Syllabus:-

Engineering Mathematics, Chemical periodicity, Structure and bonding in homo- and heteronuclear molecules, including shapes of molecules (VSEPR Theory). Concepts of acids and bases, Hard-Soft acid base concept, Non-aqueous solvents, Main group elements and their compounds: Allotropy, synthesis, structure and bonding, industrial importance of the compounds. Inner transition elements: spectral and magnetic properties, redox chemistry, analytical applications, Analytical chemistry- separation, spectroscopic, electro- and thermo analytical methods, Bioinorganic chemistry: photosystems, porphyrins, metalloenzymes, oxygen transport, electron- transfer reactions; nitrogen fixation, metal complexes in medicine, Characterisation of inorganic compounds by IR, Raman, UV-vis, NQR, MS, electron spectroscopy and microscopic techniques, Nuclear chemistry: nuclear reactions, fission and fusion, radio-analytical techniques and activation analysis, Basic principles of quantum mechanics, Atomic structure and spectroscopy, Molecular spectroscopy, Chemical thermodynamics, Electrochemistry, Chemical kinetics, Solid state, Molecules and their Interaction Relevant to Biology, Fundamental Processes, Applied Biology, Mathematical Methods of Physics, Classical Mechanics, Electromagnetic Theory, Quantum Mechanics, Thermodynamic and Statistical Physics, Electronics and Experimental Methods, Nuclear Physics,

Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations; P-N junction, Zener diode, photo diode and solar cell; Electromagnetics, Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; bending and shear stresses; testing of materials with universal testing machine; testing of hardness and impact strength, Fluid Mechanics: Fluid properties; fluid statics, manometer, buoyancy, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy, Heat-Transfer: Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, radiative heat transfer, Stefan-Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis.