



ENGINEERING (ENGR)

ENGR 10 Freshman Engineering Seminar

Description: 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), learning about engineering, and interactive learning to increase non-technical complete engineer competencies. Open only to first-year students considering or admitted to the College of Engineering.

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Grading Option: Pass No Pass

Offered: FALL

ENGR 20 Sophomore Engineering Seminar

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

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Grading Option: Pass No Pass

ENGR 100 Interpersonal Skills for Engineering Leaders

Prerequisites: Credit toward the degree may be earned in only one of: ALEC 102, ENGR 100, or ENGR 100H

Description: 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.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

Prerequisite for: CSCE 488

ACE: ACE 2 Communication Competence

Experiential Learning: Community Engagement

ENGR 100H Honors: Interpersonal Skills for Engineering Leaders

Prerequisites: Credit toward the degree may be earned in only one of: ALEC 102, ENGR 100, or ENGR 100H

Notes: Covers same topics as ENGR 100 but in greater depth. Students in Honors lab section will be expected to complete this work through presentations, writing assignments, and specific Service Learning Project.

Description: 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.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

ACE: ACE 2 Communication Competence

ENGR 101 Introduction to Engineering

Description: 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 professional engineering environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 102 PKF Engineering Academy Seminar I

Prerequisites: Must be a PKF Engineering Academy Scholar

Description: Introduction to resources that support academic, personal, financial, and professional growth. Focuses on success strategies and transitioning from high school to college, as well as building a community within the PKF Engineering Academy.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No Pass

Offered: FALL

Prerequisite for: ENGR 103

ENGR 103 PKF Engineering Academy Seminar II

Prerequisites: Must be a PKF Engineering Academy Scholar; ENGR 102

Description: Experience the Complete Engineer competencies by engaging in a semester-long service-learning project focused on the advancement and allyship of women in engineering, computing, and construction.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No Pass

Offered: SPRING

ENGR 191 Freshman Engineering Special Topics**Description:** Topics vary.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**ENGR 193 Kiewit Scholars Freshman Seminar****Prerequisites:** Must be a Kiewit Scholar.**Description:** Introduction to The Complete Engineer competencies with an emphasis on leadership and communication. Establishes what it means to be a Complete Engineer and demonstrates and develops the competencies, including industry mentorship from Kiewit. Skills will include greater self-awareness, understanding the complexities of leadership in today's world, and understanding the dynamics of interpersonal communication.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 2**Grading Option:** Pass No Pass**Offered:** FALL/SPR**ENGR 200 Professionalism and Global Perspective****Description:** 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**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** ENGR 320**ACE:** ACE 9 Global/Diversity ACE 6 Social Science**ENGR 220 Technical Communication I****Crosslisted with:** JGEN 200**Description:** Introduction to written and oral communication and document design principles and strategies as applied in the sciences and technology. Communications for various audiences and/or purposes and/or situations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** ECEN 481; ECEN 483; MECH 380**ACE:** ACE 1 Writing**ENGR 291 Sophomore Engineering Special Topics****Description:** Topics vary.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**ENGR 300 Principles of Nuclear Engineering****Description:** Introduction to nuclear engineering principles.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded with Option**Prerequisite for:** MECH 421, MECH 821, ENGR 421**ENGR 302 Introduction to Nuclear and Radiation Engineering Concepts****Description:** 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 physics, 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.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded**Prerequisite for:** ENGR 402; MECH 421, MECH 821, ENGR 421**ENGR 310 Utilization of Nuclear Technologies in Society****Description:** The applications of nuclear science to society and the fundamental radiation principles utilized in these applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**Prerequisite for:** ENGR 411; MECH 421, MECH 821, ENGR 421**ENGR 320 Leadership, Management and Ethics****Prerequisites:** ENGR 200**Description:** 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.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**ACE:** ACE 6 Social Science ACE 8 Civic/Ethics/Stewardship**ENGR 350 Engineering Cooperative Education****Prerequisites:** Junior standing; permission of College of Engineering Dean's Office and department chair of student's engineering major.**Notes:** All students in engineering participating in cooperative education must register each term prior to commencing work. P/N only. Special approval is required to take course for credit.**Description:** Cooperative education work in a regularly established cooperative education work-study program in any engineering curriculum.**Credit Hours:** 0-12**Min credits per semester:****Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Pass No Pass

ENGR 391 Junior Engineering Special Topics

Description: Topics vary.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 395 Engineering Internship

Prerequisites: Undergraduate major in the College of Engineering; sophomore standing; permission from instructor.

Description: 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.

Credit Hours: 0-1

Min credits per semester:

Max credits per semester: 1

Max credits per degree: 3

Grading Option: Pass No Pass

Offered: FALL/SPR

Experiential Learning: Internship/Co-op

ENGR 400 Professional Ethics and Social Responsibilities

Prerequisites: Junior standing

Description: Professional relations, personal requirements, civic responsibilities, and ethical obligations for engineering practice.

Legal registration of engineers and architects. Subprofessional and professional services. Changing conditions in engineering practice. Requirements for placement in engineering.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No Pass

Offered: FALL/SPR

ENGR 402 Energy Systems and Resources

Prerequisites: ENGR 301.

Description: 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.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 410 Radiation Protection and Shielding

Prerequisites: MATH 221 and ENGR 421.

Description: 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.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 411 Nuclear Reactor Theory

Prerequisites: ENGR 310.

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

Prerequisite for: ENGR 412

ENGR 412 Nuclear Reactor Analysis

Prerequisites: ENGR 411.

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 420 Nuclear Reactor Engineering

Prerequisites: MECH 421/821/ENGR 421.

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 421 Elements of Nuclear Engineering

Crosslisted with: MECH 421, MECH 821

Prerequisites: ENGR 300 or ENGR 301 or ENGR 310; MATH 208/MATH 208H; and PHYS 212/PHYS 212H

Description: Survey of nuclear engineering concepts and applications. Nuclear reactions, radioactivity, radiation interaction with matter, reactor physics, risk and dose assessment, applications in medicine, industry, agriculture, and research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: ENGR 410; ENGR 420

ENGR 447 Multi-disciplinary Engineering Capstone

Prerequisites: Senior standing, professional admission to an engineering program, and instructor permission.

Description: Definition, scope, analysis, synthesis, and the design for the solution of a comprehensive engineering problem in any major area of engineering, with emphasis on multi-disciplinary engineering problems.

Credit Hours: 2-6

Min credits per semester: 2

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Graded

Experiential Learning: Student Teaching/Education Practicum

ENGR 469 Technology, Science and Civilization

Prerequisites: Senior standing

Description: Study of 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. Tracing paths from early science to development of the sciences and technologies that dominate the new millennium.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ACE: ACE 8 Civic/Ethics/Stewardship

ENGR 490 Global Experiences

Prerequisites: Permission.

Notes: Choice of subject matter and coordination of on- and off-campus activities are at the discretion of the instructor.

Description: Individual or group educational experience combining classroom lectures, discussions, and/or seminars with field and/or classroom studies in a foreign country.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Graded

Experiential Learning: Education Abroad

ENGR 491 Senior Engineering Special Topics

Description: Topics vary.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

ENGR 493 Kiewit Scholars Advanced Seminar

Prerequisites: Students must be in good standing in the Kiewit Scholar program.

Description: Focuses on developing and fostering community, gaining exposure to industry leaders and mentors, and enhancing self-awareness and leadership skills.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 6

Grading Option: Pass No Pass

Offered: FALL/SPR