Industrial, Manufacturing, and Systems Engineering Courses

Courses

IE 1333. Computational Methods.
Computational Methods: Computational methods and algorithms for industrial, manufacturing and systems engineering applications.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

IE 2303. Materls & Manuftng Processes.
Introduction to properties of engineering materials and relationships to their structure, behavior, and processing; materials testing and measurement of properties. Selection of materials for engineering applications considering interrelationships between structure, properties, processing, and performance. Prerequisite: CHEM 1305 with a grade of "C" or better.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (CHEM 1305 w/C or better)

IE 2333. Decision Support Systems.
Decision Support Systems: Decision support systems for industrial, manufacturing and systems engineering applications.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 1333 w/C or better)

IE 2377. Electro-Mechanical Systems.
Principles of electrical circuits, generators, and motors. Introduction to electronics and introduction to micro- processors for data acquisition. Prerequisite: MATH 2312 with a grade of "C" or better.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (MATH 1312 w/C or better)

IE 3331. Systems Engineering.
Systems Engineering (3-0) This course covers all basic concepts of systems engineering . The objective is to provide the basic knowledge and tools for transforming an operational need into a well-defined system configuration, through an interactive design process of issue formulation, analysis, optimization, design synthesis, system integration, and testing.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better)

IE 3332. Safety Engineering.
Safety Engineering (3-0) A study of man-machine environment and the accident cause-effect relationship. Provides an analytic structure through which safety decision-making can be performed in light of changes in the legal, management, and technical aspects of industrial safety. Prerequisite: (BE 3373 or IE 3373) and (CE 2315 or IE 2315 or MECH 1321 or BE 2434) with a grade of C or better
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better) AND (CE 2315 w/C or better) OR (IE 2315 w/C or better) OR (MECH 1321 w/C or better) OR (BE 2434 w/C or better)

IE 3334. Intro to Work Design.
Introduction to Work Design: Work design and measurement, applied to manufacturing and service industries, so as to improve worker performance, health, safety, and maintain productivity.
Department: Industrial Engineering
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 3373 w/C or better) AND (CE 2315 w/C or better) OR (MECH 1321 w/C or better)

IE 3352. Design of Experiments.
Review of the statistical approach to experimental designs. Analysis of variance is introduced as the appropriate method of statistical analysis. Design of experiments is presented with a single factor, with randomized blocks, and with Latin squares. Introduction to factorial designs. Prerequisite: BE 3373 or IE 3373 with a grade of C or better.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 3373 w/C or better)

IE 3373. Engr Probability & Stat Models.
Fundamental concepts of discrete and continuous random variables, distribution functions, moments, moment generating functions, statistical dependence, stochastic modeling and random events, graphical and numerical methods, descriptive and inferential statistics, point and interval estimation, hypothesis testing and regression analysis. The creation and proper utilization of statistical decision models for engineering analysis and design are stressed. Emphasis is on measurement, formulation analysis, and design of physical problems.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (MATH 2313 w/C or better) OR (MATH 2326 w/C or better) AND (IE 2333 w/C or better)

IE 3390. Oper Research I: Deter Models.
Operations Research I: Deterministic Models: An introduction to deterministic optimization models. These include the concepts of operations research modeling, classical optimization, linear and dynamic programming, and network analysis. Current topics in deterministic modeling are included.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (MATH 3323 w/C or better)

IE 3477. Methods and Indust. Ergonomics.
Methods and Industrial Ergonomics (3-3) Introduction to the design and analysis of human-machine systems and interfaces. Application of biomechanics, anthropometry, and work physiology to the design of work. Study of operations and process analysis, methods analysis, and work design techniques used in manufacturing and service industries. Macro and micro motion analyses, work measurement, and the relation to line balancing, machine loading, scheduling and sequencing, management control. Prerequisites: (BE 3373 or IE 3373) and (CE 2315 or IE 2315 or MECH 1321 or BE 2434) with a grade of C or better.
Department: Industrial Engineering
4 Credit Hours
6 Total Contact Hours
3 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better) AND (CE 2315 w/C or better) OR (IE 2315 w/C or better) OR (MECH 1321 w/C or better) OR (BE 2434 w/C or better)

IE 4175. Undergrad Research in IE.
Undergraduate Research in Industrial Engineering (0-0-1) Supervised individual private instruction on research project. May be repeated for credit as topic varies. Prerequisite: Permission of the faculty member who is to supervise the research and departmental approval.
Department: Industrial Engineering
1 Credit Hour
1 Total Contact Hour
0 Lab Hour
0 Lecture Hour
1 Other Hour

IE 4266. Senior Design.
Senior Design: Conceptual, preliminary, and final design solutions to engineering problems by students in teams.
Department: Industrial Engineering
2 Credit Hours
10 Total Contact Hours
6 Lab Hours
0 Lecture Hours
4 Other Hours
Prerequisite(s): (IE 3331 w/C or better) AND (CE 2326 w/C or better)

IE 4334. Work Design- Prod. & Safety.
Work Design- Productivity and Safety: Methods improvement, work measurement, and design, applied to manufacturing and service industries, so as to increase productivity and improve worker health and safety.
Department: Industrial Engineering
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 3373 w/C or better) AND (CE 2315 w/C or better) OR (MECH 1321 w/C or better)

IE 4353. Industrial Systems Simulation.
Industrial Systems Simulation (2-3) Introduction to systems simulation with special emphasis on: logic and methodologies of discrete event simulation, generation of random numbers an random deviates, survey of simulation languages. At the end of the course the student should be able to develop simulation models of industrial systems and to understand the issues involved in simulations studies. Prerequisites: BE 3373 or IE 3373 with a grade of C or better.
Department: Industrial Engineering
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better)

IE 4361. Intl Manufacturing Engineering.
International Manufacturing Engineering (2-3) Practical issues of design, analysis, and integration of international manufacturing engineering components are covered. Emphasis is placed on dynamics of material flow, international planning hierarchies, fundamentals of enterprise resource planning, and the effects of automation on scheduling strategies and materials flow in a labor-intensive environment. Concurrent engineering, function deployment, group technology, process planning, and assembly line design focused on border operations are stressed. A focus on discrete production, with control systems such as MPR, Kanban, JIT, OPT, and synchronous manufacturing are covered. A team project and presentation is required.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 3373 w/C or better) OR (BE 3373 w/C or better)

IE 4371. Engineering Problems.
Engineering Problems (0-0-3) Original investigation of special problems in the student's field; the problem to be selected by the student with approval of the head of the department. May be repeated for credit.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

IE 4384. Industrial Layout.
Industrial Layout (2-3) The design, selection and layout of buildings and equipment for proper utilization in manufacturing. Prerequisite: BE 3373 or IE 3373 with a grade of C or better.
Department: Industrial Engineering
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better)

IE 4385. Statist Quality Cntrl/Reliabil.
Statistical Quality Control and Reliability (3-0) The statistical design of systems for prescribed quality levels and prevention of defects. Prerequisite: BE 3373 or IE 3373 with a grade of C or better
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better)

IE 4390. Oper Research II: Stoch Models.
Operations Research II: Stochastic Models: An introduction to probabilistic optimization including queuing theory, Monte Carlo techniques of simulation, project scheduling, and basic Markov processes. Current topics in probabilistic modeling are included. A project is an integral part of this course.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (IE 3373 w/C or better) OR (BE 3373 w/C or better)

IE 4391. Prod Plan & Inv Cont Systs.
Production Planning and Inventory Control Systems: A study of the principles and theory used in the design and maintenance of production operations and inventory systems. These include forecasting techniques, inventory models, production control models and assembly line balancing.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (BE 3373 w/C or better) OR (IE 3373 w/C or better)

IE 4395. Special Topics Industrial Engr.
Special Topics in Industrial Engineering (3-0) Selected topics of current interest in industrial engineering. Prerequisite: Junior or senior standing in engineering.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

IE 4396. Intl Manufacturing Intern I.
International Manufacturing Internship I (0-0-3) An applied internship in a local manufacturing plant where a student applies the international manufacturing and engineering fundamentals from IE 4360 and 4361. The student intern will rotate between two departments in a US offshore manufacturing facility from testing and inspection, design, quality, production and inventory control, maintenance, purchasing, planning and scheduling, safety and ergonomics tooling, accounting, etc. The mid-term and final examinations will consist of a written report and presentation bassed on the research/design/analysis performed in a department to the faculty mentor and industrial partner. Must be admitted to the International Manufacturing Certificate Internship Program.
Department: Industrial Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

IE 4466. Senior Design.
Senior Design (2-6) Conceptual, preliminary, and final design solutions to engineering problems by students in teams. Prerequisite: Students must be in their last full semester (semester of graduation) and must have a 2.0 GPA or better overall and in their major.
Department: Industrial Engineering
4 Credit Hours
8 Total Contact Hours
6 Lab Hours
2 Lecture Hours
0 Other Hours