MM5320: CORROSION ENGINEERING

Course Content:

Corrosion principles: Electrochemical aspects, environmental effects, metallurgical aspects, economics of corrosion Thermodynamical aspects: Electrified interface (metal-electrolyte interface), potential difference, EMF series, Nernst Equation and Pourbaix diagram Kinetic aspect: Corrosion rate, Current density, Exchange current density, Mixed potential theory, Polarization, relation between corrosion rate and overpotential, Passivation Forms of corrosion characteristics, mechanisms, prevention, and testing. Corrosion testing: DC and AC methods of testing, polarization measurements- Corrosion rate assessment by Tafel's extrapolation method, Linear polarization resistance (LPR).

Text Books:

1. Corrosion Engineering, **Mars. G. Fontana**. Published by Tata McGraw Hill Education Pvt. Ltd., 2005.
2. Electrochemical Techniques in Corrosion Science and Engineering. **R.G. Kelly, J.R. Scully, D.W. Shoesmith, R.G. Buchheit**. Published by Marcel Dekker Inc., 2002

Reference Books:

1. Corrosion: Metal / Environment Reactions, Volume 1, **L.L. Shreir, R.A. Jarman, G.T. Burstein, Butterworth-Heinemann**, 1994.
2. Principles and Prevention of Corrosion, **Denny A. Jones**, Prentice Hall, 1995.
3. Corrosion and Surface Chemistry of Metals, **Dieter Landolt**, EPFL Press, 2007.
4. Corrosion of Stainless Steels, **A. John Sedriks, Wiley**-Interscience, 1996.

Prerequisite:

NIL