## CH1501 Engineering Chemistry L-T-P- 3-0-0 Cr: 03

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| **Unit – 1** | **Chemical and Metallic Bonding:** | **7 Lectures** |
|  | Structure & Bonding: Ionic, Covalent, Coordinate Bonding. Hydrogen bonding, van der Waals forces. VB Theory, Hybridization and shape of molecule, Metallic bonding and structures, Limiting radius ratio rule, Ionic compounds: AX, AX2 types, Theory of metallic bond.  |  |
| **Unit - 2** | **Chemical Thermodynamics:** | **8 Lectures** |
|  | Concept of 2nd Law of Thermodynamics, reversible processes and Carnot cycle. Concept of entropy, entropy changes in reversible and irreversible processes, Clausius inequality. Free energy, Helmholtz and Gibbs free energy, maximum work, spontaneity and equilibrium.  |  |
| **Unit - 3** | **Electrochemistry & Corrosion of metals and its Prevention:** | **8 Lectures** |
|  | Conductivity – Specific, molar and equivalent conductivity, Electrode potential, Galvanic cell, Nernst equation, hydrogen, calomel and glass electrode. Galvanic series, law of Dry corrosion (Parabolic, Linear, Logarithmic law). Wet Corrosion, Type of Corrosion (Pitting, Intergranular, Crevice Corrosion, Waterline Corrosion). Protective measures against corrosion by (i) modification of environment (ii) modification of metals (iii) Use of Protective Coatings (iv) Cathodic Protection. |  |
| **Unit - 4** | **Polymer:** | **7 Lectures** |
|  | Polymers and their classifications, Types of Polymerisation, Determination of Molecular wt. of Polymer. Preparation, properties, and application of important polymers. Biopolymers, Conducting polymers, and application in electronics. |  |
| **Unit - 5** | **Ceramic and Refractory:** | **7 Lectures** |
|  | Material use in Ceramics, Classification and properties of ceramics. Refractories, properties and classification of refractories, measurement of refractoriness, application of refractories, composition of glass and cement, Setting of cement. |  |
| **Unit - 6** | **Fundamentals of Spectroscopy:** | **5 Lectures** |
|  | Basic concept of spectroscopy, UV-Visible and IR spectroscopy, Selection rule, Determination of molecular structure. |  |

**Texts:**

1. Chawla, S. *A Textbook of Engineering Chemistry*, Dhanpati Rai Pubishing.
2. Jain, P. C., Jain, M. *Engineering Chemistry*, Dhanpati Rai Pubishing.
3. *Engineering Chemistry: A Textbook of Chemistry for Engineers*, Edited and published by Wiley-India.