

# INDUSTRIAL & SYSTEMS ENGINEERING

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## Courses

### ISE 300. Probability & Statistics for Engineers. 3 Hours

Conceptual and hands-on development of probability and statistics with software exercises. Probability problems, random variables, moments, distributions, data description and analysis, estimation (bootstrap), hypothesis testing, regression, analysis of variance, and non-parametrics. Prerequisite(s): MTH 218.

### ISE 346. Six Sigma Yellow Belt. 1.5 Hour

Six Sigma Yellow Belt.

### ISE 404. Engineering Concepts for Non-Engineers. 3 Hours

This is an introductory course in the mathematics, methods, and models used in engineering. As such, it provides the non-engineering student with a foundation to successfully complete graduate engineering courses required in the study of Human Factors Engineering (HFE). This is a prerequisite course for non-engineers pursuing the graduate certificate in human factors engineering and lacking the necessary skills in mathematics and statistics.

### ISE 408. Lean Management and Six Sigma. 3 Hours

This course aims to teach the tools and concepts used to improve business performance using the rigorous approach known as DMAIC. The course material covers a wide variety of analytical problem-solving strategies based on statistics and optimization. The course content also includes Lean Enterprise principles, such as poka-yoke, SMED, and pull-push systems. After successfully finishing this course, students will be equipped to help organizations achieve their operational excellence. Prerequisite(s): Junior or senior status.

### ISE 411. Problem Solving & Decision Making. 3 Hours

Study of the fundamentals of problems solving and decision making in strategic management. Provides a structured approach to solving problem in a business environment. Learn how to identify the problem, determine the causes of the problem, and develop an action plan to solve the problem. Apply the methods through case studies and team exercises.

### ISE 415. Global Supply Chain Management. 3 Hours

This course is intended to educate students on the fundamental roles played by supply chain management in the Global economy. Students will gain knowledge on the management of local and global supply chain functions and their impact on industries, customers, and suppliers. Students will learn to optimize supply chain resources to reduce cost and improve revenue. Students will learn to utilize data and contemporary tools to make informed decisions in a global supply chain environment.

### ISE 417. Legal Aspects of Engineering. 3 Hours

Legal principles applied to engineering. Special emphasis is given to the area of Contract Law due to the important and pervasive interaction that it has with engineering project work. Legal Method and the court system are introduced. Product liability and business relationships are discussed.

### ISE 421. Introduction to Operations Research. 3 Hours

Introductory courses cover deterministic methods for optimization, with a focus on mathematical programming (linear, nonlinear, and integer programming) and network methods. Prerequisite(s): CPS 132; (ISE 300 or MTH 367).

### ISE 422. Topics in Operations Research. 3 Hours

This is an introductory course covering probabilistic methods for modeling and analyzing the performance of complex systems. Topics include Markov chains, queuing, forecasting, discrete event simulation, and inventory modeling. Prerequisite(s): CPS 132; ISE 300 or MTH 367.

### ISE 430. Engineering Economy. 1-3 Hours

Introduction to the models and methods of engineering economic decision analysis. Fundamental economic concepts, cost estimates, time value of money, comparison of alternatives, before- and after-tax analysis, decision making under risk and uncertainty, break-even analysis, and linear programming models. Prerequisite(s): MTH 218.

### ISE 435. Human Factors. 3 Hours

Methods to improve the interface between the human and their environment. Human characteristics are studied to determine the best way to design the task, product, work station, or other environmental features to accommodate the human. Prerequisite(s): (Junior or senior status) or permission of instructor.

### ISE 438. Sustainable Manufacturing & Product Design. 3 Hours

Design for the environment, sustainable manufacturing processes, and business practices to support these topics are developed. Prerequisite(s): Permission of instructor.

### ISE 441. Production Engineering. 3 Hours

Analysis and design of systems of personnel and machines for production processes. Forecasting, scheduling, production and inventory control. Prerequisite(s): CPS 132; (ISE 300 or MTH 367).

### ISE 455. System Dynamics. 3 Hours

Basic concepts of structure in dynamic systems; starting point for systems approach to dynamic systems in multidisciplinary courses in urban, ecological, corporate, or other social systems.

### ISE 460. Quality Assurance. 3 Hours

Principles of statistical quality control. Application of attributes and variable acceptance sampling plans; control charts; design of quality control systems and procedures. Prerequisite(s): CPS 132; (ISE 300 or MTH 367).

### ISE 461. Design & Analysis of Experiments. 3 Hours

Application of statistical methods to engineering experimentation; analysis of experimental response through statistical methods. Prerequisite(s): CPS 132; (ISE 300 or MTH 367).

### ISE 465. Reliability & Maintainability. 3 Hours

Application of probability and statistical theory to engineering reliability design and analysis; reliability of components and assemblies; design of systems for reliability and maintainability. Prerequisite(s): CPS 132; (ISE 300 or MTH 367).

### ISE 483. Leadership and Engagement for Engineering Diversity. 3 Hours

This course will provide students with an awareness of the barriers, biases and challenges to diversity in engineering, provide strategies that can be used to improve satisfaction in the engineering workplace and in academia; and provide principles and practices that can enhance the students' leadership skills for the engineering workplace. Prerequisite(s): ((ENG 100 or 100B or 114 or 198) or ASI 120)) and ((REL 103 and HST 103 and PHL 103) or ASI 120)) and Junior Status.

**ISE 487. Leading in Technical Environments. 3 Hours**

Understanding and utilizing the keys to leading in technical organizations represents a distinct advantage to individuals and the institutions they serve. Students will be exposed to the underpinning of leadership in engineering environments including tenets, theories, debates, strategies, and innovative techniques. Opportunities to interact with leaders from government and industry will be provided. Practical application skills will be developed.

**ISE 499. Special Problems in Systems. 1-6 Hours**

Particular assignments to be arranged and approved.