1st Year Odd Semester

ECE 1101 Circuits and Systems-I Credits : 3
DC analysis: Introduction of electrical power sources, ideal and practical sources, linear circuit elements. DC analysis of series, parallel and series-parallel circuits. Kirchhoff's Voltage and current laws, voltage, current, power and energy.
Sinusoidal wave: Average and effective values, form factor, peak factor, phase relation and phasors. Steady state AC analysis of series, parallel and series parallel circuits, phase relation between voltage and current, concept of impedance, power, power factor, phasor diagram.
Network theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, substitution theorem and reciprocity theorem. Frequency response of ac circuits, resonance phenomena. periodic signals in time and frequency domains. Circuit analysis using proper simulation tools.
Magnetic circuit and concepts: flux, fields, permeability reluctance, analysis of series, parallel and series- parallel magnetic circuit.

ECE 1102 Circuits and Systems- I Sessional Credits : 1.5
Sessional based on the theory of course ECE 1101.

ECE 1103 Computer Programming Credits : 3
Introduction to computer programming: Algorithm, Writing, debugging and running programs using C/C++ compiler.
C/C++ Basics: Different Data types and their range, Operator and operands and its precedence, input/output, conditional operators, loops nested structure, error handling, built-in functions.
Functions and Arrays: Writing & calling of User – defined functions, Recursive functions, scope of variables, introduction to one-dimensional arrays, multi-dimensional arrays and array manipulation.
Pointers and Strings: Introduction to pointers, pointers and array, pointers and functions, String I/O, String-based built-in functions, String operations, pointer and string.
Files: Introduction to files in C/C++, opening, closing and updating binary and sequential files.
Advanced topics: Operations on bits, register variable, Pre-processors and graphics in C/C++.

ECE 1104 Computer Programming Sessional Credits : 1.5
Sessional based on the theory of course ECE 1103.

Math 1117 Calculus & Coordinate Geometry Credits : 3
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.

Co-ordinate Geometry: Co-ordinate geometry of three dimension- System of co-ordinates, transformation of co-ordinates, distance between two points, section formula, projection, direction cosines, equations of planes and lines.

Phy 1117 Optics and Modern Physics Credits : 3

Optics: Theories of light: Huygens'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. Waves and Oscillations: Oscillations: Simple Harmonic Motion,. Transverse and Longitudinal nature of waves: Travelling and Standing waves. Intensity of a wave, energy calculation of progressive and Stationary waves. Phase velocity, Group velocity. Sound waves: Velocity of longitude wave in a gaseous medium, Doppler effect. Architectural acoustics: Sabine's formula, requisites of a good auditorium.

Modern Physics: Atom models: Thomson model, Rutherford atom model, Electron orbits, Bohr atom model, Energy levels and spectra, Particle properties of waves: Photoelectric effect, Einstein's photoelectric equation, Laws of photoelectric emission, Compton Effect, Quantum effect: de Broglie waves, Group velocity, phase velocity, Michelson Morley's experiment. Galilean transformation. Spectral theory of relativity. Lorentz Transformation. relative velocity, length contraction, time dilation, relativity of mass. Mass-energy relation.

Phy 1118 Optics and Modern Physics Sessional Credits : 0.75

Sessional based on the theory of course Phy -1117.

Hum 1117 Technical English Credits : 3.00

Grammar: Grammatical principles, modals, phrases & idioms, prefixes & suffixes, sentence structures,wh& yes/no questions, conditional sentences.

Vocabulary: Technical & scientific vocabulary, defining terms.

Spoken English: Introduction to phonetic symbols, dialogue, responding to particular situations, extempore speech. **Reading:** Comprehension of technical & non-technical materials-skimming, scanning, inferring & responding to context.

Technical Writing: Paragraph & composition writing on scientific & other themes, report writing, research paper writing, library references.

Professional communication: Business letter, job application, memos, quotations, tender notice.

Hum 1118 Technical English Sessional Credits : 0.75

Sessional based on the theory of course Hum-1117

ECE 1100 Introduction to Computer Systems Credits : 0.75

Computer Fundamentals: Introduction to computer basics, types and generation of computers; basic organization and functional units.

Hardware: Basic units of computer hardware; Processors; input, output and memory devices; keyboard; mouse; OMR; OCR; MICR; CD-ROM; printers; CRT; LCD; LED; microfilm; floppy.

Software: Types of software; system software: familiarization with various operating systems (Windows, DOS, UNIX, Android, IOS etc.); application software: text processing (MS-WORD, etc); Spread sheet (MS-EXCEL etc).

Computer Ethics: Computers in the workplace; computer crime; rules of communications; privacy; intellectual property; impact on employment; professional responsibility; globalization.