: E S 220. Lab fee \$15. Course fee \$15.
- 561-3 Environmental Site Assessment. (3-0)** Introduction to Phase I and Phase II investigations, principles of siting and installation of monitoring wells, a review of sampling methods and sample design, and the use of water quality data to characterize subsurface contamination. Credit for both GEOL 561 and ENVS 561 will not be awarded. Prerequisites: GEOL 320 or consent of Department Head.

- 586-v Environmental Problems. (Credit variable.)** Independent research under the supervision of an instructor. A formal report will be submitted to the instructor. A student may not count more than 6 hours of Environmental Science problems toward a degree. Lab fee \$10.
- 588-3 Thesis (3-0)** Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisite: BIOL 598 and consent of major professor.
- 590-3 Topics in Environmental Science. (3-0)** Scientific aspects of varied environmental topics, which may include waste disposal, wetlands, air pollution, energy, bioremediation, or watershed analysis. May be repeated for credit as topics vary. Prerequisites: 12 hours of science (including six hours of chemistry) or approval of department head.