SYLLASBUS-PHYSICS

Mechanics: Vectors, vector triple product, gradient, divergence and curl, Gauss's, Stoke's theorems. Rotational motion, torque, angular momentum, moment of inertia, theorems of perpendicular and parallel axes, moment of inertia of regular shaped bodies. Gravitation, Kepler's laws of planetary motion. Elasticity, surface tension, excess pressure inside soap bubble, capillarity, viscosity, Bernoulli's theorem and its applications.

Simple harmonic motion, free and damped oscillations, wave equation, beats, resonance, Doppler's effect.

Heat and Thermodynamics: Zeroth law of thermodynamics, temperature scales, first law of thermodynamics, reversible, irreversible processes, isothermal, adiabatic processes, second law of thermodynamics, Carnot cycle.

Electricity and Magnetism: Coulomb's law, electric field and potential, Gauss's law and its applications, capacitor, parallel and series combination, energy stored in electric field.

Current electricity, thermoelectric effect, Seebeck, Peltier and Thomson effects, Growth and decay of current in L-R, C-R and LCR circuits.

Alternating current, peak, average and rms values of current, AC through R, C and L circuits, AC through RC, RL and LCR circuits, phasor diagrams, LC oscillations, power in AC circuits.

Magnetic field due to circular loop, Biot-Savart law, Ampere's law, solenoid, magnetic susceptibility, magnetization, dia-, para- and ferromagnetism. Hyteresis, electromagnetic induction, Faraday's and Lenz's law, self and mutual induction, Ac and DC generators, transformers.

Optics: Mirrors and Lenses, Magnifying power, simple and compound microscope, telescope, coherent and incoherent sources, Young's double slit experiment, diffraction by single slit, grating, polarization.

Modern Physics: Spectra of hydrogen atom, Bohr's atom, x-rays, continuous and characteristics x-rays, Mosley's law, matter waves, experimental verification of de Broglie waves, uncertainty principle, constituents of nuclei, nuclear size, mass defect, binding energy, radioactivity, radioactive decay, mean and half life.

Electronics: Semiconductor, p-n junction diode and its I-V characteristics, rectifier, zener diode and its applications, transistor, transistors as amplifiers.