

Industrial Engineering (IEEN)

IEEN 5301 Advanced Probs in Indus Eng **1-3 SCH (1-3)**

Individual or group research on advanced problems conducted under the supervision of a faculty member. Maximum credit 6 semester hours.

IEEN 5303 Advance Topics in Indus Eng **1-3 SCH (1-3)**

One or more advanced topics. May be repeated when topic changes.

IEEN 5305 Graduate Research Project **1-3 SCH (1-3)**

Designed for project option students and requires completion of research project. Prerequisite: departmental approval. May be repeated for a maximum of 7 semester hours.

IEEN 5306 Thesis **1-3 SCH (1-3)**

Designed for thesis option students. The course requires completion of thesis research. Prerequisite: departmental approval. May be repeated for maximum of 10 semester hours.

IEEN 5310 Risk Management **3 SCH (3-0)**

This course covers the advanced concepts and theories of the tools and techniques used in risk management at corporate, strategic business and project level and discusses a risk management mechanism for the sequencing of risk assessment through corporate, strategic and project stages of an investment.

IEEN 5311 Standards Prod Design & Manf **3 SCH (3-0)**

Advanced knowledge of standardization, anatomy and framework of standards, standards development process, and strategies to search standards and database.

IEEN 5312 Supply Chain Management **3 SCH (3-0)**

The management of material and information flows in multi-stage production-distribution networks. Provide students with the knowledge and the tools necessary to develop, implement, and sustain strategies for managing supply chain issues, especially the material and inventory management in supply chain.

IEEN 5313 Inventory Systems **3 SCH (3-0)**

Deterministic/stochastic systems with static/dynamic models. Use of forecasting techniques. Practice of inventory management, manual and computerized procedures and MRP. Case studies in inventory systems management. Prerequisite: 3 hours undergraduate Production and Inventory Control or equivalent.

IEEN 5314 Activity Scheduling **3 SCH (3-0)**

Deterministic/stochastic sequencing problems with static/dynamic models. Problems involving single and multiple facilities (flow shop, job shop). Problems involving different measure of effectiveness, solution techniques (optimizing, heuristic). Industrial scheduling problems.

IEEN 5319 Game Theory **3 SCH (3-0)**

An introduction to game theory and strategic thinking. Dominance, Nash equilibrium, normal-form and extensive-form games, repeated games, static games with complete and incomplete information, dynamic games with incomplete information, mechanism design. Prerequisite: Graduate standing or permission from the instructor.

IEEN 5320 Fundamentals Sustainable Eng **3 SCH (3-0)**

Fundamental concepts and definitions in sustainable engineering, approaches and applications of sustainability including societal, environmental and economic sustainability, and new trends in sustainability concept development for engineering.

IEEN 5321 Computer Appl of Stats Methods **3 SCH (3-0)**

Extreme value distributions, multivariate normal distribution, simple and multiple regression analyses, analysis of variance, time series analysis, a survey of nonparametric statistics, chi square, t and F distributions. Prerequisite: undergraduate course in Applied Methods in Engineering Statistics or the equivalent.

IEEN 5322 Compu Simulation of Indust Sys **3 SCH (3-0)**

Introduction to simulation, a survey and application of computer languages suitable for Monte Carlo simulation of random processes, model construction, advantages and shortcomings of simulation techniques, programming with simulation languages.

IEEN 5324 Ergonomics **3 SCH (3-0)**

Application of ergonomic principles to the work environment. Design of the system to fit and interact with the human operator. Collection and utilization of anthropometric data in the design of workstations, tools, safety equipment and VDT workstations. Study of the interaction between human operator and the environment including the effect of noise, improper lighting, vibration, heat and cold on physical and mental performance.

IEEN 5325 System Safety **3 SCH (3-0)**

Application of engineering design and management of industrial prevention models along with ethical responsibilities to eliminate, prevent or control hazards throughout the life cycle of a project, program, procedure or activity.

IEEN 5326 Decision Analysis **3 SCH (3-0)**

Sources of information, prediction and judgment, subjective probability bidding policy. Statistical decision theory including utility functions, risk and uncertainty, min-max and Bayes strategy. Prerequisite: IEEN 5329 or equivalent.

IEEN 5327 Adv Engineering Project Mnmt 3 SCH (3-0)

This course covers the advanced concepts and theories of project modeling and optimization, project scheduling, resource allocation, economic analyses and project decision analysis. Prerequisite: permission of the instructor.

IEEN 5328 Reliability Theory 3 SCH (3-0)

Reliability analysis with emphasis on the exponential, Weibull, gamma, log normal and extreme value distributions; reliability of systems, redundancy; maintainability and availability. Prerequisite: IEEN 5313.

IEEN 5329 Advanced Eng Economic Analysis 3 SCH (3-0)

Continuation of Engineering Economic Analysis including funds flow, utility, price changes, investment, growth, replacement, taxes, capital budgeting and managerial economics. Prerequisite: 3 hours undergraduate course in Engineering Economic Analysis or equivalent.

IEEN 5331 Compu Integrated Manuf Syst 3 SCH (3-0)

Advanced systems concept of Computer Integrated Manufacturing Advanced system, definition of manufacturing and its various levels, planning and control of product movement through the production systems, successful use of Automation, Robotics, Just-In-Time Manufacturing and Knowledge Based Systems. Prerequisite: MEEN 5303.

IEEN 5332 Mfg System Design 3 SCH (3-0)

Systematic description of the underlying behavior of manufacturing systems. Topics include basic factory dynamics, corrupting influence of variability, push and pull production systems, human element in manufacturing systems design and supply chain management.

IEEN 5333 Six Sigma and ISO Standards 3 SCH (3-0)

Introduction to six sigma approach, DMAIC model, ISO standards, and continual improvement philosophy. Study and research on using six sigma to meet ISO 9000, and use the ISO 9000 Framework to Assess a Six Sigma System. Practical case studies and projects will be pursued.

IEEN 5334 Lean Manufacturing 3 SCH (3-0)

Identifying key Lean concepts for manufacturing and defining these concepts for products/process design. Understanding Lean terminology, value stream mapping for manufacturing systems, design of Lean equipment, product cell design, operator job design and five steps to kaizen. Lean manufacturing approach to help reduce manufacturing costs, reduce or eliminate waste and increase profit margins.

IEEN 5335 Principles of Optimization 3 SCH (3-0)

Nonlinear Optimization: convexity, Kuhn-Tucker conditions, theory of duality. Linear and combinatorial optimization. Dynamic optimization. Prerequisite: 6 hours of undergraduate operations research or equivalent.

IEEN 5336 Linear Prog & Extensions 3 SCH (3-0)

Theory of linear programming including the simplex method, duality, sensitivity analysis, decomposition principles, the transportation problems and integer programming. Prerequisite: IEEN 5335 or equivalent.