

SUMMARY OF COURSE DESCRIPTIONS

BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING

COURSE DESCRIPTION OF INDUSTRIAL ENGINEERING

A. MATHEMATICS

ALGEBRA (MATH 114) - A course designed to give the student a better view of the essential algebraic techniques and manipulation needed in the study of higher mathematics. Topics covered include: fundamentals operations of Algebra, special products and factoring, fractions ; exponents and radicals ; linear, quadratic and higher degree equations, inequalities, ratio and proportions; the binomial theorems; probability, determinants and partial fractions.

CREDIT UNITS : 4 units

PLANE AND SPHERICAL TRIGONOMETRY (MATH 113) - A course designed to provide the student knowledge in trigonometry in covering such topics as generalized trigonometric functions, fundamental trigonometric identities, logarithms, solutions of right and oblique triangles, application of trigonometric functions, solutions of right and oblique spherical triangles.

CREDITS UNITS : 3 units

PLANE AND SOLID ANALYTIC GEOMETRY (MATH 123) - A course in coordinates systems; equations and their loci; straight lines, conic sections and higher plane curves, transformation of coordinates.

CREDIT UNITS : 3 units

PRE-REQUISITE : Algebra and Trigonometry

SOLID MENSURATION (MATH 122) - A course covering topics as mensuration of area, perimeter and centroid of plane figures; mensuration of the volume and surface area of the solid pyramid, cylinder, cone and sphere.

CREDITS UNITS : 2 units

PER-REQUISTE : Algebra and trigonometry

DIFFERENTIALS CALCULUS (MATH 215) - A course covering the basic concepts and methods of the differential calculus together with its many applications in geometry, physics and other fields . A logical development of fundamental principles is combined with emphasis on the computative and applied aspect which shows the power of the calculus as a tool of an engineer. Topics usually covered: functions, limits/continuity, derivatives, and partial derivatives, applications; indeterminate forms.

CREDITS UNITS : 5 units

PRE-REQUISITE : Analytic Geometry

INTEGRAL CALCULUS (MSTH 225) - A course covering topics formula for integration; definite, geometry and applications of integration procedures; infinite series;

hyperbolic functions; multiple integral applications of multiple integration.

CREDIT UNITS : 5 units
PRE-REQUISITE : Differential Calculus

DIFFERENTIAL EQUATIONS (MATH 313) - A course in ordinary and partial differential equations covering methods of solutions and the basic principles behind these methods with application to simple problems in engineering and engineering sciences.

CREDITS UNITS : 3 units
PRE-REQUISITE : Integral Calculus

PROBABILITY AND STATISTICS (STAT 003) - A study of the traditional descriptive statistics; frequency distributions, measures of central tendency and dispersal; introduction to probability, random variables and their functions; discrete and continuous probability distributions and their applications; index numbers; time series.

CREDITS UNITS : 3 units
PRE-REQUISITE : Integral Calculus

B. PHYSICAL SCIENCES

CHEMISTRY 1 & 2 – Matter and energy; theory and atoms and molecules, chemical periodicity, principles of calculation of chemical changes; chemical bonding; solutions; chemical equilibrium; thermochemistry, electrochemistry, chemicals kinetics; nuclear chemistry.

CREDITS UNITS : Chem 1 Lec: 3 units Lab: 1 unit
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PHYSICS 1 & 2 – Mechanics, waves, sound, heat, electricity, magnetism, light

CREDITS UNITS : Physics 1 Lec: 3 units Lab: 1 unit
Physics 1 Lec: 3 units Lab: 1 unit

C. BASIC ENGINEERING SCIENCES

ENGINEERING DRAWING - Techniques and practices of engineering towards those elements and composites which are relevant to a particular field of engineering design and construction.

CREDITS UNITS : 3 units

COMPUTER FUNDAMENTALS & PROGRAMMING (CS 002) - Introduction to computer system, fundamentals of algorithms, high level language, programming applications.

CREDITS UNITS : 3 units

ENGINEERING MECHANICS (MECH 315) - Statics and dynamics; operations with the free body concepts; equilibrium of coplanar and non-coplanar forces systems; analysis of frames and trusses; friction; centroids and moments of inertia; motion of particles and rigid

bodies; forces, mass and acceleration; work and energy; impulse and momentum.

CREDITS UNITS : 5 units

PER-REQUISITE : Integral Calculus, Physics 1

STRENGTH OF MATERIALS (MECH 325) - Deals with the relations between externally applied forces and their internal effects on bodies. Among the topics covered: are stresses, shear and moments in beams, vertical shear, bending moment, combined axial and flexural loads, thermal stresses.

CREDITS UNITS : 3 units

PER-REQUISITE : Engineering

CIRCUITS 1 (EE 313) – A study of experimental laws and DC simple circuits, techniques of circuit analysis; source transformation, nodal analysis, mesh analysis. Thevenin and Norton's Theorem/Transient circuits; AC circuits.

CREDITS UNITS : 3 units

PER-REQUISITE : Integral Calculus, Physics 2

THERMODYNAMICS (ME 313) – A course dealing with the thermodynamics properties of pure substances, ideal and real gases, and the study and application of the laws of thermodynamics in the analysis of processes and cycles involving pure substances.

CREDITS UNITS : 3 units

PRE-REQUISITE : Integral Calculus, Physics 2

ENGINEERING ECONOMY (IE 414) – Concepts and techniques of analysis for making economic decisions concerning systems, products and services; selections in present economy; basic economy methods; depreciation and valuation; selections among alternatives; interest and money-time relationships; inflation; cost-volume-profit analysis; marginal and risk analysis; capital management and resource allocation.

CREDITS UNITS : 3 units

PRE-REQUISITE : Principles of Economics, Probability & Statistics,
Acctg System 1

ENGINEERING MANAGEMENT (INDUSTRIAL ORGANIZATION & MANAGEMENT) (IE 313) - Principles and concepts of organizations; development of engineering and management skills; introduction of scientific management in the administration of various areas of industrial operations.

CREDITS UNITS : 3 units

PER-REQUISITE : 3rd Year Standing

MATERIAL SCIENCE (IE 333) – Structure and composition of various materials and their alternatives, properties and behavior of materials in the service environment; ferrous and non-ferrous metals and alloys, ceramics, rubber, plastics, organic and composite materials.

CREDITS UNITS : 3 units

PER-REQUISITE : Physics 2, Chemistry

IE LAWS, CONTRACTS & ETHICS (IE 583) – A study of the public and private engineering contracts, preparations and writing specifications, procedures and instruments in bidding and sales of equipment and services. It also includes the study of the proposed IE Laws as well as the code of ethics of engineers.

CREITS UNITS : 3 units
PRE-REQUISITE : 5th Year standing

ENVIRONMENTAL SCIENCE (IE 403) – A study of the earth and its resources and the ecological problems facing the world today.

CREDITS UNITS : 3 units
PRE-REQUISITE : 4th Year standing

ELEMENTARY SURVEYING (CE 312 LEC/FIELD) – A study of the techniques use to locate points on or near earths surface by using surveying instruments like tapes, transits, theodolites, engineer’s levels and the like.

CREDITS UNITS : 2 units
PRE-REQUISITE : Physics 2

D. PROFESSIONAL COURSES

INDUSTRIAL PROCESSES (IE 322 LEC/ALB) – A study of industrial processes and equipment related to materials and product use. The laboratory works include woodworking, sand and metal molding, heat treatment, machining and finishing; machine shop practice and foundry .

CREDITS UNITS : 3 units
PRE-REQUISITE : Material Science

METHODS ENGINEERING (IE 415 LEC/LAB) – Methods study and work measurement used in the examination of human work; investigation of all factors affecting the efficiency; economy and productivity of a situation and/or industry being reviewed in order to effect improvement.

CREDITS UNITS : 5 units
PER-REQUISITE : Probability and Statistics

ADVANCED STATISTICS (MATH 343) – Sampling theory; estimation and hypothesis testing; linear regression and correlation, multiple linear regression, polynomial regression; analysis of variance; non-parametric tests; design of experiments.

CREDITS UNITS : 3 units
PRE-REQUISITE : Probability and Statistics

OPERATIONS RESEARCH 1 (IE 413) – Introduction to operations research and its methodology; linear programming formulations, solution techniques in linear programming, duality, sensitivity analysis; transportation and assignment models.

CREDITS UNITS : 3 units
PRE-REQUISITE : Advanced Statistics, Advanced Eng’g Math

OPERATIONS RESEARCH 2 (IE 423) – Integer programming; network analysis; decision theory; dynamic programming; queueing theory; markov analysis; simulation and non-linear programming.

CREDITS UNITS : 3 units
PRE-REQUISITE : Operations Research 1

STATISTICAL QUALITY CONTROL (IE 463) – Introduction to philosophies on quality and productivity; statistical process control; acceptance sampling and reliability theory.

CREDITS UNITS : 3 units
PRE-REQUISITE : Advanced Statistics, Methods Engineering

PROJECT FEASIBILITY STUDY (IE 512 LEC/LAB) – Aspect and categories of pre-investment studies; phases of project feasibility studies; project development, evaluation management; tax schemes and entrepreneurship.

CREDITS UNITS : 4 units
PRE-REQUISITE : Production Planning & Control
Acctg System 2

HUMAN FACTORS ENGINEERING (IE 443) – Survey of human factors in engineering with particular reference to human functions in human-machine systems, and consideration of human abilities and limitations and relation to design of equipment and work environments.

CREDITS UNITS : 3 units
PRE-REQUISITE : Methods Engineering

SYSTEM ENGINEERING (IE 543) – A study of system theory; system analysis and design with case studies.

CREDITS UNITS : 3 units
PER-REQUISITE : Production Planning & Control
5th Year standing

PRODUCTION PLANNING AND CONTROL (IE 513) – A study of production in the pre-planning, planning and control stage as well as forecasting techniques, inventory management and control, materials management, capacity planning, scheduling, manufacturing strategy and technology.

CREDITS UNITS : 3 units
PRE-REQUISITE : Operations Research 2

FACILITIES PLANNING AND DESIGN (IE 523) – A study of materials flow, location and layout of facilities; manufacturing process design; materials handling; production and assembly; receiving storage and distribution; auxiliary activities; safety.

CREDITS UNITS : 3 units
PRE-REQUISITE : Production Planning & Control

OCCUPATIONAL SAFETY AND HEALTH (IE 533) – Application of human factors and engineering practice in accident prevention and reduction of health hazards in the work environment; effects and contro

l of physical hazards of noise, vibration and heat stress; survey of disease- producing agents in air, water and soil; hazard measurement.

CREDITS UNITS : 3 units

PRE-REQUISITE : Human Factors Engineering

INFORMATION SYSTEM (IE 563) – Concepts and frameworks of information systems; analysis and design of information systems.

CREDITS UNITS : 3 units

PRE-REQUISITE : Computer fund. & Prog.
Systems Engineering