11-BS104 ENGINEERING CHEMESTRY

SYLLABUS

Electrochemical energy systems: Basics, electrode potential, emf of a cell, reference electrodes (calomel, glass), determination of pH. Concentration cell. **Conversion and storage** of electrochemical energy: Zn-C dry cell, lead acid, nickel-cadmium, Lithium cells. Chemistry of H_2, H_2-O_2 fuel cell, future water powered car and solar cell. **Corrosion Science:** Definition, atmospheric corrosion-mechanism, electrochemical corrosion-mechanism, microscopic galvanic cell corrosion, concentration galvanic cells, galvanic cells created by differences in composition, structure and stress, factors affecting corrosion, Corrosion control-material selection, design, alteration of environment, cathodic and anodic protection, Electroplating of Cu. **Water Technology:** Sources, impurities, hardness, types of hardness, estimation of hardness by EDTA, alkalinity – numericals, ill effects of water in steam generation, preventive measures - internal and external treatments (cold and hot lime soda processes, numericals and ion exchange process), Quality standards and treatment for drinking water desalination methods: Electrodialysis and reverse osmosis. **Polymers:** Polymers – definition - polymerisation – types - addition and condensation polymerization-free radical and coordination polymerisation mechanisms – plastics, classification – preparation, properties and uses of PVC, Teflon, Bakelite, UF resin and PET. Chemistry and applications of conducting polymers (poly acetylene and poly aniline), FRP composites and abrasives – classification, properties and uses. **Phase Rule**: Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic system (Pb-Ag).

TEXT BOOK

1Applied Chemistry – A text book for Engineers and Technologists; Roussak, Hymand.Gesser

REFERENCE BOOKS

1.Industrial Chemistry by Helen Njeri Njenga, African Virtual University.
2.Engineering Chemistry by Mary Jain Shultz
3.Chemistry in Engineering and Technology, Volume 2, J C Kuriacose & J Rajaram, The Tata McGraw Hill, New Delhi.