



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Marine Engineering		LP: MR18007
B.E/B.Tech/M.E/M.Tech : Marine Engineering	Regulation:2018	Rev. No: 00
PG Specialisation : Not Applicable		Date: 16.02.2022
Sub. Code / Sub. Name : MR18802/ Marine corrosion and prevention		
Unit : I		

Unit I Syllabus: Atoms & Ions, PH value, electrochemical corrosion. Mechanism of corrosion- Factors influencing corrosion-Electrochemical series, galvanic series-Galvanic cell- chemical corrosion – Electrochemical corrosion-Direct chemical attack– Electro-Chemical attack – Reasons – Remedial measures. Various types of corrosion

Objective: To learn about a Mechanism of corrosion and types of corrosion. Students will understand the various factors influencing the corrosion.

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Atoms & Ions, PH value,	T1 Pg93-94	PPT/Notes/BB
2.	Electrochemical corrosion. Mechanism of corrosion-	T1 Pg14, T1 Pg53,124	PPT/Notes/BB
3.	Factors influencing corrosion- Various types of corrosion	T1 Pg45, T1 Pg38	PPT/Notes/BB
4.	Electrochemical series, galvanic series-Galvanic cell-	T1 Pg174, T1 Pg 14 -21	PPT/Notes/BB
5.	chemical corrosion	T1 Pg 307	PPT/Notes/BB
6.	Electro chemical corrosion	T1 Pg 14 -21	PPT/Notes/BB
7.	Direct chemical attack	T1 Pg282	PPT/Notes/BB
8.	Electro-Chemical attack, Reasons	T1 Pg19	PPT/Notes/BB
9.	Remedial measures.	T1 PG278	PPT/Notes/BB
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes



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Unit : II

Unit II Syllabus : Plate preparation during building and repair periods -Atmospheric corrosion Mill scale – flame cleaning – Acid Pickling – Blast cleaning – causes of paint failure – shipboard preparations for painting – power wire brushing – power disc – air hammer – High pressure water blasting – sand blasting, shot blasting

Objective: To learn and understand Various methods employed for hull plate surface preparation.

Session No *	Topics to be covered	Ref	Teaching Aids
10.	Plate preparation during building and repair periods -	R4 Pg111	PPT/Notes/BB
11.	Atmospheric corrosion Mill scale	R4 Pg111	PPT/Notes/BB
12.	Flame cleaning Acid Pickling	R4 Pg111, R4 Pg 112	PPT/Notes/BB
13.	Blast cleaning	R4 Pg 112	PPT/Notes/BB
14.	Causes of paint failure	R4 Pg 114	PPT/Notes/BB
15.	Shipboard preparations for painting	R4 Pg 114	PPT/Notes/BB
16.	Power wire brushing	R4 Pg 115	PPT/Notes/BB
17.	Power disc & Air hammer	R4 Pg 115	PPT/Notes/BB
18.	High pressure water blasting and sand blasting, shot blasting	R4 Pg 115	PPT/Notes/BB
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



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Unit : III

Unit III Syllabus : Basic composition of paint - Alkyd – bitumen – chlorinated rubber – coal tar epoxy – Epoxy – Oleoresinous – phenolic – polyurethane – primers – vinyl – self polishing copolymers . Shipboard paint systems- Underwater AF paints .Boot top anti-corrosive paints – Super structure paint

Objective: To learn about Modern paints used for ship structures.

Session No *	Topics to be covered	Ref	Teaching Aids
19.	Basic composition of paint	R4 Pg 115	PPT/Notes/BB
20.	Alkyd Paints	R4 Pg 115	PPT/Notes/BB
21.	Bitumen Paints	R4 Pg 115	PPT/Notes/BB
22.	chlorinated rubber , Coal tar epoxy	R4 Pg 116	PPT/Notes/BB
23.	Epoxy – Oleo resinous	R4 Pg 116	PPT/Notes/BB
24.	Phenolic – polyurethane , primers – vinyl Paints	R4 Pg 121	PPT/Notes/BB
25.	Self-polishing copolymers.	R4 Pg 125	PPT/Notes/BB
26.	Shipboard paint systems and Underwater AF paints	R4 Pg 125	PPT/Notes/BB
27.	Boot top anti-corrosive paints, Super structure paint	R4 Pg 125	PPT/Notes/BB
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



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Unit : IV

Unit IV Syllabus: Effect of salts & Grease in feed water. Effect of corrosion while boiler is not in service – preservation to avoid corrosion. Corrosive wear of cylinder liners – Reasons, remedies & effects – corrosion of Main Engine Jacket cooling spaces – Reasons and remedies – Corrosion in bearings

Objective: To learn and understand Corrosion that occurs in boiler and marine diesel engine.

Session No *	Topics to be covered	Ref	Teaching Aids
28.	Effect of salts & Grease in feed water. Effect of corrosion while boiler is not in service	R3 Pg59	PPT/Notes/BB
29.	Preservation to avoid corrosion.	R3 Pg60	PPT/Notes/BB
30.	Corrosive wear of cylinder liners	R3 Pg60	PPT/Notes/BB
31.	Hot corrosion and cold corrosion	R3 Pg 61	PPT/Notes/BB
32.	Reasons, remedies & effects	R3 Pg 61	PPT/Notes/BB
33.	corrosion of Main Engine Jacket cooling spaces	R3 Pg 63	PPT/Notes/BB
34.	Reasons and remedies	T1 Pg243	PPT/Notes/BB
35.	Corrosion in bearings- reasons and remedies	T1 Pg244	PPT/Notes/BB
36.	Revision	-	PPT/Notes/BB
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



Sub. Code / Sub. Name: MR18802/ Marine corrosion and prevention

Unit : V

Unit V Syllabus: Anodic & cathodic protection. Anodic control protection- Forms of metallic coatings – anodizing – phosphating. Cathodic protection- sacrificial anodes, Impressed Current Cathodic protection. Design faults causing corrosion

Objective: To learn and understand various Methods of preventing the corrosion.

Session No *	Topics to be covered	Ref	Teaching Aids
37.	Anodic & cathodic protection.	T1 Pg294	PPT/Notes/BB
38.	Anodic control protection-	T1 Pg300	PPT/Notes/BB
39.	Forms of metallic coatings	T1 Pg 15-19	PPT/Notes/BB
40.	Anodizing protection of metallic surface and its types	T1 Pg304	PPT/Notes/BB
41.	Phosphating on metallic surface	T1 Pg236	PPT/Notes/BB
42.	Cathodic protection	T1 Pg357	PPT/Notes/BB
43.	Sacrificial anodes, anodic protection	R4 Pg106	PPT/Notes/BB
44.	Impressed Current Cathodic protection	R4 Pg107	PPT/Notes/BB
45.	Design faults causing corrosion	R4Pg110	PPT/Notes/BB

Content beyond syllabus covered (if any):

* Session duration: 50 mins



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TEXT BOOKS:

1. Corrosion engineering 3rd edition Mars G by McGraw Hill 2010
2. Corrosion, prevention and control Raj Baldev, Mudali, Kamatchi Narose publishing house, 2009

REFERENCES:

1. Corrosion science and technology Mechanism , migration and monitoring by Mudali, Kamachi Narosa publishing house 2008
2. Introduction to metallic corrosion and its prevention Raj Narayan Oxford & IBM publishing
3. Marine engineering practice vol 2 Part II Corrosion for marine & offshore engineers 1st edition Rowlands JC
4. Ship Board Operations 2nd Edition HI Lavery Butterworth – Heinemann 2007

	Prepared by	Approved
Signature	<i>Dr. A. Mohan</i>	<i>S.K.</i>
Name	Dr. M. Anandan	Prof. S. Krishnan
Designation	Associate Professor	HoD
Date	16.02.2022	16.02.2022
Remarks *:		
Remarks * :		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD