

1st Year Odd Semester

ETE 101: Introduction to Solid State Devices

Credits: 3.00 Contact Hours: 3 Hours/Week

Theory of Semiconductor: Electronic structure of elements, energy band diagram of conductor, insulator and semiconductor, covalent bonding in semiconductors, intrinsic and extrinsic semiconductor, effects of temperature on extrinsic semiconductors.

Semiconductor Diodes: The P-N junction, biasing conditions, V-I characteristics, effects of temperature on diode characteristics, half wave and full wave rectification with filtering, zener diode, tunnel diode, varactor diode.

Bipolar Junction Transistor (BJT): PNP and NPN transistors, principles of operation, biasing and thermal stability, characteristics in different configurations, transistor switching time.

Field Effect Transistor (FET): Construction of JFET and MOSFET, characteristics and principles of operation, FET biasing, introduction to CMOS and its application.

Industrial Semiconductor Device: Structure and basic operation of SCR, UJT, DIAC, TRIAC, photo diodes, phototransistor, solar cells, LED and LCD.

ETE 102: Sessional Based on ETE 101

Credit: 0.75 Contact Hours: 3/2 Hours/Week

Laboratory based on Solid State Device (ETE 101)

EEE 107: Electrical Circuit Theory

Credits: 3 Contact Hours: 3 Hours/Week

Electrical units and Standards. Electrical power sources. Electrical circuit elements and models. RMS and average value, form factor and peak factor of sinusoidal waveforms. Introduction to phasor algebra. DC & Steady state AC circuit solutions: Series, Parallel, Series-Parallel networks. Loop and Nodal methods, Delta-Wye transformations. Electrical resonance of series and parallel circuits.

Circuit theorems and their application to circuit solution. Introduction to threephase balanced and unbalanced circuits.

Magnetic Circuit and concepts: flux, fields, permeability, reluctance, analysis of magnetic circuits.

EEE 108: Sessional Based on EEE 107

Credit: 1.50 Contact Hours: 3 Hours/Week

Laboratory based on Electrical Circuit Theory (EEE-107)

ETE 190: Engineering Graphics

Credit: 1.50 Contact Hours: 3 Hours/Week

Drawing equipment and the use of instruments, Basic drafting techniques and standards, Sectional and isometric views of solid geometric figures, Interpenetrating of surfaces, Development of surfaces, Freehand sketch of machine and engine components, Introduction to computer-aided drawing.

Phy 111: Physics

Credits: 3.00 Contact Hours: 3 Hours/Week

Atomic Structure: Thompsons, Rutherford and Bhor's atomic model. Atomic arrangement in solid. Different types of bonds in solid-metallic, Vander Walls and ionic bond.

Electronic Structure of Materials: Free electron theory, Metallic conduction. Energy bands, Brillouin zones, Temperature dependence of metallic conductivity. Semiconductors: Band theory, intrinsic and extrinsic semiconductors, Fermi levels, mobility and electrical conductivity, carrier diffusion and life time. Magnetic materials: Properties, Dia-, Para- and Ferromagnetism. Hysteresis loop, B-H curve, Energy losses in magnetic materials and their measurements. Soft and hard magnetic materials, ferrities.

Thermal electricity: thermocouple, Seebeck effect, Peltier and Thompson effect, Thermo-emf.

Photoelectricity: Laws of photoemission and Einstein's equation. Photoelectric cell and its use.

Sound: Simple harmonic motion, wave equation, Principle of superposition. Beats, Dispersion, Phase and group velocities, Doppler's effect, Free and forced vibrations.

Physical Optics: Theories of light; Huygen's principle and construction. Interference of light: Young's double slit experiment, Fresnel bi-prism, Newton's ring, interferometers. Diffraction of light: Fresnel and Fraunhofer diffraction, diffraction by single and double slit diffraction gratings. Polarization, production and analysis of polarized light, optical activity, optics of crystals.

Phy 112: Sessional Based on Phy 111

Credit: 0.75 Contact Hours: 1.50 Hours/Week

Laboratory based on Physics (Phy-111)

Math 151: Engg. Mathematics-I

Credits: 3.00 Contact Hours: 3 Hours/Week

Differential Calculus: Review of differentiation of various types of functions. Rolle's theorem, Mean value theorem. Taylor's and Maclaurin's theorems in finite and infinite forms. Divergency and Convergency of series. Partial differentiation, Euler's theorem. Tangent, normal and curvature. Determination of maximum and minimum values of functions and their application.

Integral Calculus: Review of indefinite and definite integration of various

types of functions. Use of definite integration in summing series. Walli's formulae. Improper integrals. Beta function and Gamma functions. Area under a plane curve and area of a region enclosed by two curves in cartesian and polar coordinates. Volume and surface areas of solids of revolution.

Matrix: Definition of matrix, Different types of matrix, Algebra of matrix, Adjoin and inverse of a matrix, Elementary transformations of matrix, Matrix polynomials, Calay-Hamilton theory with uses of rank and nullity, Normal and canonical forms, Solution of linear equations, Eigenvalues and eigenvectors.

Hum 111: Technical English Communication & Report Writing

Credits: 2.00 Contact Hours: 2 Hours/Week

Construction of sentences. Transformation of sentences. Use of Prepositions, Question words, Phrases and Idioms. Comprehension. Composition of current affairs. Precise writing. Reporting technical information. Commercial correspondence and tenders.