

SUMMARY OF COURSE DESCRIPTIONS

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

COURSE DESCRIPTION OF ELECTRICAL ENGINEERING

A. MATHEMATICS

ALGEBRA (MATH 115) - Set theory; real numbers; algebraic expressions and operations; equations and inequalities; functions, relations and their graphs; exponential and logarithmic functions; systems of equations; combinatorial mathematics; matrices and determinants; progression; binomial theorem; mathematics induction.

CREDIT UNITS : 3 units

TRIGONOMETRY (MATH 113) - Trigonometric functions; identities and equations; solutions of triangles; law of sines; law of cosines; complex number; inverse trigonometric functions.

CREDIT UNITS : 3 units

PLANE AND SOLID ANALYTIC GEOMETRY (MATH 123) - Coordinate systems; equations and their loci; straight lines, conic sections and higher plane curves; transformation of coordinates, spherical trigonometry; transformation of coordinates in space; quadric surface.

CREDIT UNITS : 3 units

PRE-REQUISITE : Algebra; Trigonometry

SOLID MENSURATION (MATH 122) - Mensuration of the area, perimeter and centroid of plane figures, mensuration of the volume, surface area and center of gravity of solids, proofs and applications of cavalieri's theorem, pappus theorem and the prismoidal theorem.

CREDIT UNITS : 2 units

DIFFERENTIAL CALCULUS (MATH 215) - Functions; limit and continuity; derivatives and differentiation; partial derivatives; applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : Analytic and Solid Geometry; Solid Mensuration

INTEGRAL CALCULUS (MATH 313) - Anti-derivatives, integration methods; definite integrals; multiple integrals; applications; infinite series.

CREDIT UNITS : 3 units

DIFFERENTIAL EQUATIONS (MATH 321) - A course in ordinary and partial differential equations covering methods of solutions and the basic principles behind these methods with applications to simple problems in engineering or physical sciences.

CREDIT UNITS : 3 units

PRE-REQUISITE : Integral Calculus

PROBABILITY AND STATISTICS (STAT 003) - Basic principles of statistics, charts, graphs, presentation and analysis of data averages, median mode, deviations, probability, normal curves and applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : 4th year standing

ADVANCED ENGINEERING MATHEMATICS (MATH 322) - Determinants and matrices; power series expansion; complex frequency; state variable analysis; fourier series; fourier transform, laplace transform.

CREDIT UNITS : 3 units

PRE-REQUISITE : Integral Calculus

B. PHYSICAL SCIENCES

CHEMISTRY 1 (CHEM 113) - Basic concepts of matter and energy; atomic structure and periodic classification of elements, chemical bonding, atomic and molecular masses, chemical equation, water and hydrogen peroxide and important discussion on gaseous, solid and liquid state of matter.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

CHEMISTRY 2 (CHEM 123) - Deals with reduction oxidation reaction properties of solution and method by which concentrations are expressed. Chemical equilibrium is also studied together with the factors which affect reaction rates, ionization and pH determination.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Chemistry 1

PHYSICS 1 (PHYS 213) - Mechanics; work and energy; waves; sound; heat.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Analytic and Solid Geometry; Solid Mensuration

PHYSICS 2 (PHYS 223) - Electricity and magnetism; light and optics; quantum mechanics

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Physics 1 Lec/Lab

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.

CREDIT UNITS : 3 units

ENGINEERING MECHANICS (GE 315) - Statics and dynamics; operations with the free body concept; equilibrium of co planar and non-co planar force systems; analysis of frames and trusses; friction, centroids and moments of inertia, motion of particles and rigid bodies; force, mass and acceleration; work and energy; impulse and momentum.

CREDIT UNITS : 5 units

PRE-REQUISITE : Integral Calculus; Physics 1

STRENGTH OF MATERIALS (GE 323) - Axial stress and strain; stresses for torsion and bending, combined stresses; beam deflections; determinate and indeterminate beams, elastic instability.

CREDIT UNITS : 3 units

PRE-REQUISITE : Engineering Mechanics

THERMODYNAMICS (ME 313) - Laws of thermodynamics, energy and property relationships; ideal gas laws, thermodynamics processes and cycles heat transfer basics.

CREDIT UNITS : 3 units

PRE-REQUISITE : Physics 1; Integral Calculus

ENGINEERING MATERIALS (EE 325) - Physics of materials, properties of engineering materials (polymers, ceramics, glasses, semiconductors) including mechanical acoustic, electrical, amgnetic, chemical optical and thermal properties.

CREDIT UNITS : 2 units

PRE-REQUISITE : Integral Calculus; Gen. & Inorganic Chem, 2

ENGINEERING ECONOMY (EEco 003) - Time, value of money, economic decision-problems and criteria, and financial mathematics.

CREDIT UNITS : 3 units

PRE-REQUISITE : Regular 4th year

ENGINEERING MANAGEMENT (EE 424) - Industrial organization and management concepts, theories, principles, functions and practices, human behavior, introduction to decision-making tools, PERT-CPM, case studies.

CREDIT UNITS : 3 units

PRE-REQUISITE : 4th year standing

FLUID MECHANICS (GE 324) - Properties of fluids and hydrostatics pressure, basic principles of kinematics of fluid mechanics, relative equilibrium of liquids, flow through orifices, tubes, and wires.

CREDIT UNITS : 3 units

PRE-REQUISITE : 4th year standing

ENVIRONMENTAL SCIENCE AND MANAGEMENT (EM 300) - Principles of ecology (hydrosphere, atmosphere, lithosphere, biosphere), sustainable concepts, global environmental issues, water and waste water management, air pollution, solid waste management, waste minimization, thermal pollution, noise pollution, case studies.

CREDIT UNITS : 3 units

PRE-REQUISITE : 3rd year standing

C. PROFESSIONAL COURSES

ELECTRICAL CIRCUITS 1 LEC (EE 311) - Fundamental relationships in circuit theory; mesh and node equations; resistive network theorems, solution of network problems using laplace transform; transient analysis, methods of circuit analysis.

CREDIT UNITS : 3 units

PRE-REQUISITE : Physics 2; Integral Calculus

ELECTRICAL CIRCUITS 1 LAB (EE 311L) - A laboratory course to accompany EE 311.

CREDIT UNITS : 1 unit

ELECTRICAL CIRCUITS 2 LEC (EE 321) - Complex algebra and phasors; simple AC circuits, impedance and admittance, mesh and node analysis for AC circuits; AC network theorems; power in AC circuits, personance; two port network parameters and transfer function.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electrical Circuits 1

ELECTRICAL CIRCUITS 2 LAB (EE 321L) - A laboratory course to accompany EE 321.

CREDIT UNITS : 1 unit

ELECTRONICS 1 LEC (ECE 301) - Elementary semi-conductor theory; diode, and transistor models; diode circuit analysis and applications; transistor biasing, small signal analysis, large sigsignal analysis, differential amplifiers, transistor amplifiers, transistor switch.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electrical Circuits 1; Electro Magnetics

ELECTRONICS 1 LAB (ECE 301L) - A laboratory course to accompany ECE 301.

CREDIT UNITS : 1 unit

ELECTRONICS 2 LEC (ECE 401) - High frequency transistors models, analysis of transistor models, feedback and operational amplifiers; combinational and sequential devices for logic circuits, integrated circuit families.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electronics 1

ELECTRONICS 2 LAB (ECE 401L) - A laboratory course to accompany ECE 401.

CREDIT UNIT : 1 unit

ELECTROMAGNETICS (EE 312) - Vector analysis, steady electric and magnetic fields, dielectric and magnetic materials; time varying fields, field and circuit analysis.

CREDIT UNITS : 3 units

CO-REQUISITE : Electrical Circuits 1

ENERGY CONVERSION LEC (EE 414) - Principles of electromechanical energy conversions; motors, generators, transformers, characteristics of motors / generators, dynamic analysis.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electrical Circuits 2

ENERGY CONVERSION LAB (EE 414L) - A laboratory course to accompany EE 414.

CREDIT UNITS : 1 unit

PRINCIPLES OF COMMUNICATIONS (ECE 422) - Communication circuits; signals and spectra; noise and distortion; methods of modulation, reception and detection, introduction to information theory.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electronics 2; Electrical Circuits 2

CONTROL SYSTEMS (EE 423) - Transfer functions, block diagrams, signal flow graphs, root locus, bode, nyquist an dplots, sensitivity and stability criteria, linear feedback systems, PLC.

CREDIT UNITS : 3 units

PRE-REQUISITE : Energy Conversion

EE LAWS, CONTRACTS AND ETHICS (EE 523) - Contracts, warranties; liabilities, patents, bids, insurance, logal and ethical positions of the professional engineer.

CREDIT UNITS : 2 units

PRE-REQUISITE : 5th year standing

SEMINARS AND FIELD TRIPS (EE 525) - Seminars and lectures on current topics on electrical engineering developments; field trips to different companies and plants (i.e. substations, thermal and hydro plants, communication / transportation companies).

CREDIT UNITS : 1 unit

PRE-REQUISITE : 5th year standing

INDUSTRIAL ELECTRONICS LEC (EE 511) - Theory and operating characteristics of electronic devices and cotrol circuits for industrial processes; industrial control applications of DC machines, power electronics.

CREDIT UNITS : 3 units

PRE-REQUISITE : Energy Conversion; Electronics 2

INDUSTRIAL ELECTRONICS LAB (EE 511L) - A laboratory course to accompany EE 511.

CREDIT UNITS : 1 unit

ELECTRICAL MACHINERY LEC (EE 421) - Engineering aspects and applications of transformers, induction motors, synchronous generators and motors.

CREDIT UNITS : 3 units

PRE-REQUISITE : Energy Conversion

ELECTRICAL MACHINERY LAB (EE 421L) - A laboratory course to accompany EE 421.

CREDIT UNITS : 1 unit

COMPUTER SYSTEMS (COMP 421) - Number systems, logic circuits, counters, adders, design of up / down counters, boolean algebra, analysis of TTL, RTL, DTL Family, karnaugh map.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electronics 2

INSTRUMENTATION AND MEASUREMENT (EE 518) - Detectors for the measurement of process variables, analysis and synthesis of performance characteristics of control system, electronic, magnetic, hydraulic and mechanical control devices.

CREDIT UNITS : 3 units

POWER SYSTEM (EE 517) - Essential features of power transmission and distribution, transmission line design, analysis of power networks, load flow analysis, computer methods.

CREDIT UNITS : 3 units

PRE-REQUISITE : Energy Conversion

COMPUTER FUNDAMENTALS & PROGRAMMING (CS 002) - An introduction to the use of computers in engineering, algorithms and flow charting and introductory programming using BASIC.

CREDIT UNITS : 3 units

PRE-REQUISITE : 2nd year standing

COMPUTER FUNDAMENTALS 2 (CS 003) - Introduction to computer systems, fundamentals of algorithms, high level language, programming applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : 3rd year standing

COMPUTER FUNDAMENTALS 3 (CS 004) - Continuation of computer fundamentals and programming 2.

CREDIT UNITS : 2 units

PRE-REQUISITE : Computer Fundamentals 2

ELECTRICAL SYSTEM DESIGN 1 LEC (EE 420) - Philippine electrical code, residential building, wiring, illumination design, cost estimating, commercial and industrial load.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electrical Circuits 3; Electrical Shop Practice

ELECTRICAL SYSTEM DESIGN 1 LAB (EE 420L) - Deals with the preparation of the power and lighting design of single and multifamily dwelling. Covers the basic of the Philippine Electrical Code and the interpretation of the provisions of the code as applied to actual

electrical works. Higher level design preparation for the electrical system of commercial and industrial establishment.

CREDIT UNITS : 1 unit

ELECTRICAL SYSTEM DESIGN 2 LEC (EE 522) - Different power plant operation; load computation; load curve; design of a power plant electrical system, capacity, demand factors, utilization factors, determination of rating of auxiliaries that goes with the operation of a power plant.

CREDIT UNITS : 3 units

PRE-REQUISITE : Power System; Electrical Machine Design;
Electrical Equipment & Devices

ELECTRICAL SYSTEM DESIGN 2 LAB (EE 522L) - A comprehensive study on power plant factors and design to accompany electrical system design 2 lec.

CREDIT UNITS : 1 unit

E. TECHNICAL ELECTIVES

ELECTRICAL SHOP PRACTICE LAB (EE 323L) - This course deals with different methods of installation of electrical works, conduit works, protecting devices and all electrical devices. The course will involve practical aspects of tool handling, testing or wiring and latest installation techniques, rewinding of equipment such as motors and repairing of electrical devices.

CREDIT UNITS : 1 unit

PRE-REQUISITE : Electrical Circuits 1

ELECTRICAL CIRCUITS 3 (EE 413) - A vivid discussion on polyphase systems. Includes the generation of polyphase voltage, vector addition, phase sequence, interconnection of three phases and phase sequence at load. Deals also on star or wye connection, delta or mesh connection, includes analysis on balanced A/Y and Y/A conversion, power measurement in

3Ø. Covers unbalanced load, four-wire star connected unbalanced load. Detailed discussion of solution by KCL and by Millman's. Transients in RL-RC of both DC and AC Circuits.

CREDIT UNITS : 2 units

PRE-REQUISITE : Electrical Circuits 2

NUCLEAR POWER ENGINEERING (ME 518) - A study of the principles of nuclear physics and radiation, discussion on the reactor theory, control, and instrumentation. Also economics and applications of nuclear power to electricity generation.

CREDIT UNITS : 2 units

ELECTRICAL EQUIPMENT AND DEVICES (EE 425) - Principles, characteristics, performance and application of switch gears, controllers, instrument transformers and other selected equipment and devices currently used in the field to a specific requirement of an electrical system.

CREDIT UNITS : 3 units

PRE-REQUISITE : Electrical Machinery

ELECTRICAL MACHINE DESIGN (EE 513) - Design of rotating electrical machines and transformers including their characteristics and performance as specified under assumed conditions, with emphasis on the detailed analysis of design data for the predetermination of their operating characteristics and efficiencies.

CREDIT UNITS : 1 unit

PRE-REQUISITE : Energy Conversion; Electrical Machinery

MICROPROCESSORS (EE 516) - Survey of microprocessor organizations, microcomputer architecture, interfacing, bus standards, microcomputer development systems and other tools for design.

CREDIT UNITS : 3 units

PRE-REQUISITE : 5th year standing

PROJECT FEASIBILITY STUDY LEC (EE 520) - A study dealing with basic element on project studies which include project ideas and literature, scheduling (PERT/CPM), cost planning, reports, and presentation.

CREDIT UNITS : 3 units

PRE-REQUISITE : 5th year level

PROJECT FEASIBILITY STUDY LAB (EE 520L) - Actualization of data gathering, random sampling, preparation of actual report, defense.

CREDIT UNITS : 1 unit

SAFETY ENGINEERING (EE 530) - Principles and practice of industrial safety and accident prevention.

CREDIT UNITS : 1 unit

PRE-REQUISITE : Regular 5th year

COMPUTER AIDED CIRCUIT ANALYSIS & DESIGN LEC (CAD 001) - Network equation formulation, numerical techniques, for AC, DC and transient solutions for linear and non linear network, sensitivities and automated design, device models and practical design problems.

CREDIT UNITS : 3 units

PRE-REQUISITE : 5th year standing

COMPUTER AIDED CIRCUIT ANALYSIS & DESIGN LAB (CAD 001L) - A hands on laboratory to accompany CAD 001.

CREDIT UNITS : 1 unit