

ENGR - ENGINEERING (ENGR)

ENGR 101 Energy: Resources, Utilization and Importance to Society

Credits 4. 3 Lecture Hours. 2 Lab Hours. Introductory course about current and potential energy sources, the link between energy and wealth, and the consequences of action or inaction concerning energy and the environment.

ENGR 102 Engineering Lab I - Computation

Credits 2. 1 Lecture Hour. 3 Lab Hours. Introduction to the design and development of computer applications for engineers; computation to enhance problem solving abilities; basic concepts of software design through the implementation and debugging of student-written programs; introduction to engineering majors, career exploration, engineering practice within realistic constraints, e.g. economic, environmental, ethical, health and safety, and sustainability; pathways to success in engineering. **Prerequisite:** Grade of C or better in MATH 151 or MATH 150, or concurrent enrollment; admission to the college of engineering.

ENGR 112 Foundations of Engineering II

Credits 2. 1 Lecture Hour. 3 Lab Hours. Continuation of ENGR 111. Topics include, depending on the major, emphasis on computer applications and programming and solids modeling using CAD tools or other software; fundamentals of engineering science; advanced graphic skills. **Prerequisite:** ENGR 111; MATH 151 or concurrent enrollment; admission to the College of Engineering; also taught at Galveston campus.

ENGR 181 Engineering Honors Seminar I

Credit 1. 1 Lecture Hour. Co-curricular experiences related to academic success, undergraduate research and service in preparation for careers in research and technology leadership. **Prerequisites:** Admitted to engineering honors; freshman or sophomore classification.

ENGR 216/PHYS 216 Experimental Physics and Engineering Lab II - Mechanics

Credits 2. 1 Lecture Hour. 3 Lab Hours. Description and application of laws of physical motion to the solution of science and engineering problems; using sensing, control and actuation for experimental verification of physics concepts while solving engineering problems. **Prerequisites:** Grade of C or better in MATH 151 or MATH 171 or equivalent; grade of C or better in ENGR 102; grade of C or better and concurrent enrollment in PHYS 206; also taught at Galveston campus. **Cross Listing:** PHYS 216/ENGR 216.

ENGR 217/PHYS 217 Experimental Physics and Engineering Lab III - Electricity and Magnetism

Credits 2. 1 Lecture Hour. 3 Lab Hours. Electromagnetism and electromechanical systems; use of sensing, control and actuation to demonstrate key physical relationships through the transducer relationships linking pressure, temperature and other physical stimuli to changes in electric and magnetic fields. **Prerequisites:** Grade of C or better in MATH 152 or MATH 172, or equivalent; grade of C or better in PHYS 206 or equivalent; grade of C or better in PHYS 216/ENGR 216 or ENGR 216/PHYS 216; grade of C or better and concurrent enrollment in PHYS 207; also taught at Galveston campus. **Cross Listing:** PHYS 217/ENGR 217.

ENGR 251 Creating a Self-Aware Leader

Credits 3. 2 Lecture Hours. 2 Lab Hours. Fundamentals of engineering leadership and business; organizational dynamics; self-awareness. **Prerequisites:** Grade of C or better in ENGR 102, and ENGR 216/PHYS 216 or PHYS 216/ENGR 216; acceptance into the Zachry Leadership Program.

ENGR 270 Engineering Projects in Community Service

Credit 1. 1 Lecture Hour. Project course using team approach to engage students in open-ended community service projects involving non-profit agencies; includes project management, understanding the complete design process, awareness of the customer in engineering design, and the ability to communicate effectively. May be taken six times for credit. **Prerequisites:** ENGR 102 or approval of instructor; freshman or sophomore classification in an engineering major.

ENGR 281 Engineering Honors Mentoring and Team Building Seminar

Credits 0-1. 0-1 Other Hours. Selected topics related to peer mentoring and team building while participating in co-curricular activities; emphasis on building supportive relationships on campus; provides practical experience in being a member of a project involving campus or community-based engagement; for those serving as a Coach (i.e., student leader providing light mentoring to the residents) in the Engineering Honors Living Learning Community (Engineering Honors Community of Scholars or ECOS). **Prerequisites:** Appointment to be a Coach in ECOS; approval of instructor.

ENGR 285 Directed Studies

Credits 0 to 4. 0 to 4 Other Hours. Special problems in any area of engineering. **Prerequisites:** Freshman or sophomore classification; approval of department head.

ENGR 289 Special Topics in...

Credits 0 to 4. 0 to 4 Lecture Hours. 0 to 4 Lab Hours. Selected topics in an identified area of engineering. May be repeated for credit. **Prerequisite:** Approval of instructor.

ENGR 291 Research

Credits 0 to 4. 0 to 4 Other Hours. Research conducted under the direction of faculty member in the college of engineering. May be repeated three times for credit. **Prerequisites:** Freshman or sophomore classification and approval of instructor.

ENGR 301 College of Engineering Study Abroad

Credits 0 to 18. 0 to 18 Other Hours. For students in approved programs abroad. May be repeated for credit. **Prerequisites:** Admission to approved program; approval of study abroad coordinator.

ENGR 302

Credits 0.

ENGR 350 Leading for Impact in Engineering, Business and Society

Credits 3. 2 Lecture Hours. 2 Lab Hours. Fundamental leadership and business topics relevant to engineering and technical careers; business model development; business strategy; leadership theory; empathy.

Prerequisites: Grade of C or better in ENGR 251; acceptance into the Zachry Leadership Program; junior or senior classification or approval by instructor.

ENGR 351 The Role of Engineering and Business in Society

Credits 3. 2 Lecture Hours. 2 Lab Hours. Exploration of engineering and business contributions to society; political, cultural, societal and economic forces' impact on engineering; using creativity and imagination to solve engineering and societal challenges. **Prerequisites:** Acceptance into the Zachry Leadership Program; ENGR 350; junior or senior classification or approval by instructor.

ENGR 381 Engineering Honors Community of Scholars Leadership Seminar

Credits 0-1. 0-1 Other Hours. Selected topics related to leadership and management theory and practice in the context of co-curricular activities, involving multidisciplinary teams; provides practical experience in leading projects involving community-based engagement and residence-based programming; for those serving as Fellows, student leaders in the Engineering Honors Living Learning Community (Engineering Honors Community of Scholars or ECOS). **Prerequisite:** Appointment to be a Fellow in ECOS; approval of instructor.

ENGR 385 Problems for Co-Op Students

Credits 1 to 3. 1 to 3 Other Hours. Special problems in engineering for cooperative education students; problems related to student's work assignment culminating in a research paper; three hours may be used as technical elective, and one additional hour may be used as free elective; a total of 4 hours may be used toward graduation. **Prerequisite:** Approval of department head.

ENGR 399 Engineering Honors Community of Scholars - Engineering Honors Residential Community

Credits 0. 0 Other Hours. Participation in an approved high-impact learning practice within the Engineering Honors (EH) program which includes the EH Living Learning Community (ECOS); reflection on professional outcomes; documentation and self-assessment of learning experience.

ENGR 401 Interdisciplinary Design

Credits 3. 2 Lecture Hours. 3 Lab Hours. Instruction and practice in the design process applied to an interdisciplinary design project including establish the customer need; determine requirements in terms of function (what) and performance (how well); develop alternative design concepts; perform trade-off studies among performance, cost and schedule; embodiment and detail design; iterate the above steps; major interdisciplinary design project. **Prerequisites:** Senior classification and approval of instructor.

ENGR 402 Interdisciplinary Design II

Credits 3. 2 Lecture Hours. 3 Lab Hours. Product detail and design development process including case studies; may include project management, marketing considerations, manufacturing detailed design specifications; failure modes, applications of codes and standards, selection of design margins; product (component) development guidelines; intellectual property, product liability and ethical responsibility. **Prerequisites:** ENGR 401; junior or senior classification.

ENGR 410 Global Engineering Design

Credits 3. 3 Lecture Hours. Intercultural models and their application to engineering design in diverse, multinational and multidisciplinary settings; engineering design project working in international teams of students, faculty and industry experts; applying engineering skills to the project; includes the study and application of intercultural models, global enterprise fundamentals and remote collaboration technologies; required for the International Engineering Certificate. **Prerequisite:** Junior or senior classification or approval of instructor.

ENGR 450 Finding Your Leadership Qualities

Credits 3. 2 Lecture Hours. 2 Lab Hours. Exploration of personal leadership qualities and perspective; case studies in leadership in engineering enterprises; business etiquette and personal marketing. **Prerequisites:** Grade of C or better in ENGR 351; acceptance into the Zachry Leadership Program; junior or senior classification or approval by instructor.

ENGR 451 Leading for a Lifetime: Continual Learning and Influence

Credits 3. 2 Lecture Hours. 2 Lab Hours. Intersection of engineering, business, citizenship and leadership. **Prerequisites:** Grade of C or better in ENGR 450; acceptance into the Zachry Leadership Program; junior or senior classification or approval by instructor.

ENGR 462 Engineering Entrepreneurship Hour

Credit 1. 1 Lecture Hour. Designed to engage with successful technology entrepreneurs from across the nation; learn about the characteristics of successful entrepreneurs and their strategies in launching and sustaining businesses on technology innovation; network with highly successful entrepreneurs and develop relations valuable to professional careers. **Prerequisites:** Junior or senior classification or approval of instructor.

ENGR 484 International Engineering Internship

Credits 0 to 6. 0 to 6 Other Hours. International Engineering Internship. May be taken for credit up to six hours. **Prerequisite:** Junior or senior classification.

ENGR 485 Directed Studies

Credits 0 to 4. 0 to 4 Other Hours. Directed individual study of problems in any area of engineering. May be taken 3 times for credit. **Prerequisites:** Junior or senior classification; approval of the college.

ENGR 489 Special Topics in...

Credits 0 to 4. 0 to 4 Lecture Hours. 0 to 6 Lab Hours. Selected topics in an identified field of engineering. May be repeated for credit.

ENGR 491 Research

Credits 0 to 4. 0 to 4 Other Hours. Research conducted under the direction of faculty member in the College of Engineering. May be repeated 3 times for credit. Registration in multiple sections of this course is possible within a given semester provided that the per semester credit hour limit is not exceeded. **Prerequisites:** Junior or senior classification and approval of instructor.

ENGR 499 Grand Challenge Scholars Program

Credits 0. 0 Other Hours. Participation in an approved high-impact learning practice within the Grand Challenge Scholars program (GCSP); reflection on professional outcomes; documentation and self-assessment of learning experience.