Semester II

CS1201 - INTRODUCTION TO COMPUTING (2-1-0)

Introduction

Introduction to the computer devices such as keyboard, mouse, printers, disk, files, floppies, etc.
Concept of computing, contemporary OSs such as DOS, Windows 95, MAC-OS, UNIX, etc.(Only brief user level description).
Introduction to the e-mail, ftp, rlogin and other network services, world wide web.
Introduction to the typesetting software such as Microsoft office.

Introduction to Programming

Concept of algorithms, Example of Algorithms such as how to add ten numbers, roots of a quadratic equation. Concept of sequentially following up the steps of the algorithm.
Notion of program, programmability and programming languages. Structure of programs, object codes, compilers.
Introduction to the Editing tools such as vi or MS-VC editors.
Concepts of the finite storage, bits, bytes, kilo, mega and gigabytes. Concepts of character representation.
Languages for system programming, study of Basic, Fortran, Pascal, Cobol etc.

CS1202-P – COMPUTER PROGRAMMING LAB (0-0-3)

Concepts of flow charts and decision tables, Examples and practice problems.
Introduction to Digital computers and its components, Introduction to DOS and UNIX operating systems.

Development of computer programs for example

- Roots of quadratic and Cubic equations
- summation of N natural numbers
- Arranging numbers in ascending and descending orders
- Separation of odd and even numbers, etc.

CH1201 ENVIRONMENT AND ECOLOGY (2-1-0)

General

Introduction, components of the environment, environmental degradion.

Ecology

Elements of Ecology; Ecological balance and consequences of change, principles of environmental impacts assessment.

Air Pollution and Control

Atmospheric composition, energy balance, climate, weather, dispersion, sources and effects of pollutants, primary and secondary pollutants, green house effect, depletion of ozone layer, standards and control measures.

Water Pollution and Control

Hydrosphere, natural water, pollutants their origin and effects, river/lake/ground water pollution standards and control

Land Pollution

Lithosphere, pollutants (municipal, industrial, commercial, agricultural, hazardous solid wastes): their origin and effects, collection and disposal of solid waste, recovery and conversion methods.

Noise Pollution

Sources, effects, standards and control

PH1201 ENGINEERING PHYSICS – II (3-1-0)

Vector analysis

Scalar and vector fields, gradient of a scalar field, Divergence and curl of a vector fields, Line integral of a vector field, Gauss-divergence theorem, Stoke's theorem.]

Electromagnetism

Quantization & conservation of charge, Coulomb's law (vectorial form) and superposition principle. Concept of electric field lines, flux of E-field, Gauss' law, Electric Potential energy and potential, Conductors, capacitors and dielectric materials, Magnetic field, Force on a moving charge in a magnetic field, Force on current element, Torque on current loop, Biot-Savart law, Ampere's law, Electromagnetic induction and Faraday's law, Magnetism in materials, Maxwell' s equations, Electromagnetic Waves.

Thermoelectricity

Seebeck effect, law of successive temperatures, law of intermediate metals, peltier effect, Thomson effect, Thermoelectric power, application of thermodynamics on thermocouple.

Modern Physics

Elements of wave properties of particles and particle properties of waves, Nuclear Energy, Lasers-spontaneous and stimulated emission of radiation, Einstein coefficient, Parts of laser, types of lasers and their application.

Solid State Devices

Energy band diagram; covalent bonds; bound and free electrons, holes, electron and hole mobilities, intrinsic and estrinsic semiconductors, Fermi and impurity levels; impurity compensation, charge neutrality equation and semiconductor conductivity, Einstein relation, drift and diffusion current, photo conductivity and Hall effect.

MH1201 - MATHEMATICS - II (3-1-0)

Linear Algebra

Vector spaces-linear independence and dependence of vectors. inner products. linear transformation. Matrices and determinants, Systems of linear equations-consistency and inconsistency Gauss elimination, rank of a matrix, inverse of a matrix. Eigenvalues and eigenvectors of a matrix, diagonalization of a matrix.

Ordinary Differential Equations

Formation of ODE's, definition of order, degree and solutions, ODE's of first order separable variables, homogeneous and non-homogenous equations, exactness and integrating factors, linear equations and Bernoulli equations. General linear ODE's of nth order, solutions of homogenous and nonhomogenous equations, operator method, methods of undermined coefficients and of variation of parameters. Solution of simple simultaneous ode'S.

Laplace Transforms

Laplace Transformation of elementary functions:

Transformation of the derivative and derivatives of the Transform. Shifting properties of Laplace Transform.

Inverse Laplace Transform.

Convolution Theorems

Unit Step function

Application of Laplace Transform to solve Linear Differential Equations.

Periodic functions and their Laplace Transforms.

Numerical Analysis

Backward, central, shift and average operators and relations between them. Newton's forward and backward interpolation, Lagrange interpolation and the error formula for interpolation. Numerical differentiation and integration-Trapezoidal rule and Simpson's one-third rule including error formulas.

ME1201 - ENGINEERING THERMODYNAMICS (3-1-0)

Fundamentals and definitions
System, properties, state, state change, diagram, Dimension and units.

Work mechanism and thermodynamics
Definitions, Displacement work at part of a system boundary, Engine indicator, Displacement work in various quasi static processes, Shaft work , electrical work, Heat , temperature, thermal equilibrium , Zeroth law of thermodynamics, sign convention for heat transfer.

First law of thermodynamics
Statement, application to non cyclic and cyclic process, Energy, mode of energy, pure substances, specific heats, and First law applied to flow processes.

Second law of thermodynamics
Direct and reversed heat engine, Kelvin – plancks and clausius statement of second law andtheir equality, reversible and irreversible process, Carnot cycle, carnot theorem, thermodynamic temperature scale.

Entropy
Definition, calculation through T-ds relation, T-S diagrams, entropy as a measure of irreversibility, Clausius inequality.

Properties of pure substances including steam tables and Mollier diagram.

Psychometrics:
Properties of Ideal gas and ideal gas mixture with a condensable vapour.

Second law analysis of engineering processes, Availability and irreversibility and their application in thermal engineering.

EC1201 - BASIC ELECTRONICS (3-1-0)

Semiconductor Diodes
Introduction, ideal diode, PN semiconductor diode, Diode equivalent circuits, Zener diode,Light diodes.

Bipolar Junction Transitor
Introduction, Transistor construction. Transistor operation, common-base configuration, common emitter and common collector configuration.

Field Effect Transistor
Introduction, construction and characteristics of JFETs, Transfer characteristics. Depletion type MOSFET, Enhancement type MOSFET.

Operational Amplifier
Introduction, Differential and common mode operation, Constant gain multiplier, voltage summing, voltage buffer.

Semiconductor Devices
Introduction of silicon controlled rectifier, GTO, TRIAC, DIAC, injunction transistors, IGBT

Cathode Ray Oscilloscope
Introduction, Cathode ray tube-theory & construction.

Electronic Instruments
Introduction, Electronic voltmeters, Vacuum type voltmeters, Differential amplifiers, DC Voltmeter with direct coupled amplifier, Electronic multimeter.

Transducers
Introduction, classification and types of electrical transducers.

Display Devices and Recorders
Introduction, Digital instruments, Digital Vs Analog instruments, Recorders-Analog recorders, graphic recorders, strip-chart recorders.

Data Acquisition Systems
Introduction, Components and uses.

EC1202-P - BASIC ELECTRONICS LAB (0-0-3)

- Characteristics Curve for common base emmitor & common collector transducers
- Characteristics of field effect transistors
- Verification of properties of operational amplifiers
- Study of CRO
- Study of working of data acquisition system

WP1202-P ENGINEERING GRAPHICS – II (0-0-3)

Basic Concepts

I.S. drawing conventions, line symbols, kinds of line, drawing sheet lay-out rules of printing, preferred scales.

Projections

Perspective orthographic, isometric and oblique projections, isometric scale, isometric drawing. Technical sketching.

Shape Description (External)

Multiplanar representation in first and third angle systems of projections, glass box concept, sketching of orthographic views from pictorial views, precedence of lines.

Sketching of pictorial (isometric and oblique) views from Multiplanar orthographic views. Reading exercise, Missing line and missing view exercises.

Shape Description (Internal)

Importance of sectioning, principles of sectioning, types of sections, cutting plane representation, section lines, conventional practices.

Size Description

Dimensioning, tools of dimensioning, Size and location dimensions. Principles and conventions of dimensioning. Dimensioning exercises.

Computer Aided Drafting

Basic concepts and use.