IE 3310. Project Management for Engineers.
Basic principles governing the efficient and effective management of engineering projects. Topics include project planning, scheduling, and cost estimation procedures. Prerequisite: ENGR 3315. (WI).
Grade Mode: Standard Letter
Course Attribute(s): Writing Intensive
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Project Management for Engineers

Fundamentals of probability and statistical inference for engineering applications, probability distributions, parameter estimation, hypothesis testing, and analysis of variance. Prerequisite: MATH 2472.
Grade Mode: Standard Letter
about Engineering Statistics
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Grade Mode: Standard Letter
about Engineering Statistics

IE 3330. Quality Engineering.
Quality assurance systems, quality costs, statistical quality control, and approaches for engineering quality into products and processes. Prerequisite: IE 3320.
Grade Mode: Standard Letter
about Quality Engineering
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Quality Engineering

This course teaches models in operations research including linear programs, the simplex method, duality theory, sensitivity analysis, integer programs, and network flows. The emphasis is in learning to recognize, formulate, solve, and analyze practical industrial problems. The course also teaches commercial mathematical programming languages. Prerequisites: CS 1428, MATH 3377, ENGR 3315.
Grade Mode: Standard Letter
about Operations Research
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Operations Research

IE 3360. Methods Engineering and Ergonomics.
This course is a survey of methods for assessing and improving performance of individuals and groups in organizations. Techniques include various basic industrial engineering tools, work analysis, data acquisition and application, performance evaluation and appraisal, and work measurement procedures. Prerequisite: IE 3320.
Grade Mode: Standard Letter
about Methods Engineering and Ergonomics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Methods Engineering and Ergonomics

IE 3310. Statistical Design of Experiments.
Statistically designed experiments for engineering applications. Topics include analysis of variance, randomized complete designs, factorial designs, empirical models generated from controlled experiments, and response surfaces. Prerequisite: IE 3320.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Statistical Design of Experiments

IE 3320. Integrated Production Systems.
Basic concepts in the design and control of integrated production systems to include forecasting, inventory models, material requirements planning, scheduling, planning, and shop floor control. Coverage will include both traditional and kanban systems. Prerequisite: IE 3340.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Integrated Production Systems

IE 3330. Reliability Engineering.
Reliability of components and systems, reliability models, life testing, failure analysis, and maintainability. Prerequisite: IE 3320.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Reliability Engineering

IE 3340. Optimization Techniques.
Mathematical modeling and computational methods for linear, integer, and nonlinear programming problems. Prerequisite: IE 3340.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Optimization Techniques

IE 3350. Supply-Chain Engineering.
The analysis of supply chain problems to include facility location, customer assignment, vehicle routing, inventory management, and the role of information and decision support systems in supply chains. Prerequisite: IE 3340.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Supply-Chain Engineering

IE 3355. Facilities Planning.
Planning, design, and analysis of facilities. Emphasizes the principles and methods used for solving plant layout, facility location, material handling, automation, computer integration, and warehouse operations. Prerequisite: IE 3340.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Facilities Planning

IE 3360. Human Factors Design.
This course will emphasize the applications of human factors engineering to systems design. Prerequisites: IE 3360. (WI).
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
Course Attribute(s): Lab Required|Writing Intensive
about Human Factors Design
Probabilistic models in operations research to include queuing theory, simulation, and Markov chains. Emphasis will be placed on modeling applications to solve problems in industry and computing. Prerequisite(s): IE 3320 and CS 1428.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Probabilistic Operations Research

IE 4380. Industrial Safety.
This course is a survey of occupational safety and hazards control. Topics include the history of occupational safety; hazard sources related to humans, environment, and machines; and engineering management of hazards.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Industrial Safety

IE 4390. Industrial Engineering Capstone Design.
Students form teams and apply industrial engineering principles to develop and implement solutions to industrial problems and/or systems engineering issues. Prerequisites: IE 3310, IE 3330; and at least two of: IE 3340, IE 4310, IE 4310, IE 4355, IE 4370 and MFGE 4396. Corequisites: IE 4320 and IE 4350.
3 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.
Grade Mode: Standard Letter
about Industrial Engineering Capstone Design

IE 4399A. Six Sigma Methodologies.
This course covers the principles and methodologies of Six Sigma. Emphasis is on the tools and techniques used in Six Sigma projects, including statistical process control, experimental design, and project management. Students will develop and complete a Six Sigma project in industry. Prerequisite(s): IE 3310, ID 3330, and ID 4310.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat ProcessingTopics
Grade Mode: Standard Letter
about Six Sigma Methodologies

IE 4399B. Human Computer Interaction.
Introduces the fundamentals of human-computer interaction relative to interactive computer applications and associated interfaces. Principles and methodologies of usability testing will highlight relationships between human factors, design, and cognitive psychology in the development of computer applications. A variety of assessment and validation methodologies are applied. Prerequisite: Faculty advisor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat ProcessingTopics
Grade Mode: Standard Letter
about Human Computer Interaction

IE 4399C. Engineering Statistics II.
This course is the continuation of IE 3320 Engineering Statistics I and covers simple and multiple regression analysis, analysis of variance, 2^k Factorial Experiments, and the use of statistical packages. Prerequisite: IE 3320.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat ProcessingTopics
Grade Mode: Standard Letter
about Engineering Statistics II

IE 4399D. Modern Heuristic Optimization Techniques.
Heuristic methods that search beyond local optima such as simulated annealing, tabu search, genetic algorithms, ant-colony systems, and particle swarm. Papers from the literature, problem-specific heuristics, evaluation methods and serial/parallel implementations are discussed. This course is an advanced undergraduate course for students in engineering and related fields. Prerequisites: IE 3340, CS 1428.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat ProcessingTopics
Grade Mode: Standard Letter
about Modern Heuristic Optimization Techniques

IE 5310. Advanced Statistical Design of Experiments for Engineers.
This course examines the design and analysis of controlled experiments, demonstrating engineering applications of design of experiments (DOE) in the manufacturing and service industries. Topics include full and fractional factorial designs, response surface methodology, and Taguchi methods. In a semester-long project, students apply DOE to improve a real manufacturing process. Prerequisite: ENGR 5310 or instructor's approval. Restricted to students enrolled in the MS Engineering program.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Advanced Statistical Design of Experiments for Engineers

This course covers the methods for modeling and analyzing manufacturing systems. Critical manufacturing issues that are addressed by these models include sustainable production systems, material handling systems, scheduling, and supply chains. Prerequisites: IE 3320, IE 3340, and MFGE 4396; or instructor's approval. Restricted to students enrolled in the MS Engineering program.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modeling and Analysis of Manufacturing Systems

IE 5330. Advanced Quality Control and Reliability Engineering.
This course provides in-depth knowledge in reliability modeling and maintenance optimization for components and systems. The course also covers advanced quality control techniques including multivariate process control. Methodologies are applied to solve practical problems arising from various industry domains. Prerequisite: ENGR 5310 or approval of instructor. Restricted to students enrolled in the MS Engineering program.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Advanced Quality Control and Reliability Engineering
This course introduces students to modeling of linear, non-linear, and integer problems applied to engineering design, manufacturing, service, supply chain, healthcare and electrical systems. Mathematical programming software is emphasized in class exercises, homework, and project. Techniques including revised simplex method, duality theory, sensitivity analysis, and networks are also covered. Prerequisites: CS 1428 and MATH 3377 or approval of instructor. Restricted to students enrolled in the MS Engineering program.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Applied Deterministic Operations Research for Engineers

IE 5343. Non-Linear Optimization Techniques for Engineers.  
This course covers engineering applications of mathematical modeling and computational methods for nonlinear programming problems. The primary goal of this course is to present techniques and strategies essential to optimize non-linear models. Prerequisite: IE 3340 or equivalent, or approval of instructor. Restricted to students enrolled in the MS Engineering program.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Non-Linear Optimization Techniques for Engineers

IE 5345. Advanced Optimization.  
This course covers advanced concepts in linear and integer programming. Solution techniques for stochastic and dynamic programming and formulation and solution of decision models in manufacturing, service, supply chain, healthcare and electrical systems are presented. Prerequisite: IE 5340. Restricted to students enrolled in the MS Engineering program.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Advanced Optimization

IE 5347. Modern Heuristic Optimization.  
This course covers heuristic methods that search beyond local optima such as simulated annealing, tabu search, genetic algorithms, ant-colony systems and particle swarm. Papers from the literature, problem-specific heuristics, evaluation methods, and implementations are discussed. Prerequisite: IE 3340 or equivalent, or approval of instructor. Restricted to students enrolled in the MS Engineering program.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about Modern Heuristic Optimization

IE 5397. System Thinking and Analysis.  
This course is an introduction to systems engineering and the systems thinking process, providing important considerations related to the engineering of large scale systems. These considerations include system understanding, modeling and design, the system development process, needs analysis, concept exploration and definition, design, integration and evaluation, and systems engineering management. Prerequisite: ENGR 5310 or approval of instructor. Restricted to students enrolled in the MS Engineering program.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
about System Thinking and Analysis