



DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.TECH (III year)		
Course Title	Corrosion Engineering		
Course Code	MTPC24	No. of Credits	3
Course Code of Pre-requisite subject(s)	Nil		
Session	Jan 2022	Section (if, applicable)	NA
Name of Faculty	Dr. A. Muthuchamy	Department	MME
Email	muthuchamy@nitt.edu	Telephone No.	9445939319
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail		Telephone No.	
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
Syllabus (approved in BoS)			
Electrochemical and thermodynamic principles, Nernst equation and electrode potentials of metals, EMF and galvanic series, merits and demerits; origin of Pourbaix diagram and its importance to iron, aluminium and magnesium metals Exchange current density, polarization- concentration, activation and resistance, Tafel equation; passivity, electrochemical behaviour of active/passive metals, Flade potential, theories of passivity Atmospheric, pitting, dealloying, stress corrosion cracking, intergranular corrosion, corrosion fatigue, fretting corrosion and high temperature oxidation; causes and remedial measures Purpose of testing, laboratory, semi-plant and field tests, susceptibility tests for IGC, stress corrosion cracking and pitting, sequential procedure for laboratory and on-site corrosion investigations, corrosion auditing and corrosion map of India Corrosion prevention by design improvements, anodic and cathodic protection, metallic, non-metallic and inorganic coatings, mechanical and chemical methods and various corrosion inhibitors			
COURSE OBJECTIVES			
To acquire knowledge on principles, various forms, testing, monitoring and prevention of corrosion phenomenon.			
COURSE OUTCOMES (CO)			
Course Outcomes		Aligned Programme Outcomes (PO)	
At the end of the course student will be able to:		Low	Medium
CO1	basic principles related to thermodynamic feasibility of corrosion phenomenon in metals and alloys.		1, 2
CO2	basics of kinetics of electrochemical corrosion, relevant theories		1, 2

	and equations.			
CO3	manifestations of corrosion phenomenon through their origin, mechanisms and remedies.			1, 2
CO4	origin and causes of high temperature oxidation through their kinetics, governing equations and remedies.			1, 2
CO5	Different methods of corrosion testing, susceptibility tests, corrosion auditing and map of India.		4, 7	1, 2
CO6	Various corrosion preventive methods through design, coatings, inhibitors, cathodic and anodic protection Industrial examples to highlight the above phenomena		4, 5	3, 6, 12

COURSE PLAN – PART II

COURSE OVERVIEW

The course discuss in detail about the principles and extraction of the some important non-ferrous metals and their significance to the mankind

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I-III	basic principles related to thermodynamic feasibility of corrosion phenomenon in metals and alloys	Online lectures + animated/real videos
2	IV-VI	basics of kinetics of electrochemical corrosion, relevant theories and equations.	
3	VII-IX	manifestations of corrosion phenomenon through their origin, mechanisms and remedies.	
4	X-XI	origin and causes of high temperature oxidation through their kinetics, governing equations and remedies.	
5	XII-XIII	Different methods of corrosion testing, Various corrosion preventive methods through design, coatings, inhibitors, cathodic and anodic protection Industrial examples to highlight the above phenomena	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Quiz - I	March 29 th	30	20
2	Quiz - II	April 8 th	30	20
3	Assignment	10 th April	--	30
CPA	Compensation Assessment	XIII	60	20
4	Final Assessment	XV	120	30

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

The exit survey will be assessed based on the questionnaire prepared by the class teacher and expected attainment is 75% on 1-10 scale basis

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Email/Mobile

COMPENSATION ASSESSMENT POLICY

It will be given during XIII week for those who are absent on genuine grounds for any one of the Cycle Tests.

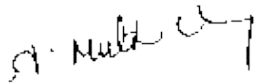
ATTENDANCE POLICY

- Institute guidelines will be followed for attendance


ADDITIONAL INFORMATION

The Course faculty is available for consultation at any time. Students can also contact him at any time through whatsapp or phone call or by mail.

FOR APPROVAL


Course Faculty
Dr. A. Muthuchamy


C-Chairperson
Dr. Jerome


HOD
Prof. B. Ravisankar