

Department of Industrial and Enterprise Systems Engineering

Elective Course Offerings

Fall 2007

For more detail, see posted notices, contact instructor, or consult <http://courses.uiuc.edu/cis/index.html>.

GE Undergraduate Curriculum

+ Course is a Design Elective

IE Undergraduate Curriculum

* Course is a Human Factors Elective

Course is a Manufacturing Elective

^ Course is an Operations Research Elective

@ Course is an M&IE Elective

& Course is a Technical Elective

Some courses may fit into several categories, but you may not use one course to fulfill more than one requirement.

UNDERGRADUATE ELECTIVES

GE 199, X: *Creative Mechatronics*

This course will introduce students to mechatronics (integrated mechanical and electronic devices) through a series of projects and labs. The projects will involve designing, building, and testing a variety of mechatronic devices, with an emphasis on creativity and aesthetics. The projects will combine sensory input (e.g., light, sound, proximity, etc.) with output actuation (e.g., position, orientation, speed, light/sound generation, etc.). Elements of feedback and control will be utilized in some projects. A series of labs will cover sensors, actuators, fabrication skills, and introductory mechanical and circuit analysis. Prior experience with model building or other hands-on construction skills is desirable. First year Discovery Program Course. Students should enroll in only one Discovery Course.

Credit: 3 hrs

Restrictions: Freshmen only

CRN: 42847

Meets: 12:00-1:15 TR TBA

Instr: S. Burns

GE 361, RLP: *Interper Skills & Emot Intel*

Through innovative experiences both in and out of the classroom, *Engineering Emotional Intelligence* will help you determine your own EQ (Emotional Quotient), and show you how to develop the interpersonal, communications and leadership skills crucial for personal and professional success.

Credit: 3 hrs

Restrictions: Sophomore Standing and above in the COE

CRN: 30288

Meets: 4:00-5:15 MW TBA
Lab to meet Sat. TBA TBA

Instr: R. Cordova-Wentling

GE 398, LF: *Intro to Financial Engineering*

This is an introductory course to mathematical models and computational techniques in financial engineering. Topics include derivative securities, binomial option pricing model, the Black-Scholes-Merton option pricing model, exotic options, monte carlo simulation.

Credit: 3 hrs

Prerequisite/Restrictions: GE 331 or IE 300; undergraduates only

CRN: 49131

Meets: 1:00-2:15 TR 101 TB

Instr: L. Feng

GE 398, RLP: *Engaging Leaders*

Credit: 1 hr

Restrictions: Junior standing and above

CRN: 39684

Meets: 12:00-12:50 T 203 TB

Instr: R Price

GE 410, E: *Component Design + &*

Design of basic engineering components: structural members, machine parts, and connections. Principles applied include: material failure (yield, fracture, fatigue); buckling and other instabilities; design reliability; analytical simulation.

Credit: 3 hrs

Prerequisite: GE 311 and GE 320

CRN: 30294 Meets: 1:00-1:50 MWF 101 TB Instr: TBA

GE 420, AE1: *Digital Control of Dym System + &*

Examines theory and techniques for control of dynamic processes by digital computer; linear discrete systems, digital filters, sampling signal reconstruction, digital design, state space methods, computers, state estimator, laboratory techniques.

Credit: 4 hrs Prerequisite: GE 320

CRN: 32187 (AE1-Lec) Meets: 10:00-10:50 MWF 101 TB Instr: TBA
32180 (AB1-Lab) ARR
32182 (AB2-Lab) ARR
32184 (AB3-Lab) ARR

GE 421, AL1: *Introduction to Robotics &*

Fundamentals of robotics, rigid motions, homogeneous transformations, forward and inverse kinematics, velocity kinematics, motion planning, trajectory generation, sensing, vision, and control. *Same as ECE 470.*

Credit: 4 hrs Prerequisite: MATH 415 or 418; ECE 210 or GE 320; or consent of instructor.

CRN: 36965 (AL1-Lec) Meets: 11:30-12:50 TR 260 Everitt Lab Instr: M. Spong
36931 (AB1-Lab) 1:00-2:50 T 267 Everitt Lab
36951 (AB2-Lab) 1:00-2:50 R 267 Everitt Lab
41575 (AB3-Lab) 3:00-4:50 T 267 Everitt Lab.

UNDERGRADUATE - GRADUATE ELECTIVES

GE 411, U & G1: *Intro to Reliability Eng*

An introduction to concepts in engineering design, testing, and management for highly reliable components and systems. *Same as IE 435.*

Credit: 3 hrs Prerequisite/Restrictions: GE 331 or IE 300; undergraduates only

CRN (U): 37669 Meets: 2:00-3:20 TR 203 TB Instr: B. Hall

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Credit: 4 hrs Prerequisite/Restrictions: GE 331 or IE 300; graduates only

CRN (G1): 37670 Meets: 2:00-3:20 TR 203 TB Instr: B. Hall

**GE 498, AA & AEA:** *Decision Analysis I ^*

Decision Analysis I is the first course in the sequence of decision analysis classes. Throughout the course, we will develop rules of thought that will transform complex decisions into simpler decision situations where the course of action is clear. We will create powerful distinctions that will improve your personal decision making and enable you to help others with their own decisions.

Credit: 3 hrs

CRN (AA): 41445 Meets: 2:00-3:20 TR TBA Instr: A. Abbas

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Credit: 4 hrs

CRN (AEA): 42751 Meets: 2:00-3:20 TR TBA Instr: A. Abbas

GE 498, AY: *Introduction to Systems & Entrepreneurial Engineering*

Credit: 4 hrs Restrictions: Senior or graduate standing in the College of Engineering

CRN: 40003 Meets: 3:00-4:15 MW 203 TB Instr: A. Yassine

Course enrollment is by application only, due March 16th. The first course may be taken separately, however, room in the second course is not guaranteed. Priority will be given to students planning to register in the two course sequence.

GE 598, BAV: *Managing Advanced Technology in Industry*

This course will focus on the business side of managing advanced technology in industry, introducing students to: the strategic context of advanced technology; analytic financial tools used to estimate the potential value of advanced technology; legal tools important in managing advanced technology; interpersonal issues related to leading, and advocating on behalf of, advanced technology groups.

Credit: 1 hr Prerequisite: Graduate Standing in Engineering
CRN: 40015 Meets: 3:00-5:15 F 101 TB Instr: B. Vojak
(Aug 22-Oct 7)

GE 598, FEM: *Financing for Engineering Managers*

This class covers the cornerstone concepts of finance for engineers managing new or mature technology companies. A total of 16 segments of 1 hour each will cover topics including: reading and analysis of balance sheets, income statements, day-to-day operations of practical accounting and finance, valuation concepts for new ventures including pre/post funding valuation, term sheet items, etc. The class will also cover the foundational concepts of portfolio analysis. This course applies to the GE/TEC graduate certificate program in Strategic Technology Management.

Credit: 2 hrs Prerequisite/Restrictions: Probab & Statistics including MATH 463, STAT 400 or equivalent; Grad standing
CRN: 41135 Meets: 1:00 – 2:50 W TBA Instr: J. Morris

GE 598, HMK: *Optimal Product Design & Development*

This course is designed to address the fundamental theories for optimal product realization (planning, design and development): 1) Product planning involves demand modeling, customers' preference analysis, and profit modeling under uncertainty, 2) Product design involves the fundamentals of engineering optimization theory, 3) Product development involves analytical problem formulation to achieve the performance targets assigned at the enterprise level and the engineering design level. Students will learn core components of modeling, solving, and validating optimization models in a mathematically rigorous manner. Individual or group semester project is required.

Credit: 3 hrs Prerequisite: MATH 225 or equivalent; graduate standing in engineering or consent of instructor if senior. Prior knowledge of optimization will be helpful, but not required.
CRN: 42849 Meets: 1:00-2:20 TR TBA Instr: H. Kim

GE 598, IS1: *Technology Innovation and Market Strategy*

How do new ventures become successful?
Why do large established firms fail?
Why are some firms more profitable than others?
When is it more profitable to be an innovator vs. a fast follower?
Who is a lead user?
What is technology adoption life cycle?
When should a new technology be standardized?
This course answers these questions and covers the principles, practices, and strategies of technology commercialization for new companies as well as larger corporate environments. Course content includes a review of common market-oriented strategies and analysis of their drawbacks, accepted best practices for new product introduction, principles of innovation, the framework of sustaining versus disruptive technologies, and strategic technology management. This course applies to the GE/TEC graduate certificate program in Strategic Technology Management, and qualifies as a general elective.

Credit: 2 hrs Restrictions: Graduate standing
CRN: 40010 Meets: 1:00-2:50 F TBA Instr: S. Chopra

GE 598, JPK: *Legal Issues in Entrepreneurship*

Credit: 3 hrs Restrictions: Graduate standing

CRN: 40007

Meets: 10:00-11:15 MT TBA

Instr: J. Kesan

GE 598, RSS: *Topics in Discrete Event Dynamic Systems*

Credit: 3 hrs

Restrictions: Graduate standing

CRN: 49160

Meets: 1:00- 2:15 MW

Instr: R. Sreenivas

IE 510, L: *Applied Nonlinear Programming*

Optimization of nonlinear systems, including a survey of classical methods and concepts such as the Lagrangian method, the Jacobian method, and Kuhn-Tucker conditions; emphasizes modern algorithms, numerical methods for digital computers, applications in engineering design, and use of state-of-the-art computer codes.

Credit: 4 hrs

Prerequisite: IE 310 or equivalent or consent of instructor.

CRN: 42952

Meets: 1:00-2:50 TR TBA

Instr: TBA

IE 512: *Sys Method and Network Techniq*

Study of basic concepts, theories, and techniques of systems analysis, including modeling of large scale systems, forecasting, planning, control, and information handling; emphasizes the modeling of systems with network techniques, including distance, flow, and project networks. Discusses advanced network topics such as out-of-kilter algorithm and project resource analysis. *Same as CEE 516.*

Credit: 4 hrs

Prerequisite: IE 361 or CEE 201 or equivalent; or consent of instructor.

CRN: 35414

Meets: 10:00-11:50 TR 203 TB

Instr: TBA

03/09/07:ht