

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

This course outline template acts as a guide for writing your course outline. As every course is different, please feel free to amend the template/ format to suit your requirements.

COURSE OUTLINE TEMPLATE			
Course Title	CORROSION ENGINEERING		
Course Code	MT 613	No. of Credits	3
Department	MME	Faculty	Prof. S.NATARAJAN
Pre-requisites Course Code			
Course Coordinator(s) (if, applicable)			
Other Course Teacher(s)/Tutor(s) E-mail	sn@nitt.edu	Telephone No.	9486001136
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Elective course		
COURSE OVERVIEW			
Introduction about the concepts of Corrosion Engineering and develop expertise on how to apply the concepts in practical scenarios.			
COURSE OBJECTIVES			
To provide a technical exposure on principles of corrosion phenomenon, its various forms, susceptibility tests, mitigation and some case studies in engineering field.			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes(PO)		
At the end of this course, the student will			
1. Be thorough with thermodynamic and kinetic principles and forms of corrosion.	1 & 2		
2. Understand experiments on how to determine the corrosion rate by weight loss method, electrical resistance method, potentiostatic polarization experiment and atmospheric corrosion using color indicator method	1, 2		
3. Understand experiments on how to Analyze galvanic corrosion, pitting corrosion and stress corrosion cracking	3, 9		
4. Understand experiments on how to Estimate the corrosion resistance by IGC susceptibility test, salt spray test and coating thickness	5, 9, 10		
5. Get a comprehensive outline exposure on case studies pertinent to corrosion and its control in power plants, process industries and national scenario.	11		

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1	1 st , 2 nd week	Principles of corrosion phenomenon: Thermodynamics and kinetics: emf/galvanic series, Pourbaix diagram, exchange current density, passivity, Evans diagram, flade potential.	Chalk talkand PPT presentations
2	3 rd week	Numerical Problems Practice	Work out
3	4 th , 5 th week	Different forms of corrosion: atmospheric/uniform, pitting crevice, intergranular, stree corrosion, corrosion fatigue, dealloying, high temperature oxidation-origin and mechanism with specific examples.	Chalk talkand PPT presentations
4	6 th , 7 th week	Numerical Problems Practice & Cycle Test 1	Chalk talkand PPT presentations
5	8 th , 9 th week	Corrosion testing and monitoring: Non-Electrochemical and Electrochemical methods: weight loss method, Tafel Linear polarization and Impedance techniques, Lab, semi plant & field tests, susceptibility test.	Chalk talkand PPT presentations
6	10 th , 11 th week	Numerical Problems Practice	Chalk talkand PPT presentations
7	12 th , 13 th week	Corrosion prevention through design, coatings, inhibitors, cathodic, anodic protection, specific applications, economics of corrosion control.	Chalk talkand PPT presentations
8	14 th , 15 th week	Corrosion & its control in industries: Power, Process, Petrochemical, ship building, marine and fertilizer industries. Some case studies-Corrosion and its control in different engineering materials: concrete structures, duplex, super duplex stainless steels, ceramics, composites and polymers. Corrosion auditing in industries, Corrosion map of India.	Chalk talkand PPT presentations
9	16 th week	Final Examination	

COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment I (Cycle test I)	7 th week	1 hour	20 %
2	Assessment II (Cycle test II)	13 th week	1 hour	20 %
3	Assignment			10 %
4	Final Exam	16 th week	3 hours	50 %
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				
1. Fontana. M.G., Corrosion Engineering, Tata McGraw Hill, 3rd Edition, 2005.				
2. Jones.D.A. Principles and Prevention of Corrosion, 2nd Edition, Prentice Hall, 1996.				

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)
<ol style="list-style-type: none"> 1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept 2. Feedback form issued to students to express their comments about the course before cycle test & after completing the syllabus. Students are requested to give feedback about the course. 3. Student knowledge about the subject covered will be judged through marks obtained in examination

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

1. Examination

- a) Students who have missed the first and second assessment or both can register the re-test examination which shall be conducted after the completion of second cycle test and before the final examination
- b) The re-test shall be conducted for 20 marks comprising the syllabus for both first and second cycle tests
- c) Students should submit assignments before last date of submission in case students fail to submit within the last date, he/she will get zero marks for the same

2. Attendance

- a) The minimum attendance for appearing for the final examination is 75 %
- b) Those students who are having attendance below 75 % should attend additional classes before appearing for final examination
- c) The institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessment of a course will be done on the basis of marks
- d) The passing mark should be $x/2$ or $X_{max}/3$ whichever is less where x is the mean of the class and X_{max} is the maximum mark in the class
- e) The letter grades and the corresponding grade points are as follows:

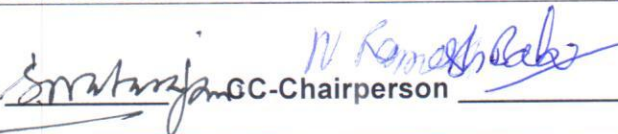
Letter	S	A	B	C	D	E	F
Grade	10	9	8	7	6	5	0

- 1. Students scoring less than minimum passing mark in the assessments defined in the course plan shall be deemed to have not successfully completed the course and be given an 'F' grade
- 2. Students awarded F grade may appear for re-examination
- 3. All students who earn a minimum of 5 grade points in a course is declared to have successfully completed the course
- 4. If the students fail to appear semester examination due to medical reason can register for special end semester examination after approval from course teacher and HoD. The special end semester examination will be conducted within ten days from reopening of institute for next semester. Students should register their names with course teacher to appear for special end semester examination within three days from reopening institute for next semester. Grade issued as per the guidelines followed for his/her batch students.

ADDITIONAL COURSE INFORMATION

FOR SENATE'S CONSIDERATION

Course Faculty



GC-Chairperson

HOD

