



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE OUTCOMES - THEORY

Department :Marine engineering	LP: MR 18402
<u>Student Branch</u> Marine engineering Regulation:2018	Rev. No: 00
Sub. Code / Sub. Name : MR 18402 – Marine diesel engines – I	Date: 25.02.2022
Unit : I	

Unit Syllabus: Fuel Technology

- Objective:** 1. To impart knowledge of liquid marine fuels and its properties
2. To study about Control of NOx and SOx emissions

Session No *	Topics to be covered	Ref	Teaching Aids
1	Study of liquid fuels , Petroleum and distillation process	5,Pg,3 3-37	P/Point B/B
2	Properties of fuel-Flash point, fire point, Calorific value, Ignition quality, Carbon residue, surface tension, water content, ash content .etc,	5,Pg,3 3-37	P/Point B/B
3	Testing of fuel- Flash point, fire point, Calorific value, Ignition quality, conrodson value, water content, ash content .etc,	5,Pg,3 3-37	P/Point B/B
5	Combustion of fuel in diesel engines-Atomization, penetration, turbulence, Ignition lag, ignition delay.	2,Pg22 8	P/Point B/B
5	Air for combustion, effect of insufficient / excess air on combustion.	2,Pg- 98,100	P/Point B/B
6	.Effect of bad and improper combustion in marine diesel engines.	2,Pg-2	P/Point B/B
7	Compression pressure ratio and its effect on engines	2,Pg-2	P/Point B/B
8	Causes and effects of variation in compression pressure and peak pressure.	2,Pg- 60&61	P/Point B/B
9	Marine air pollution –causes and effects.	2,Pg- 65- 87,839	P/Point B/B
10	Various methods of control of Nox in Exhaust emission from ships.		
11	Various methods of control of Sox in Exhaust emission from ships.		
12	Summary of unit-I		

Content beyond syllabus covered (if any):

* Session duration: 50 minutes



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Sub. Code / Sub. Name: MR 18402 – Marine diesel engines – I

Unit : II

Unit Syllabus: Types and Characteristics of I.C. Engine:

- Objective:**
1. To understand the basic performance characteristics of I.C. Engines.
 2. To learn the suitability requirements and various purpose of I.C. Engines.
To make the comparative study of 2 stroke and 4 stroke engines.
 3. Study of heat balance diagram

Session No *	Topics to be covered	Ref	Teaching Aids
13	Diesel Engines-Principle of working of two stroke and four stroke engines.	1,Pg-1-5	P/Point B/B
14	Construction of 2 stroke engines.	7,Pg-2	P/Point B/B
15	Construction of 4 stroke engines.	5,Pg-26,27	P/Point B/B
16	Timing diagrams of 2 strokes engines	5,Pg-27&28	P/Point B/B
17	Timing diagrams of 4 strokes engines	7,Pg-15&17	P/Point B/B
18	Comparative study of 2 stroke and 4 stroke engines.	7,Pg-9	P/Point B/B
19	Comparative study of low speed, medium speed and high speed diesel engines	7,Pg-9	P/Point B/B
20	Mean Piston speed, M.C.R & C.S.R ratings.	1,Pg-14,	P/Point B/B
21	Practical heat balance diagrams and thermal efficiency of diesel engines.	1,Pg-5-2,Pg-21	P/Point B/B
22	Mean effective power, engine indicated power.		
23	Video presentation of two stroke and four stroke working.		
24	Summary of unit-II		
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes



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Sub. Code / Sub. Name: MR 18402 – Marine diesel engines – I

Unit : III

Unit Syllabus: Construction of large two stroke marine diesel engines.**Objective:** To acquire knowledge of construction of various parts of large two stroke marine diesel Engines.

Session No *	Topics to be covered	Ref	Teaching Aids
25	General Construction of Marine Diesel Engines.	7,Pg-32,47&48	P/Point B/B
26	Construction of bed plates & A-frames.	7,Pg-33-45	P/Point B/B
27	Construction of cylinder liners, jackets and lubricating quills. Cylinder lubrication.	1,Pg-377	P/Point B/B
28	Construction of cylinder heads and starting air valve.	4,Pg-288	P/Point B/B
29	Construction of fuel injector, relief valve and indicator cocks.	1,Pg-231-232	P/Point B/B
30	Construction of piston and piston rings, piston ring clearances.	5,Pg-222-227	P/Point B/B
16	Construction of cylinder liner and quill. Measurement of liner wear. Causes effects of liner wear.	2,Pg-661	P/Point B/B
31	Construction of cross head and connecting rods.	5,Pg-193-211	P/Point B/B
32	Difficulties faced in cross head lubrication and methods to overcome.	5,Pg 167&168	P/Point B/B
33	Construction of diaphragm and stuffing box,	5,Pg 167&168	P/Point B/B
34	Stuffing box rings clearances.	5,Pg 167&168	P/Point B/B
35	Construction of bottom end and main bearings	4,pg 72-73	P/Point B/B
36	Summary of unit-III		P/Point B/B

Content beyond syllabus covered (if any):

* Session duration: 50 minutes



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Sub. Code / Sub. Name: MR18402 – Marine diesel engines – I

Unit : IV

Unit syllabus:

1. Cooling, Scavenging and supercharging arrangements of marine diesel engines.
2. Cooling Systems of marine engines.

Objective:

To make a detail study of various types of scavenging, super charging of marine diesel engines, and construction of turbochargers and air coolers. Cooling systems and cooling mechanisms.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Scavenging arrangements in large marine diesel engines, under piston scavenging.	1,Pg-30-33	P/Point B/B
38	Various types of scavenging	2,Pg-434,7	P/Point B/B
39	Merits and demerits of Various types of scavenging.	5,Pg-237	P/Point B/B
40	Super charging- Pulse and constant pressure charging, merits and demerits.	1,Pg-30,31	P/Point B/B
41	Construction of turbochargers(Cooled and un-cooled)	5,Pg373	P/Point B/B
42	Turbocharger lubrication system for cooled and un-cooled turbochargers.	2,Pg-181,3	P/Point B/B
43	Turbocharger surging, causes and effects. Water washing of turbochargers, latest methods adopted	2,Pg-175,1	P/Point B/B
44	Scavenge fires-Caucus effects and remedies, Purpose of cooling air for main engine. Construction of main engine air coolers.	2,Pg-175,1	P/Point B/B
45	Need for cooling piston cylinder jackets and cylinder heads. Causes at cylinder liner and cylinder heads.	4,pg 30-34	
46	Methods of cooling piston cylinder liner and cylinder heads, cooling conveying mechanism	4,pg 50-51	P/P POINT
47	Various cooling media, their merits and demerits, cooling water testing and treatment.	4,pg 173-176	B/B P/P Point
48	Summary of unit-V		
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes



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Sub. Code / Sub. Name: MR 18402 – Marine diesel engines – I

Unit :V

Unit Syllabus: Construction of crank shaft and cam shaft and cam shaft drive.

Objective: 1. To study the construction of various types of crank shaft and cam shafts.
2. To study the crank shaft deflection and the method of taking deflections.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Construction of single piece crank shafts	4,Pg-60	P/Point B/B
50	Construction of semi built crank shafts	4,Pg-59	P/Point B/B
51	Construction of fully built crank shafts	4,Pg-58	P/Point B/B
52	Construction of cams and Cam shafts.	4,Pg-146	P/Point B/B
53	Construction of chain links and chain drive	4,Pg-64	P/Point B/B
54	Chain tensioning and renewal procedure.	4,Pg-65-68	P/Point B/B
55	Study of crank shaft alignment		P/Point B/B
56	Study of crank shaft deflection and purpose of taking crank shaft deflections.	4,Pg-61	P/Point B/B
57	Method of taking crank shaft deflections.	4,Pg-63	P/Point B/B
58	Recording of crank shaft deflection readings and interpretation of readings.	4,Pg-63	P/Point B/B
59	Precautions taken before and during taking crank shaft deflections.	4,Pg-63	P/point
60	Summary of unit V		P/point

Content beyond syllabus covered (if any):

* Session duration: 50 minutes



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REFERENCES:**TEXT BOOKS:**

1. D.A. Taylor, "Introduction to Marine Engineering", 2nd Edition, Butter worth – Heinemann, London, 1999
2. Wood yard, Doug, "Pounder's Marine Diesel Engines", 7th Edition, Butter Worth Heinemann Publishing, London, 2001.
3. S. H. Henshall, "Medium and High Speed Diesel Engines for Marine Use", 1st Edition, Institute of Marine Engineers, Mumbai, 1996.
4. Devan aranha," Marine Diesel engine", sixth reprinted edition,2012

REFERENCE BOOKS:

5. D.K. Sanyal, "Principle & Practice of Marine Diesel Engines", 2nd Edition, Bhandarkar Publication, Mumbai,
6. Engineering knowledge (Motor) Volume-I
Notes prepared By: Prof. K. Venkataraman. CEng, FIMarE, MIE.
7. Engineering knowledge (Motor) Volume-II
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