

SYLLABUS :-

Prerequisite - Nil Technological importance of corrosion study, corrosion as non equilibrium process, corrosion rate expressions, electrochemical principles of corrosion-cell analogy, concept of single electrode potential, reference electrodes, e.m.f. and galvanic series-their uses in corrosion studies, polarization, passivity. Different forms of corrosion-uniform attack, galvanic, crevice, pitting, intergranular, selective leaching, erosion, stress corrosion cracking-their characteristic features, causes and remedial measures. Principles of corrosion prevention-material selection, control of environment including inhibitors, cathodic and anodic protection, coatings and design considerations. Corrosion testing methods. Introduction to high temperature corrosion, Pilling-Bedworth ratio, oxidation kinetics, oxide defect structures, Wagner-Hauffe valence approach in alloy oxidation, catastrophic oxidation, internal oxidation. Scaling of binary and ternary alloys, Considerations in high temperature alloy design, prevention of high temperature corrosion -use of coatings. Hydrogen Damage-Sources, Types of damage, Mechanisms and preventive methods, Liquid metal attack - liquid metal embrittlement, preventive measures, Chemical degradation of non-metallic materials like rubbers, plastics, ceramics etc. Text Books: 1. M. G. Fontana : Corrosion Engineering , 3rd edition, Mc Graw Hill International, 1987. 2. U. K. Chatterjee, S. K. Bose and S. K. Roy: Environmental Degradation of Metals, Marcel Dekker, 2001.