DEPARTMENT OF INDUSTRIAL ENGINEERING AND LOGISTICS
MANAGEMENT

- Undergraduate Courses
- Postgraduate Courses
Undergraduate Courses:

IELM 001 Academic and Professional Development I [0 credit]
[Previous Course Code: IEEM 001] A compulsory one-year course for IELM students. This course aims to provide academic and professional advising to students and to develop their technical and non-technical communication skills. Industrial and academic seminars will be offered. Graded P or F.

IELM 002 Academic and Professional Development II [0 credit]
[Previous Course Code: IEEM 002] A compulsory one-year course for IELM students, which is a continuation of IELM 001. Graded P or F.

IELM 099 Industrial Training [0 credit]
[Previous Course Code: IEEM 099] For students of the IELM Department only. A practical training course of a total duration of ten weeks including safety, CAD, engineering drawing, metal cutting and fitting practice, electronic product assembly manufacturing techniques, database applications, tools and practices of system integration, internet for industrial and commercial applications, manufacturing resources planning, and implementing and administering network servers. Graded P or F.

IELM 101 Industrial Engineering and Modern Logistics [3-0-0-3]
[Previous Course Code: IEEM 101] For non-IELM students only. Trace the evolution of technology management ideologies and techniques, and their synergy with industry development, from manufacturing in early days to logistics and supply chain management lately. Use case studies throughout to illustrate how industrial engineers solve problems in their functional domains.

IELM 110 Computing in Industrial Applications [2-0-3-3]
[Previous Course Code: IEEM 110] Introduction to microprocessor technologies and computer hardware with industrial applications. Computer systems for industrial control. Local area networks and communication. C programming primarily by self-study.

IELM 115 Product Design and Communication [2-0-3-3]
[Previous Course Code: IEEM 115] Fundamentals of product design from an industrial engineering perspective, including market research and communication, process design and evaluation, design for manufacturability/assembly, design for usability and safety, aesthetics design, and design for reuse. Methods and theories of design and case studies are presented.

IELM 120 Engineering Management [3-0-0-3]
[Previous Course Code: IEEM 120] For Science and Engineering students only. Techniques relating to managing engineering activities; engineering managerial functions, productivity assessment/improvement, managing the quality function and communications.

IELM 141 Logistics and Freight Transportation Operations [3-1-1-3]
[Previous Course Code: IEEM 141] Introduction to intermodalism, globalization, third-part logistics, carrier logistics, shipper logistics, manufacturing logistics, supply chain management, and rules, conventions and practices in various transportation modes. Discussion of characteristics, issues, and practices of air cargo systems, surface transportation systems, sea freight operations, and terminal operations.

IELM 151 Engineering Probability and Statistics [3-1-0-4]
[Previous Course Code: IEEM 151] This is a systematic introduction to basic probability theory and statistics for engineering, including data collection and analysis, sample space and sampling methods, calculus of probability, conditional probability, expectation, moments, discrete and continuous probability distributions, point and interval estimation, hypothesis testing and linear regression analysis. Exclusions: BISC 215, ISMT 111, MATH 144, MATH 241 Prerequisites: AL Pure Mathematics; AL Applied Mathematics; MATH 021/006/011; or MATH 023 and MATH 024

IELM 201 Operations Research I [3-1-0-3]
[Previous Course Code: IEEM 201] Introduction to deterministic optimization modeling and algorithms. Topics include linear programming, dynamic programming, network flows, and some nonlinear models. Application softwares. Exclusions: IELM 202, ISMT 271

IELM 202 Introduction to Operations Research [2-1-0-2]
[Previous Course Code: IEEM 202] This course provides elementary introduction to deterministic models in operations research. Topics cover linear programming, dynamic programming network flows, and some nonlinear programming. The focus of this course is more on applications and less on theories. Exclusions: IELM 201, ISMT 271

IELM 213 Ergonomics in Work Place Design [2-0-3-3]
[Previous Course Code: IEEM 213] Introduction to ergonomics, biomechanics and work physiology. Cumulative trauma disorders. Work environment stressors and their reduction in the workplace. Introduction to tool design. Prerequisite: IELM 151

IELM 215 Manufacturing Processes I [2-0-3-3]
IEM 223  Engineering Economy [3-0-0:3]  

IEM 225  Operations Research II [3-1-0:3]  
[Previous Course Code: IEMM 225]  Poisson process, Markov process, and Markov decision processes; inventory theory, reliability, queuing theory. Application softwares. Prerequisite: IELM 151 or MATH 144

IEM 227  Quality Engineering [3-1-1:3]  
[Previous Course Code: IEMM 227]  Control charts and statistical on-line quality control methods, off-line quality control and parameter design, modern quality philosophy and Taguchi method. Exclusion: ISMT 263 Prerequisite: IELM 151 or MATH 144

IEM 230  Industrial Data Systems [2-0-3:3]  
[Previous Course Code: IEMM 230]  Fundamental concepts on database, network, object-oriented methodology, and system integration; design and development of database systems for productions (e.g. MRP), manufacturing (e.g. CAPP), and management (e.g., BPR). Exclusions: ISMT 226, COMP 231 Prerequisites: COMP 102 and COMP 103

IEM 241  Routing and Fleet Management [3-1-0:3]  
[Previous Course Code: IEMM 241]  Applications and algorithms for network optimization, vehicle routing, shortest path problems, maximum flow problems, matching models and dynamic vehicle allocation. Prerequisite: IELM 201

IEM 245  Logistics Planning and Service Management [3-0-0:3]  
[Previous Course Code: IEMM 245]  Supply management, purchasing, store management, distribution of goods and services, pricing; productivity in services, training and services logistics. Exclusion: ISMT 366

IEM 300  Special Topics [0-4 credit(s)]  
[PreviousCourse Code: IEMM 300]  Selected topics of current interest. May be repeated for credit if different topics covered.

IEM 310  Integrated Production Systems [3-1-0:3]  
[Previous Course Code: IEMM 310]  Basic concepts and techniques in design and operational control of integrated production systems, including MRP, JIT, forecasting, production planning, inventory control, and shop floor control and scheduling. Exclusions: ISMT 161, ISMT 162 Prerequisite: IELM 201 Pre-/Co-requisite: IELM 225

IEM 311  Engineers in Society [1-0-0:1]  
[Previous Course Codes: IEMM 311]  For Engineering students only. This is a series of seminars presented by professionals from social and engineering sectors and faculty members on topics including the introduction to local industry, responsibility and accountability of a profession in engineering, professional ethics, the impact of information technology revolution on society and engineering, legal aspects of engineering, business fundamentals, project management, product engineering and quality assurance, and environmental and occupational risk management. Graded P or F.

IEM 313  System Simulation [3-2-0:3]  
[Previous Course Code: IEMM 313]  Design of continuous and discrete simulation models, statistical foundations and methodology, generation of random variables, simulation experiments, test of hypotheses, analysis of simulated time series, programming languages. Pre-/Co-requisite: IEMM 225

IEM 317  Product Design and Lifecycle Management [2-0-3:3]  
[Previous Course Code: IEMM 317]  This course covers different aspects of product development management. Topics include innovation management, techniques for idea generation, CAD, product lifecycle management, rapid prototyping and organizing and managing the development teams. Also projects and business plans will be carried out in the course.

IEM 320  Facilities Layout and Material Handling [3-0-1:3]  
[Previous Course Code: IEMM 320]  Facility location, process and material flow analysis, space allocation and plant layout, computerized layout planning, material handling equipment, material handling system design. Prerequisite: IELM 201

IEM 331  Electronic Commerce [3-0-3:3]  
[Previous Course Code: IEMM 331]  Introduction to contemporary technology (such as EDI, Internet/Intranet/Extranet, Digital Library, Client/Server, etc.) of electronic commerce and practical applications in manufacturing, transportation and service industry. Exclusions: IEMM 300J (2000-01), ISMT 231 Prerequisite: COMP 102 or COMP 104

IEM 341  Global Supply Chain Management [3-0-0:3]  
[Previous Course Code: IEMM 341]  An introduction to the design, development, and management of integrated logistics supply chain systems, including inventory management, distribution channels, and information systems. Emphasis on the impact of e-business on companies and industries, especially how the Internet changes the way in which goods and services flow through the value chain from manufacturers to customers. Exclusions: EEMT 530, ISMT 367 Prerequisite: IELM 310
IELM 365  Cognitive Engineering and Human Performance  [2-0-3-3]

IELM 391  Logistics Management and Engineering Project I  [0-0-9-3]
[Previous Course Code: IEEM 391]  (Students admitted in 2006-07 should follow this course)  A final year project related to logistics management and engineering supervised by a faculty member. A project proposal and a final report are required. Graded PP.

IELM 391  Logistics Management Project I  [0-0-9-3]
[Previous Course Code: IEEM 391]  (Students admitted prior to 2006-07 should follow this course)  A final year project related to transportation logistics management supervised by a faculty member. A project proposal and a final report are required. Graded PP.

IELM 392  Logistics Management and Engineering Project II  [0-0-9-3]
[Previous Course Code: IEEM 392]  (Students admitted in 2006-07 should follow this course)  Continuation of IELM 391. A project report and a final report are required. Prerequisite: IELM 391

IELM 392  Logistics Management Project II  [0-0-9-3]
[Previous Course Code: IEEM 392]  (Students admitted prior to 2006-07 should follow this course)  Continuation of IELM 391. A project report and a final report are required. Prerequisite: IELM 391

IELM 395  Industrial Engineering Special Project  [1-4 credit(s)]
[Previous Course Code: IEEM 395]  A special project supervised by a faculty member. A project proposal and a final report are required. May be repeated for credit if the projects cover different topics.

IELM 397  Industrial Engineering Project I  [0-0-9-3]
[Previous Course Code: IEEM 397]  A final year project supervised by a faculty member. A project proposal and a final report are required. May be graded PP.

IELM 398  Industrial Engineering Project II  [0-0-9-3]
[Previous Course Code: IEEM 398]  Continuation of IELM 397. A project report and a final report are required. Prerequisite: IELM 397

Postgraduate Courses:

IELM 511  Information System Design  [2-0-3-3]
[Previous Course Code: IEEM 511]  Systems engineering methodology applied to the design of information systems for the management of all types of organizations. Data base management systems. Different phases of system design and implementation.

IELM 517  Advanced Production Planning and Control  [3-0-1-3]
[Previous Course Code: IEEM 517]  Operation mission and modern production planning and control systems. MRP, JIT, and OPT methods. Integrated processes and systems design. Software packages will be introduced through a simulated company environment. Exclusion: ISMT 561

IELM 523  Deterministic Models in Operations Research  [3-0-0-3]
[Previous Course Code: IEEM 523]  This course focuses on the theory and the use of deterministic models for real life decision making problems. It covers linear, integer, combinatorial and nonlinear programming. Prerequisite: IELM 201

IELM 525  Stochastic Models in Operations Research  [3-0-0-3]
[Previous Course Code: IEEM 525]  Poisson processes, renewal processes, Markov processes. Fundamental concepts and applications of these stochastic processes demonstrated through examples in queueing, inventory and reliability models. Background: MATH 144

IELM 526  Design and Analysis of Engineering Experiments  [3-0-0-3]
[Previous Course Code: IEEM 526]  Fundamental principles of planning, designing, and analyzing statistical experiments. Probability distributions, tests of hypotheses, analysis of variance, and the applications using randomized block, factorial, and fractional factorial experimental designs. Background: MATH 144 Exclusion: EESM 526

IELM 531  Total Quality Management  [3-0-0-3]
[Previous Course Code: IEEM 531]  Strategic importance and economic impacts of quality, managerial issues in planning and designing quality assurance systems, control of quality systems, employee involvement, statistical concepts in design for quality, inspection, process control, and ISO 9000. Exclusion: EESM 531

IELM 532  Design for People  [3-0-0-3]
[Previous Course Code: IEEM 532]  Application of ergonomic principles to the manufacturability of equipment. Introduction to work, workstation, tool and equipment design. Other topics include cumulative trauma disorders and their prevention, job and task analysis and lifting. Background: IELM 213

IELM 538  Technical Management  [3-0-0-3]
[Previous Course Code: IEEM 538]  Fundamental aspects of technical management in a knowledge based economy. Topics include defining technology strategy and program objectives, planning, staffing, budgeting, organization, motivation, leadership, implementation, review and evaluation, and promoting innovation and
entrepreneurship.

IELM 550  Global Manufacturing  [3-0-0:3]
[Previous Course Code: IEEM 550] Planning and Design of Supply Chain and Product Development. Apply information technology for remote management. Students will engage in real life projects. Requires instructor’s consent for course enrollment.

IELM 552  Human-Computer Systems  [3-0-0:3]

IELM 557  Network Optimization in Transportation Systems  [3-0-0:3]
[Previous Course Code: IEEM 557] Modeling and algorithms for network problems in transportation systems, including shortest routing, linear and nonlinear flow problems, decomposition methods, dynamic routing strategies, traffic equilibrium, and vehicle management. Background: IELM 201

IELM 600  Special Topics in Manufacturing Systems  [1-3 credit(s)]
[Previous Course Code: IEEM 600] Selected topics of current interest. May be repeated for credit if different topics covered.

IELM 610  Special Topics in Systems Engineering/Operation Research  [1-3 credit(s)]
[Previous Course Code: IEEM 610] Selected topics of current interest. May be repeated for credit if different topics covered.

IELM 620  Special Topics in Engineering Management  [1-3 credit(s)]
[Previous Course Code: IEEM 620] Selected topics of current interest. May be repeated for credit if different topics covered.

IELM 630  Special Topics in Transportation Logistics Management  [1-3 credit(s)]
[Previous Course Code: IEEM 630] Selected topics of current interest. May be repeated for credit if different topics covered.

IELM 680  Departmental Seminar  [1-0-0:0]
[Previous Course Code: IEEM 680] Series of seminars by faculty and guest speakers, repeated every semester. Research postgraduate students are expected to attend regularly and register for at least two semesters. Graded P or F.

IELM 685  Advanced Seminar  [2-0-0:0]
[Previous Course Code: IEEM 685] An in-depth study of a current research area in Industrial Engineering and Logistics Management. Offerings are announced each semester. Graded P or F.

IELM 690  Research Project  [1-3 credit(s)]
[Previous Course Code: IEEM 690] An independent research project carried out under the supervision of a faculty member. This course is only available for exchange, visiting and visiting internship students.

IELM 695  Independent Study  [1-3 credit(s)]
[Previous Course Code: IEEM 695] Selected topics in industrial engineering and engineering management studied under the supervision of a faculty member. Graded P or F. (Only one independent study course may be used to satisfy the course requirements for any postgraduate program in the Department of Industrial Engineering and Logistics Management.)

IELM 698  MSc Industrial Engineering Design Project  [0-0-12:6]
[Previous Course Code: IEEM 698] Independent research project carried out under the supervision of a faculty member. Should be relevant to industrial applications of IE disciplines. Normally taken at end of program.
