Course-Contents

IE201 Principles of Economics I

3 Lecture hours per week (3+6) 9 units

Contents:

- An introduction to economics principles, problems and polices with emphasis on the monetary system and national income theory and measurement.
- Simple demand and supply theory.

IE202 Principles of Economics II

2 Lecture hours per week (2+4) 6 units

Contents:

- A continuation of IE 201 with emphasis on price, production, and distribution theories and international economics.

IE204 Introduction to Industrial Engineering

2 Lecture hours per week (2+4) 6 units

Contents:

- A comprehensive introduction to industrial engineering, includes such topics as industrial engineering systems and functions, plant location and layout, materials handling, work methods and measurement, cost analysis and reduction techniques, production planning and control, and principles of operation research including an introduction to linear programming.
- Areas of application of industrial engineering in industrial and non-industrial sectors.

IE207 Mechanical Workshop	
3 Laboratory hours per week (3+3) 6 units	Prerequisite(s): ME102
Contents:	

- The venire principle, tools used in measuring (micrometers and venire calipers) limits and fits.
- Gauging.
- Use of various hand tools, fitting principles of location and clamping, location and clamping devices.
- Basic structure of machine tools.
- Setting of cutting tools, tools and cutter grinding.
- Use of various machines such as lathe, milling machine, shaper, grinding machine, drilling machine, etc., planning and operation sequences.
- Soldering and brazing, methids of welding weld joints.
- Gas welding.
- Arc welding TIG and MIG processes.
- Spot welding.

IE208 Manufacturing Processes	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): ME203, IE207
Contents:	

- Inotroduction: Classification of manufacturing processes.
- Casting: Preparation and melting of metal, sand casting process cooling characteristics of casting, special casting processes, forging plastic deformation of metals.
- The forging process classification of forging processes.
- Design considerations of forged parts.
- Welding.
- Weld ability of metals.
- Types of welding, welded joints, basic types, technical and design considerations process selection, plastic molding, power metallurgy, and some special machining processes.

IE301 Probability and Engineering Statistics I

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): ES102

Contents:

- An introduction to set theory, elements of probability and their applications, definition of random variable and distribution and density functions, discrete and continuous dist. as the binomial, poisson, and normal dist.
- Sampling distribution.
- Computer applications.

IE302 Quality Control

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE301

Contents:

- Concepts of quality control including theory and applications of control charts for variables and attributes, acceptance sapling, and economics of quality control, computer use in quality control.

IE303 Engineering Cost Analysis

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): ES102

Contents:

- Survey of elementary financial and cost concepts, analytical accounting techniques, statement interpretation, and industrial problems.

IE304 Operations Research I

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE204

Contents:

- An introduction to philosophy and methodology of operations research, specific techniques introduced are: linear programming, using simplex and matrix approaches transportation and assignment algorithms and inventory theory.
- Use of computer to solve problems in operations research.

IE306 Human Factors Engineering I	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE204
Contents:	
• Analysis and design of work methods including process and operation charting, and principles of motion economy. • Study of work measurement systems, determination of allowances, rating and time standards. • Use of human factors engineering data in work design.	

IE307 Engineering Economy	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): ES102
Contents:	
• A study of methods for determine the comparative financial desirability engineering alternatives. • Topics include interest, time value of investments, break-even and minimum cost analysis, replacement analysis, and depreciation analysis. The computer use in solving some problems in engineering conomy.	

IE308 Manufacturing Process and Machine Tools	
4 Lecture hours per week (4+8) 12 units	Prerequisite(s): IE208
Contents:	
• Metal cutting and machining: Machining time, metal removal rate, and electrical power consumed in machining operations. Cutting conditions: single-point tool, geometry, nomenclature and material lubrication of cutting tools. Cutting Action: Chip formation and its types, mechanics of metal cutting. • Machine tools: Classification, elements of construction and kinematics design. • Metal forming: Mechanics of metal forming yielding criteria for ductile metals, Metal working processes: Classification of deforming processes. Typical processes.	

IE310 Probability & Engineering Statics II	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE301

Contents:

- Estimation and tests of hypotheses concerning means, variances and proportions, including contingency tables and goodness of fit.
- Simple, multiple regression and correlation.
- Analysis of variance.
- Industrial computer applications.

IE402 Engineering Management	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE306

Contents:

- An introduction to the study of managerial process and problems confronting the engineering manager. Includes organization theory, management functions, communication theory, motivation environmental and social considerations and relationships and responsibilities in designing and implementing managerial systems.

IE404 Advanced Operations Research	
3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE304

Contents:

- Advanced linear programming and applications, theory, applications and algorithms of integer programming, theory and algorithms of non-linear programming.

IE405 Operations Research II

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE301, IE304

Contents:

- Network models, CPM/PERT project scheduling including cost and limited resources considerations.
- Game theory.
- Dynamic programming, queuing theory (infinite and finite queues).
- An introduction to Markov chains and their applications.
- The computer use in solving some problems of queuing theory.

IE406 Reliability Engineering

3 Lecture hours per week (3+6) 9 units	Prerequisite(s): IE310

Contents:

- Fundamental concepts of reliability.
- Reliability function and estimation of reliability of components and systems.
- Design for reliability and reliability testing.
- Measures for maintainability and availability.

IE407 Human Factors Engineering II

3 Lecture hours per week (3+6) 9 units

Contents:

- Outline of important anatomical, physiological, and psychological properties of man that are affecting performance in man/environment systems.
- Human factors considerations in the design of work place, tools, and controls.
- Environmental considerations of illuminations, atmospheric conditions and noise.
- Organizational factors in work design.

IE408 Industrial Psychology	
3 Lecture hours per week (3+6) 9 units	Prerequisite: Fourth year standing
Contents:	

- Function of psychologist in industrial problems.
- Personnel selection, training and promotion methods and technqiues.
- Job analysis, human relations, supervision and leadership, communication and worker participation.
- Worker motivation, morale and attitudes, job performance and its evaluation, human engineering.
- Working conditions.
- Accidents and safety.
- Consumers behavior and market research.

IE409 Production and Inventory Control	
3 Lecture hours per week (3+6) 9 units	Prerequisite: IE301
Contents:	

- Principles, analysis and design of production and inventory planning and control systems.
- Demand forecasting, inventory functions, production planning and control, production scheduling, dispatching, and progress control.
- The computer use in production control.

IE410 Industrial Safety and Health	
3 Lecture hours per week (3+6) 9 units	Prerequisite: fourth year standing
Contents:	

- Nature, causes and sources of accidents, safety performance appraisal and effective safety program.
- Job safety analysis, accident investigation, and safety inspection.
- Safety records and reports.
- Plant layout, housekeeping, maintenance, and handling for safety education and safety practices.

- Personal protective equipment.
- First aid
- Fire prevention.
- Occupational health hazards.

IE Engineering Economy II	
3 Lecture hours per week (3+6) 9 units	Prerequisite: IE307, IE310
Contents:	

- Advanced methods for economic analysis of industrial problems.
- Investment analysis under risk and uncertainty.
- Single and multiple project evaluation and selection criteria.

IE415 Industrial Engineering System Design I	
3 Lecture hours per week (3+6) 9 units	Prerequisite: 1. Can be taken only in the semester proceeding the semester of the student's expected graduation. 2. Courses depending upon the project assigned to student.
Contents:	

- The first part of a 2 part course of a project in one if IE fields.
- Library research and collection and analysis of data for the assigned topic to the student.

IE416 Industrial Engineering System Design II	
6 Lecture hours per week (6+12) 18 units	Prerequisite: IE 415 + courses depending on the student's topic.
Contents:	

- Continuation of IE 415, completion of project work, preparation of final report and presentation of total work of IE 415 and IE 416 with oral examination before an examination committee.

IE417 Human Factors Engineering Laboratory	
3 Lecture hours per week (3+2) 5 units	Prerequisite: IE 306, Co-requisite: IE 407
Contents:	

- Laboratory work and demonstration in design of work methods and work measurements.
- Measures of work activity indexes.
- Measurements of environmental factors.
- Some psychological measurements related to work.