

ENGINEERING (ENGR)

ENGR 801 Engineering Education Research Graduate Seminar I

Description: Explore EER career paths; identify necessary knowledge, skills, and abilities; and plan an aligned graduate experience. Become familiar with the professional norms and ethical principles and practices related to research. Build one's academic community networks (e.g., DBER, engineering discipline). Develop oral communication skills appropriate for EER. Develop reflexive ability to make meaning of graduate experiences.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: FALL/SPR

Prerequisite for: ENGR 802

ENGR 802 Engineering Education Research Graduate Seminar II

Prerequisites: ENGR 801

Description: Develop foundational skills as an engineering education researcher including academic writing, poster presentations, engineering education funding. Build one's academic community networks (e.g., DBER, engineering discipline). Plan for the EER qualifying exam.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: FALL/SPR

ENGR 810 Ergonomics

Notes: Not open to students with credit in IMSE 315.

Description: Introduction to the principles of ergonomics. Information processing, human output and control, workplace design and environmental conditions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

ENGR 812 Occupational Safety-A Systems Analysis

Prerequisites: MECH 321

Description: Analysis of safety performance, attribution of cost, identification and analysis of accident potential. Fault Tree analysis. Systems safety and reliability.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 815 Cognitive Ergonomics

Prerequisites: ENGR 830 or permission

Description: Human factors affecting work. Focus on humans: energy requirements, lighting, noise, monotony and fatigue, learning, simultaneous versus sequential tasks. Experimental evaluation of concepts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: ENGR 919

Course and Laboratory Fee: \$15

ENGR 816 Physical Ergonomics

Prerequisites: ENGR 830 or permission

Description: Human performance in work. Human response to various environmental and task-related variables with emphasis on physical and physiological effects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: ENGR 919

Course and Laboratory Fee: \$15

ENGR 817 Occupational Safety Hygiene Engineering

Prerequisites: Senior standing.

Description: Introduction to occupational hygiene engineering with emphasis on workplace environmental quality. Heat, illumination, noise, and ventilation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 823 Reliability Engineering

Description: System and component reliability analyses of series, parallel and complex systems. Concepts of reliability, availability, and maintainability in design of systems. Methods of reliability testing and estimation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 824 Unique Concerns of Engineering Education

Description: The purposes and contexts of engineering education will be illuminated through readings and discussions of its historical roots, current expressions, and future directions. Discussions will delve into the history and trajectory of engineering education and concerns that are uniquely engineering (e.g., engineering design, diversity and inclusion, and teaming).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

ENGR 830 Applied Statistics and Quality Control

Prerequisites: MECH 321

Description: Systematic analysis of processes through the use of statistical analysis, methods, and procedures; statistical process control, sampling, regression, ANOVA, quality control, and design of experiments. Use of software for performing a statistical analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: ENGR 815; ENGR 816

ENGR 831 Stochastic Processes

Description: Fundamentals of stochastic processes and their application in modeling production/inventory control, maintenance and manufacturing systems. Markov and semi-Markov chains, Poisson processes, renewal processes, regenerative processes and Markov decision processes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 832 Scheduling

Description: The problem of scheduling several tasks over time, including measure of performance, single-machine sequencing, flow shop scheduling, the job shop problem and priority dispatching.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 833 Evidence-Based STEM Teaching Strategies

Description: This learning experience is designed to provide graduate level training on teaching at the postsecondary level. Evidence-based teaching methods applicable to Science, Technology, Engineering, and Mathematics (STEM) will be investigated and a learner-based pedagogy will be used to engage those in the course to experience STEM practices. The common element of problem solving is emphasized across all STEM disciplines allowing for discovery, exploration, and application of critical thinking skills. Primary tasks include developing a unit on Canvas that includes learning outcomes, lecture and activities, and assessments, a teaching philosophy, and engaging with technologies that support and enhance teaching and learning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

ENGR 834 Framing STEM Education Research

Description: Introduction to the basic types of research study designs (quantitative, qualitative, and mixed methods) through examples in STEM education. Learn to identify an educational problem in STEM education, pose a research question, and support the need for a study through literature review. Become familiar with how theories of learning and thinking are used to predict or explain research findings. Become familiar with the protection of human subjects and gain certification for human subjects research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

ENGR 840 Discrete Event Simulation Modeling

Prerequisites: CONE/BSEN 206 and MECH 321; CSCE 155A, CSCE 155E, CSCE 155H, CSCE 155N or CSCE 155T.

Description: Development of simulation models of discrete systems. Model development, Monte Carlo techniques, random number generators, and output analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Course and Laboratory Fee: \$15

ENGR 844 Theory in STEM Education Research

Description: Introduction to theories relevant to STEM education research. Differentiate and connect the roles of theoretical and conceptual frameworks in STEM education research. Become familiar with how to read, discuss, synthesize, critique, communicate, and apply theory in the context of a STEM education research study.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

ENGR 860 Packaging Engineering

Prerequisites: CONE/BSEN 206, MECH 321, MECH 373.

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 861 Radio Frequency Identification

Description: Fundamentals of how radio frequency identification (RFID) components of tag, transponder, and antennae are utilized to create RFID systems. Best practices for implementation of RFID systems in common supply chain operations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 869 Technology, Science and Civilization

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

ENGR 881 Supply Chain Optimization

Description: Concepts of the economic and service trade-offs in supply chain and logistics management. Using decision support system (DSS) to design optimal logistics network model with given requirements and operational parameters using leading software packages to model problems arising in strategic management of logistics networks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 882 Material Planning in Logistic Systems

Prerequisites: MECH 321 and IMSE 328.

Description: Theory, practice and application of inventory, demand and supply planning techniques in multistage environments. Managing economies of scale, uncertainties, capacity constraints, and product availability in a supply chain. Integrated planning, supply chain coordination and technology enablers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 883 Logistics in the Supply Chain

Description: 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, logistics system controls, and reengineering logistics systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 891 Special Topics in Engineering

Description: Subject matter in emerging areas of engineering and closely related areas which are not covered in other courses in the College of Engineering graduate programs. Topics, activities, and delivery methods vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

ENGR 895 Engineering Graduate Internship

Description: Apply theory learned in the classroom and experience hands-on applications through employment in industry. Gain practical application experience of engineering disciplines.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 3

Grading Option: Pass No-Pass

Offered: SUMMER

ENGR 898 Independent Research in Engineering

Prerequisites: Permission

Description: Independent research work and written findings, other than thesis or dissertation work, in a selected area of engineering under the supervision and guidance of a College of Engineering faculty member.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

ENGR 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Description: Masters Thesis

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Grading Option: Grade Pass/No Pass Option

ENGR 906 Financial Engineering

Prerequisites: IMSE 806.

Description: Applications of principle and financial economics in industrial and systems engineering. Term structure of interest, capital asset pricing and other capital allocation models. Evaluation of real-options using binomial lattice, Black-Scholes and other pricing models.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 919 Determinants of Occupational Performance

Prerequisites: ENGR 815, 816 or permission

Description: Focus on the individual in the industrial working environment. Emphasis on evaluation of fatigue, training, shift work, perception, vigilance, and work-rest scheduling as they relate to the working environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ENGR 998 Advanced Independent Research in Engineering

Prerequisites: Admission to master's degree program and permission of major adviser

Description: Advanced independent research work and written findings, other than thesis or dissertation work, in a selected area of engineering under the supervision and guidance of a College of Engineering faculty member.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

ENGR 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Description: Doctoral Dissertation

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Grading Option: Grade Pass/No Pass Option