

# ENGINEERING (ENGR)

## Engineering Undergraduate Courses

### ENGR 10 FRESHMAN ENGINEERING SEMINAR (0 credits)

Overview of the engineering field as well as major specific information. Information will be provided to help with transitional needs to UNL and the college of engineering (time management, study skills, and resources), involvement opportunities (student organizations, research, and study abroad, tours of engineering facilities for experiential learning, and interactive learning to increase business knowledge and skills.

**Prerequisite(s):** First year College of Engineering students. Not open to non-degree graduate students.

### ENGR 15 SPATIAL VISUALIZATION TRAINING (0 credits)

Develop and improve spatial visualization skills.

### ENGR 20 SOPHOMORE ENGINEERING SEMINAR (0 credits)

Overview of career opportunities in engineering and construction management. Emphasizes internships, cooperative education and career placement.

**Prerequisite(s):** Not open to non-degree graduate students.

### ENGR 30 TRANSFER STUDENT ENGINEERING SEMINAR (0 credits)

ENGR 30 is open only to students transferring to the College of Engineering from another institution. Overview of transfer credit analysis, degree audits, career opportunities in engineering and construction management. Emphasis on internships, cooperative education, and career placement.

**Prerequisite(s):** Not open to non-degree graduate students.

### ENGR 100 INTERPERSONAL SKILLS FOR ENGINEERING LEADERS (3 credits)

Establishes a foundation in communication and leadership skills that is needed for engineering students to be successful in their academic endeavors and future career opportunities. Introduction to the principles and practices of positive interpersonal relationships for leadership development. Self-awareness, awareness of others, effective interpersonal communication, and the building of trust relationships as a basis for understanding and developing leadership.

**Prerequisite(s):** Not open to non-degree graduate students.

### ENGR 101 INTRODUCTION TO ENGINEERING (3 credits)

Students will examine relevant and practical industrial and commercial engineering applications to gain necessary engineering skills that will help them succeed as a student as well as a professional engineer. A variety of engineering disciplines will be highlighted and discussed, as well as topics in the underlying physical, chemical, and biological scientific principles and processes related to each topic. The class will use a specified focus area that involves real world applications to aid in the conceptualization and learning of the course material. Students will develop engineering problem solving skills; gain expertise and experience using modern engineering and computational tools; and emulate an engineering team atmosphere - each of which can be applied to a profession engineering environment.

### ENGR 191 FRESHMAN ENGINEERING SPECIAL TOPICS (1-3 credits)

Topics vary.

### ENGR 200 PROFESSIONALISM & GLOBAL PERSPECTIVE (3 credits)

Enhance essential professional skills for personal and team success through investigating issues in a global context. Explore in-demand professional aptitudes (self-awareness, emotional intelligence, teamwork, communication, and workplace interaction expectations). Through industry/community interaction, explore cultural and business norms and the application of broader perspectives to identify issues/solutions responsive and adaptive to their global context.

### ENGR 250 ENGINEERING COOPERATIVE EDUCATION (1-12 credits)

Cooperative education work in a regularly established cooperative education work-study program in any engineering curriculum. Special approval is required to take course for credit hours. C/N only.

**Prerequisite(s):** Sophomore standing; permission of College of Engineering Dean's Office and department chair of student's engineering major. All engineering students participating in cooperative education must register each term prior to commencing work.

### ENGR 291 SOPHOMORE ENGINEERING SPECIAL TOPICS (1-3 credits)

Topics vary.

### ENGR 300 CREATIVITY AND WRITING FOR ENGINEERS (3 credits)

Writing technical engineering reports; creative thinking and brainstorming applied to a real engineering problem with individual solutions submitted in report form.

**Prerequisite(s):** ENGL 1160 and Sophomore

### ENGR 301 INTRODUCTION TO NUCLEAR AND RADIATION ENGINEERING CONCEPTS (1 credit)

History of nuclear development, basic concepts of radiation and radioactivity, radioactive waste management, global warming, and the impact of nuclear power plants. Industrial applications, health, and nuclear medicine. Job opportunities at power plants, graduate school, and national laboratories. Tour of the University of Texas nuclear research reactor and demonstration experiments. (Requires off-campus travel.)

**Prerequisite(s):** Not open to nondegree students

### ENGR 310 UTILIZATION OF NUCLEAR TECHNOLOGIES IN SOCIETY (3 credits)

The applications of nuclear science to society and the fundamental radiation principles utilized in these applications.

**Prerequisite(s):** Not open to non-degree graduate students.

### ENGR 320 LEADERSHIP, MANAGEMENT, AND ETHICS (3 credits)

Explore professional leadership, ethics, project management tools and skills, and how to successfully implement and respond to change. In a team based environment, enhance essential professional skills for personal and team success by developing and presenting a responsive proposal considering: client needs, basic project controls and scheduling. Learn about personal styles, motivation and effectively implementing change. Examine ethical dilemmas regarding principles, stewardship, and civics from ethical, legal, and expediency perspectives.

**Prerequisite(s):** Not open to non-degree graduate students.

### ENGR 350 ENGINEERING COOPERATIVE EDUCATION (0-12 credits)

Cooperative education work in a regularly established cooperative education work-study program in any engineering curriculum. Special approval is required to take course for credit hours. C/N only.

**Prerequisite(s):** Junior standing; permission of College of Engineering Dean's Office and department chair of student's engineering major. All engineering students participating in cooperative education must register each term prior to commencing work.

### ENGR 391 JUNIOR ENGINEERING SPECIAL TOPICS (1-3 credits)

Topics vary

### ENGR 395 ENGINEERING INTERNSHIP (0-1 credits)

Provides an opportunity to reflect on experience gained through an internship related to the major field of study and an integral or important part of their program of study. Develop non-technical professional skills through reflective writing assignments. May be repeated.

**Prerequisite(s):** Undergraduate major in the College of Engineering; sophomore standing; permission from instructor.

### ENGR 400 PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY (1 credit)

Discussions on professionalism and ethics of engineering practice; problems encountered by new graduates.

**Prerequisite(s):** Senior

**ENGR 402 ENERGY SYSTEMS AND RESOURCES (3 credits)**

Energy as a critical component of civilization. The critical role of energy from the economic and political point of view world wide. Energy resources available, the technology to use the resources, the economics of energy production, the environmental consequences of energy use, and energy policy.

**Prerequisite(s):** ENGR 301, not open to nondegree students

**ENGR 410 RADIATION PROTECTION AND SHIELDING (3 credits)**

Basic principles and concepts of radiation protection and shield design. Dosi-metric units and response functions, hazards of radiation doses, radiation sources, basic methods for dose evaluation, and shielding design techniques for photons and neutrons.

**Prerequisite(s):** MECH 4010 or ENGR 421

**ENGR 411 NUCLEAR REACTOR THEORY (3 credits)**

Introduction to neutron diffusion theory, neutron moderation, neutron thermalization, and criticality condition of nuclear reactor.

**Prerequisite(s):** ENGR 310. Not open to non-degree graduate students.

**ENGR 412 NUCLEAR REACTOR ANALYSIS (3 credits)**

Group diffusion method, multiregional reactors, heterogeneous reactors, reactor kinetics, and change in reactivity.

**Prerequisite(s):** ENGR 411. Not open to non-degree graduate students.

**ENGR 420 NUCLEAR REACTOR ENGINEERING (3 credits)**

The physics governing nuclear reactors and the design principles for commercial nuclear power plants. Reactor designs currently operating in the power industry.

**ENGR 450 ENGINEERING COOPERATIVE EDUCATION (0-12 credits)**

Cooperative education work in a regularly established cooperative education work-study program in any engineering curriculum. Special approval is required to take course for credit hours. C/N only.

**Prerequisite(s):** Senior standing; permission of College of Engineering Dean's Office and department chair of student's engineering major. All engineering students participating in cooperative education must register each term prior to commencing work.

**ENGR 460 PACKAGING ENGINEERING (3 credits)**

Investigation of packaging processes, materials, equipment and design. Container design, material handling, storage, packing and environmental regulations, and material selection.

**Prerequisite(s):** CONE 206; MECH 3210; MECH 3730

**ENGR 461 RFID SYSTEMS IN THE SUPPLY CHAIN (3 credits)**

Foundations of Radio Frequency Identification Systems (RFID). The fundamentals of how RFID components of tag, transponder, and antennae are utilized to create RFID systems. Best practices for implementation of RFID systems in common supply operations.

**ENGR 469 TECHNOLOGY, SCIENCE AND CIVILIZATION (3 credits)**

(Lect 2 Dis. 2) This course studies the development of technology as a trigger of change upon humankind, from the earliest tools of Homo Habilis to the advent of the radio telescope in exploring the creation of the universe. The course traces the paths from early science to development of the sciences and technologies that will dominate the new millennium. (869 is for non SET students.) (Cross-listed with ENGR 869).

**Prerequisite(s):** Senior or permission.

**ENGR 481 SUPPLY CHAIN OPTIMIZATION (3 credits)**

Foundations of supply chain network modeling. The concepts that support the economic and service trade-offs in supply chain and logistics management. Using decision support system (DSS) to design optimal logistics network models given data requirements and operational parameters. Using leading software packages to model problems arising in strategic management of logistics networks.

**ENGR 483 LOGISTICS IN THE SUPPLY CHAIN (3 credits)**

The process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption. Domestic transportation systems, distribution centers and warehousing, international logistics, logistic system controls, and reengineering logistics systems.

**ENGR 490 GLOBAL EXPERIENCES IN ENGINEERING (1-3 credits)**

Individual or group educational experience combining classroom lectures, discussions, and/or seminars with field and/or classroom studies in a foreign country. Choice of subject matter and coordination of on- and off-campus activities are at the discretion of the instructor.

**ENGR 491 SENIOR ENGINEERING SPECIAL TOPICS (1-3 credits)**

Topics vary.

**ENGR 4070 PROJECT MANAGEMENT (3 credits)**

Project development, role of the project manager, project selection, project planning, budgeting and cost estimation, project scheduling, and project termination.