

collection systems. Credit for both HYDR 420 and ENVE 420 will not be awarded. Prerequisites: MATH 311 or concurrent registration, HYDR 300 and CHEM 201. Lab fee \$15. Course fee \$10.

- 430-3 Texas Water Resource Management. (3-0-WI)** 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: HYDR 310 and POLS 202.
- 440-1 Internship. (0-1)** Work experience with consulting firms, government agencies, and other practitioners. This course emphasizes students' practical experiences. Cannot be taken more than once for credit. Prerequisite: GEOL 105, HYDR 110. Field experiences fee \$75.
- 450-3 Modeling in Hydrology. (3-0)** Necessity of model studies. Introduction to various types of models; physics of surface and ground water flow; finite difference model; finite element model; solution of practical problems by numerical modeling. Prerequisites: MATH 333 or 360; HYDR 300, HYDR 320.
- 486-v Hydrology Problems. (Credit variable)** A directed study of selected problems in hydrology.
- 488-v Undergraduate Research Project. (Credit variable)** Preliminary research methods will be addressed through a faculty-directed project that integrates hydrology with the student's support area. Project components may include a literature review, data analysis, testing, planning, design, modeling, and computer programming. The student is required to prepare a final report and give a presentation. No credit is earned until the student has enrolled in at least 3 credit hours and the final report and presentation are certified as completed by the faculty member directing the project, at which time the student will receive 3 credit hours. Prerequisites: Junior Standing, HYDR 310, HYDR 320, and 9 or more advanced hours defining a support area.

INDUSTRIAL TECHNOLOGY (I T)

- 105-3 Principles of Drafting. (2-4)** An introduction to mechanical drafting involving geometrical constructions, orthographic projection, dimensioning techniques, sectional views, auxiliary views, isometric views, and other topics related to manufacturing and other areas of drafting. Lab fee \$10.
- 106-3 Power Transfer Technology. (2-4)** A study of power transfer mechanisms used in industrial machines including those used for obtaining mechanical advantage (gears, pulleys, inclined planes, and levers), pneumatics, and hydraulics. The theory of operation and practical applications are stressed. Lab fee \$10.
- 117-3 Metals Technology. (2-4)** A study of metals and their machining characteristics and application. Emphasis is placed on layout, precision measurement, and heat treating. Laboratory experiences include work with sheet metal, metal casting, and metal lathe operation. Lab fee \$10.
- 235-3 Solid Modeling. (2-4)** A study of complex three-dimensional solid models used in the fields of mechanical engineering, sheet metal, welding, and other areas of manufacturing and engineering. Orthographic views projected from solid models and annotation techniques are used to produce

engineering drawings. Prerequisite: I T 105 or 3 semester hours of drafting or approval of the instructor. Lab fee \$10.

- 303-3 Industrial Materials. (2-4)** A study of the structure, properties, processing, and application of metallic, polymeric, ceramic, and composite materials utilized in manufacturing. Laboratory exercises include processing methods, physical and mechanical testing, modification of properties, manufacturing applications, and material identification. Lab fee \$10.
- 314-3 Principles of Technology Education. (3-0)** A study of the Texas Technology Education curriculum, to include the areas of communication, manufacturing, construction, energy, power, transportation, computer applications, bio-related technology, electricity, electronics, graphics, principles of technology, and other related technologies.
- 317-3 Machine Tool Technology. (2-4)** Fundamentals and principles of metal removal processes. Emphasis is placed on metal lathes, milling machines, grinding machines, and electric discharge machines. Prerequisite: I T 117. Lab fee \$10.
- 318-3 Research and Reporting for Technologists. (3-0)** A study of research tools, methods, and data collection techniques used in the field of Engineering Technology. Emphasis will be placed on gathering, analyzing, and presenting technical information related to manufacturing topics in both oral and written form. Technical reports, product documentation, and correspondence will also be discussed. Prerequisites: ENGL 112 and junior status or approval of the department head.
- 320-3 Industrial Safety. (3-0)** A study of principles and practices used to establish a safe and healthful environment for industrial personnel. Includes a study of general industrial safety, safety and health regulation agencies, hazard recognition and correction, and first aid. Credit for both I T 320 and MGMT 320 will not be awarded.
- 324-3 Thermoplastic Processing. (2-4)** A study of thermoplastic materials and processes used in plastics manufacturing. Emphasis will be placed on injection molding, thermoforming, extrusion, rotational casting, expansion processes, hot melt casting, and coatings. Also the impact of material selection on processing parameters will be stressed. Lab fee \$10.
- 325-3 Thermoset Plastic Processing. (2-4)** A study of the processes, equipment, and molds that are used to produce thermoset products. Emphasis will be placed on pultrusion, compression molding, transfer molding, filament winding, and hand lay-up of glass reinforced composite materials. The properties of thermoset materials will also be studied. Lab fee \$10.
- 340-3 Ceramics and Jewelry. (2-4)** A study of the history, media, and processes used in the design and creation of jewelry, ceramics, and pottery. Other three-dimensional media may also be studied. Emphasis is on the historical significance of three-dimensional artifacts as an expression of cultural advancement. Principles and techniques of investment casting, sculpting in wax, slip casting, and other methods of creating three-dimensional art will be emphasized. Lab fee \$10.
- 345-3 Industrial Design. (2-4)** An application based course that exposes students to industrial design and provides experience in the varied aspects of the design process, culminating in a final, individual design project. Topics include, but are not limited to: Working drawings, tolerancing, dimensioning, material selection and pricing, sketching and proper design techniques. Prerequisite: I T 235 or approval of the instructor. Lab fee \$10.

- 350-3 Numerical Control Systems. (2-4)** Principles, techniques, and applications found in numerically controlled machine tool programs. The course will focus on the application of computer assisted machine programs to generate and verify tool paths. Laboratory experiences include generating, posting, simulating, and machining N/C part programs. Prerequisite: I T 117 or approval of the instructor. Lab fee \$10.
- 393-3 Modular Technology. (2-4)** This course will investigate various systems used in modular technology education. Modular technology studies will include broadcasting technology, applied physics, power energy, transportation, graphic communication, composites, and computer application. Prerequisite: junior standing. Lab fee \$15.
- 399-v Cooperative Education. (variable)** This course is designed to offer students the opportunity to integrate academic study with work experience that is germane to their major or minor. Enrollment requires a two-semester minimum commitment that may be accomplished by 1) alternating semesters of full-time study with semesters of curriculum-related employment, or 2) enrolling in courses at least half-time (6 semester hours) and working part-time in parallel positions of curriculum-related employment. The department Cooperative Education advisor will supervise the student's experience and assign the final grade based on the student's final report which is required to complete the course. Students may participate in the Cooperative Education program for an unlimited number of semesters but a maximum of 6 hours credit may be counted toward a degree. Prerequisites: Completion of 30 semester hours which includes 12 hours in the major or minor discipline in which the Cooperative Education course is desired, minimum overall GPA of 2.5 and a minimum GPA of 3.0 in the appropriate major or minor field, and department head approval. Field experiences fee \$50.
- 405-3 Architectural Drafting. (2-4)** A course in residential architectural drafting using computer-aided drafting. Emphasis is placed on residential design and home planning. Lab fee \$10.
- 450-3 Numerical Control Programming. (2-4)** A study of advanced machine control techniques used in manufacturing including; in-part fixturing, high speed machining, and table driven parts programs. The role and function of post processors for machine control will be explored. Lab experiences include designing fixtures, creating post processors and machining assemblies using N/C part programs. Prerequisite: I T 350. Lab fee \$10.
- 461-3 Computer Aided Visualization. (2-4)** The principles of computer aided visualization and simulation as they relate to mechanical design and assemblies. Software tools will be used to analyze parametric parts and assemblies for strength, function, range of motion and interference. Photorealistic animation and images will also be produced to simulate realistic lighting, texture, and colors. Prerequisite: IT 361 or approval of the instructor. Lab fee \$10.
- 484-6 Internship. (0-6)** An approved, supervised, comprehensive work experience consisting of a minimum of 240 hours (6 weeks) in an industrial or manufacturing enterprise. Prerequisites: Junior or senior classification and approval of academic advisor and department head. The internship may be repeated for a maximum of 6 hours of credit. Field experience fee \$75.
- 486-v Problems. (Credit variable)** This course is designed to meet the needs of Engineering Technology students who have above average academic ability and who need to pursue subject matter that is not normally included in the

Engineering Technology curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head. The student must be currently enrolled in one of the majors offered in the Engineering Technology Department. Prerequisite: completion of 30 or more hours in the Department of Engineering Technology.

495-3 Engineering Technology Projects. (2-4) A capstone projects course emphasizing a team approach to the analysis and solutions of manufacturing problems. Projects will be supplied by industry whenever possible. Emphasizes scheduling, design, working in teams, final written report and presentation. Restricted to Engineering Technology majors. Prerequisite: Senior standing. Lab fee \$15.

586-v Problems. (Credit variable) Open to students who are pursuing graduate work and have a background in Engineering Technology. Problem chosen by the student and developed through conferences and activities directed by the supervising professor. Prerequisite: Graduate classification and approval of department head.

LIBERAL STUDIES (L S)

498-3 Liberal Studies Capstone Course. (3-0) This course requires students to integrate and use fundamental concepts learned in previous courses within the students' degree concentrations including research and analysis of real-world phenomena and problems. Students will present written reports on their research, supplemented by appropriate internet and multimedia materials, as well as portfolios documenting their research. This is a writing intensive course for Liberal Studies majors. Prerequisites: CIS 103 or 300; ENGL 309; senior standing, approved degree plan for Bachelor of Science in Liberal Studies program.

MANAGEMENT (MGMT)

301-3 Principles of Management. (3-0) A study of the basic managerial functions of planning, organizing, staffing, directing, and controlling resources to accomplish organizational goals. The systems concept of management and role of the manager in each level of the organization are emphasized. Prerequisite: Junior classification or approval of department head.

302-3 Personnel/Human Resources Management. (3-0) Fundamental functions of human resources management; relationship between personnel management and organizations' emerging role of personnel administration in development of strategic policy for organizations. Prerequisite: MGMT 301.

303-3 Supervisory Management. (3-0) Investigates the role, function, and responsibilities of the supervisor in modern organizations through study of sociological and psychological theories in human relations. The primary emphasis is on development of supervisory skills in communications, motivation, discipline, morale, and grievances as they arise in superior-subordinate relationships. Prerequisite: MGMT 301 or approval of department head.

304-3 Small Business Management. (3-0) Oriented toward planning for and managing a small business, starting a business, and buying a business franchise. May include computer simulation and consultation for actual small business. Prerequisites: MGMT 301, ACC 204, MKTG 314 or department head approval.

320-3 Industrial Safety. (3-0) A study of principles and practices used to establish a safe and healthful environment for industrial personnel. Includes a study of