ENGINEERING (ENGR)

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
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
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 theories relevant to STEM education research. Differentiate and connect the roles of theoretical and conceptual frameworks in STEM education research. Become familiar with theories of learning and thinking are used to predict or explain research findings. 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: FALL

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 845 Logistic 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 846 Technology, Science and Civilization
Description: Development of technology as a trigger of change upon humankind, from the earliest tools of Homo Habilus 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 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 862 Material Planning in Logistic Systems
Prerequisites: MECH 321 and IMSE 328.
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 863 Technology, Science and Civilization
Description: Development of technology as a trigger of change upon humankind, from the earliest tools of Homo Habilus 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 864 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 865 Logistic 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