VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Department of Metallurgy& Materials Engineering

Lecture Plan- Corrosion and Degradation of Materials

Subject Name	:	Corrosion and Degradation of Materials
Credits	:	3-1-0-4
Prerequisite	:	None
Department	:	Metallurgy & Materials Engineering
Session	:	2016-17 (Even Semester)
Level	:	Undergraduate (VIII-Semester)
Course Instructor	:	Nilakantha Sahu
Category	:	Compulsory course for all B. Tech VIII Semester students of MME Department.

Class Schedule			
Monday – B321	Tuesday – B321	Wednesday– B321	Friday – B321
11:20-12.10 AM	10:30-11:20 AM	2:30-03:20 AM	04:10-05:00 AM

Marks Distribution		
End Term	Mid Term	Assignments + Class Test
70	**20**	**10**
Total -100 Marks		

Required Text book

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

COURSE CONTENTS

Sl. No	TOPIC	HOURS
1.	Introduction, importance of corrosion study	1
2.	Corrosion as non-equilibrium process	2
3.	Electrochemical principles of corrosion-cell analogy	1
4.	Concept of single electrode potential	1
5.	Reference electrodes	1
6.	E.M.F. and Galvanic series-their uses in corrosion studies	2
7.	Corrosion rate expressions	1
8.	Polarization	1
9.	Passivity.	1
10.	Class test-1	1
11.	Different forms of corrosion-uniform attack	1
12.	Galvanic.	1
13.	Crevice	1
14.	Pitting	1
15.	Intergranular, stress corrosion cracking	1
16.	Their characteristic features, causes and remedial measures	2
17.	Principles of corrosion prevention-material selection	1
18.	Control of environment including inhibitors	1
19.	Class test-2	1
20.	Cathodic and anodic protection	2
21.	Coatings and design considerations	1
22.	View factor	1
23.	Corrosion testing methods.	1

24.	Introduction to high temperature corrosion	1
25.	Pilling- Bedworth ratio	1
26.	Oxidation kinetics	1
27.	Oxide defect structures	1
28.	Class test-3	1
29.	Considerations in high temperature alloy design,., , ,	1
30.	Prevention of high temperature corrosion -use of coatings	1
31.	Hydrogen damage-sources	1
32.	Types of damage, Mechanisms and preventive methods	1
33.	Liquid metal attack - liquid metal embrittlement	1
34.	Preventive measures	1
35.	CLASS TEST -4	1

Note for students:

1. This is the syllabus; I planned for the "Corrosion and Degradation of Materials" course of Session 2016-17 (Even semester). If you have any query/suggestions mail me on nilakantha.iitr@gmail.com
2. This course includes tutorials (from every chapter) and Class test.
3. By end of this course student must have 75% attendance, to eligible for the end semester examination.