

Industrial Engineering Undergraduate Course Descriptions

GENERAL COURSES

INEG2101 Principles of Industrial Engineering

Considers the past and present roles of the professional industrial engineer and evaluates future trends. Introduces courses to follow and shows their relationship to the systems analysis problems encountered. Corequisite: Lab component.

INEG4904 Industrial Engineering Design

Comprehensive design problem for an industrial enterprise; integration of preceding courses through development of physical systems and organizational characteristics, financial aspects, product analysis, equipment selection, production layout, distribution systems, and overall economic analysis. Students must be in last long semester of degree program. Prerequisite: INEG 4543 and INEG 4623.

INEG400VH Honors Thesis

For Honors College students majoring in Industrial Engineering only. Prerequisite: Honors college students only.

ENGINEERING MANAGEMENT COURSES

INEG2403 Industrial Cost Analysis

Use of accounting information for planning and control with emphasis on the engineering viewpoint; introduction to general accounting procedures; principles of cost accounting and other aspects of production costs; budgeting, depreciation, taxes, distribution of profits, securities, sources of corporate capital, interpretation of financial statements, and other related topics. Laboratory required. Corequisite: Lab component.

INEG3113 Law and Ethics

Analysis of the fundamental legal principles applicable in protecting the rights and interests of engineers and their employers; formation and discharge of contracts; agency relationships; torts; labor laws; patents; trademarks; copyrights; unfair competition, ethics; and professional relations. Prerequisite: junior standing.

INEG3413 Engineering Economic Analysis

Economic aspects of engineering, including current economic problems and the treatment of estimates when evaluating alternative courses of action. Methods of selection and replacement of equipment and break-even points of operation; desirability of new processes or projects where asset life, rate of return on investment, and first, fixed, differential, marginal, and sunk costs must be considered. Corequisite: Drill component. Prerequisite: MATH 2554.

INEG3833 Data Processing Systems Engineering

Design and analysis of database management systems. Information systems applications development in inventory systems, shop floor control, production scheduling, and various corporate databases. A relational database management system such as Oracle or Access is used. Prerequisite: Computer Elective II.

INEG4323 Quality Engineering and Management

Provides the student with complete coverage of the functional area of "Quality Assurance" ranging from the need for such a function, how it works, techniques utilized, and managerial approaches for insuring its effectiveness. Prerequisite: senior standing.

INEG4423/4423H Advanced Engineering Economy

Preparation of feasibility studies, including cost estimation, risk and uncertainty, sensitivity analysis and decision making. Effects of taxes, depreciation and financing costs on cash flows. Prerequisite: INEG 3413.

INEG4433/4433H Systems Engineering and Management

Studies of cases in engineering administration emphasizing human relationships in a technical environment. Productivity/quality enhancement through an understanding of organizational design and behavior, motivation and reward systems, and participative management. Prerequisite: Senior standing.

INEG4443/4443H Project Management

Analysis of the strategic level of engineering management including environment, planning, organization, and staffing. Professional creativity, motivation, leadership, and ethics are explored. At the tactical level, project selection, control and systems management are analyzed. Organizational behavior and models related to scientific and professional employees are examined. Prerequisite: Senior standing.

INEG4453 Productivity Improvement

Analysis of common productivity problems. Development of skills required to diagnose problems; measure productivity; develop improvement strategies; and provide for the implementation and maintenance of productivity measurement and improvement systems. Prerequisite: Senior standing.

HUMAN FACTORS COURSES

INEG3713 Methods and Standards

Fundamental rules of motion economy; motion analysis by means of charts; diagrams; work place design; tool and equipment selection; operator selection; and job description and analysis. Fundamentals of time study; observed and synthetic times; use of standard data and time formula; leveling, rating, allowances; and computer program development of latest electronic time study equipment. Laboratory required. Corequisite: Lab component. Prerequisite: INEG 3313.

INEG4223/4223H Occupational Safety and Health Standards

Survey of existing and proposed standards by examining fundamental physical, economic, and legal bases. Performance vs. specific standards. Enforceability and data collection. National consensus and promulgation process. Includes a computer-based design project. Prerequisite: PHYS 2054 or graduate standing.

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INEG4343 Introduction to Human-Computer Interaction

Fundamental theory and practice of the design, implementation, and evaluation of human-computer interfaces, with emphases on the importance of good interfaces and the relationship of interface design to effective user interaction with computers.

INEG4723 Ergonomics

The capabilities and limitations of humans are addressed in the context of the person's interaction with machines and the environment. Topics of discussion include anthropometric considerations in equipment design, human sensory and physiological capabilities in the work environment, selection and training of workers, and the design of controls and displays. Corequisite: Lab component. Prerequisite: INEG 3713 and INEG 4333.

MANUFACTURING COURSES

INEG3513 Manufacturing Design and Processes

Fundamental topics of manufacturing design and processes; the effects of manufacturing processes on product design and cost; engineering design and CAD as well as product inspection; and quality control. Engineering materials, comprehensive manufacturing processes including metal machining, casting, and forming. Laboratory required. Corequisite: Lab component Prerequisite: PHYS 2054.

INEG3523 Manufacturing Systems

Fundamental topics of manufacturing systems, classifications and analysis of automated manufacturing systems. Introduction to automation, hardware components of manufacturing systems, industrial control systems as well as applications on NC part programming, industrial robots, and PLC programming. Laboratory required. Corequisite: Lab component Prerequisite: INEG 3513.

INEG4243 Automated Manufacturing

Introduction to manufacturing processes and concurrent engineering in the electronics industry. Survey of electronics components and products and the processes of fabrication and assembly. Principles of design, productivity, quality, and economics. Emphasis on manufacturability. Prerequisite: INEG 3513.

INEG4533 Application of Machine Vision

Automated machine vision applied to assembly and inspection tasks traditionally performed by human operators; development of application by acquiring image, processing image data, analyzing image and transmitting results; application analysis, selection and economics. Laboratory required. Corequisite: Lab Component. Prerequisite: Senior standing.

INEG4543 Materials Handling

Equipment, systems, problems, and analysis of industrial material handling, with emphasis upon manufacturing. Vehicles, containers and racks, conveyors, overhead systems, and miscellaneous equipment. Criteria for selection and

decision models. Laboratory required. Corequisite: Lab Component. Prerequisite: INEG 3413, 3713 and 4523.

INEG4563 Application of Robotics

Industrial robotics, programming and applications; tooling and interfacing with peripheral equipment; sensor technology; machine vision; application analysis; selection, and justification; research; economics; and human interface. Laboratory required. Corequisite: Lab component. Prerequisite: Senior standing.

MATHEMATICAL MODELING COURSES

INEG3313 Engineering Statistics

Fundamentals of probability and distribution theory with applications to various branches of engineering; experimental procedures and sample size; statistical decision theory including significance testing and estimation. Drill required. Corequisite: Drill component. Prerequisite: MATH 2564.

INEG3333 Industrial Statistics

Application of statistical techniques to industrial problems; relationships between experimental measurements using regression and correlation theory and analysis of variance models; emphasis on inherent variability of production processes; control chart techniques and the use of exponential and Weibull models in reliability analysis; acceptance sampling procedures. Prerequisite: INEG 3313.

INEG3613 Introduction to Operations Research

Simplex method of linear programming, dual problem and sensitivity analysis, transportation and assignment problems, game theory and linear programming; introduction to dynamic programming; deterministic and probabilistic inventory models; project control with PERT/CPM. Prerequisite: INEG 3313.

INEG4553 Production Planning and Control

Operational problems of production systems including a control of purchased materials inventory; scheduling a job shop, batch, and continuous production processes for single and multi-item product lines; planning of work force and inventory under seasonal and stochastic demand. Pre or Corequisite: INEG 3613.

INEG4623/4623H Introduction to Simulation

Elementary queuing models derivations and applications. Discrete simulation techniques. The SIMNET simulation language. Applications of simulation to the design of industrial and service installations. Simulation Project. Prerequisite: CSCE 1123. Pre or Corequisite: INEG 3333.

INEG4633 Transportation Logistics

Topics in transportation logistics of interest to engineers: routing and location analysis, fleet sizing, logistics facilities design, applications of Geographic Information Systems (GIS) and Global Positioning System (GPS) technologies to transportation systems modeling and analysis. Prerequisite: INEG 3613.