

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4 Chemical Engineering

Subject Code 140501

Subject Name Physical And Inorganic Chemistry

Sr.No	Course contents
1	Phase Rule: Introduction Phase(p) etc. one, two component system, Eutectic system.
2	Electron Displacement : Introduction, Reactive intermediate, Electron displacement effect, inductive effect, Resonance, steric effect, hyper conjugation.
3	Thermochemistry : Energy, Nature of Energy, Energy change in Reactions, Calorimetry, Heat of Solution & Dilution, Effect of Temp. & Pr. On chemical reaction with change in enthalpy, entropy and free energy. Industrial application in details.
4	Electrochemistry : Introduction, Electrochemical Cell, All kinds of Cell, Electrochemical Series & its application, EMF, Acid-Base, pH & pOH and its relation, Buffer solution, Application of pH in controlling of Reaction, Batteries, Fuel Cells
	Instrumental Method of Analysis : Introduction, Chromatography, GC, HPLC, Adsorption Spectroscopy, Lambert, Beer's law & its derivation, Spectroscopy, Calorimetric Analysis, UV Spectroscopy, Infrared, Thermal Methods of Analysis, Thermogravimetric Analysis, Examples, Conductometric Analysis, Potentiometric Analysis, Applications Metals & Alloys : Introduction, Physical Properties of Metals, Metallurgy: Cast Iron, Wrought Iron, Steel; Heat Treatment of Steel, Nickel, Chromium, Vanadium, Tungsten alloys, Steel alloys; Applications, Non Ferrous Alloys, Chemistry of Non Transitional Elements, Transition Metal and Co-ordination Compound, Theories, Isomerism, Applications
5	Metals & Alloys : Introduction, Physical Properties of Metals, Metallurgy: Cast Iron, Wrought Iron, Steel; Heat Treatment of Steel, Nickel, Chromium, Vanadium, Tungsten alloys, Steel alloys; Applications, Non Ferrous Alloys, Chemistry of Non Transitional Elements, Transition Metal and Co-ordination Compound, Theories, Isomerism, Applications
6	Chemical Bonding : Introduction, Nature of Bonding, Ionic, Co-valent, Co-ordinate, Hydrogen, Metallic bonds and their properties, Theories of Bonding (MO., VB. etc), Dipole Moment, Delocalized π O Theories, Intermolecular Force, Crystal Structure Solid-Liquid, Kinetic Theories, Phase Change, Liquid Crystals

7	Explosives & Propellants : Explosives, Classifications, Precautions during the storage of Explosives, Manufacturing of Important Explosives, Rocket Propellants, Classification of Propellants
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Reference Books:

1. Physical chemistry – Semul Glastene
2. Inorganic Chemistry, by Cotton & Wilkinson
3. Physical chemistry – P.L.Soni & Dharma
4. Physical Chemistry – Bahal & Tulli
5. Physical Chemistry –Atkin, 8th Edition, 2008
6. Chemistry -Raymond Chang