

Engineering Chemistry Credits: 4

Unit – I: Elimination reactions; Addition and substitution reactions; Bio-organic reactions; Polymerization; Mechanism of catalytic reactions. Microwave or rotational spectroscopy, Applications of microwave spectroscopy-Infrared spectroscopy, Applications of IR spectroscopy- UV-visible spectroscopy- Spectral problems based on IR and UV.

Unit – II: Electrochemistry: Types of electrodes- Types of cells- Applications of emf measurements-Thermodynamic data-Activity coefficients- Solubility product- pH-Corrosion, Prevention of corrosion.

Unit – III: Kinetics of Chemical reaction: Complex reactions – reversible reactions; Consecutive reactions; Parallel reactions; Steady state approximations; Chain reactions; Kinetics of photochemical reactions.

Unit – IV: Thermodynamics: Concept of entropy; Chemical potential; Equilibrium conditions for closed systems; Phase and reaction equilibrium;

Unit – V: Maxwell relations; Real gases and real solutions. Coordination Compounds and Role of Metals and Inorganic Pollutants on Biological Systems: Nature of metal-ligand bonding in complex molecules;

Unit – VI: Coordination chemistry of complexes; Applications of coordination complexes; Bio-inorganic chemistry; Environmental aspects.

Text Books:

1. Engineering Chemistry by R.P. Mani, K.N. Mishra, B. Rama Devi /CENGAGE learning.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).

Reference Books:

1. Atkin's Physical Chemistry by PW Atkins and I de Paula, 8th and 9th Eds., Oxford University Press.
2. Organic Chemistry by J Clayden, N Greeves and S Warren, 2nd Edition 2012, Oxford University Press.
3. Shriver and Atkin's Inorganic Chemistry by P Atkins, T Overton I Rourke, M Weller and F Armstrong, 4th Edition 2009, Oxford University Press.