GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology	Branch/Spec.	Marine Engineering
Semester	V	Version	2.0.0.0
Effective from Academic Year	2020-21	Effective for the batch Admitted in	Aug 2018
Subject code	2MR503	Subject Name	Marine Internal Combustion Engine - II

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	0	0	3	Theory	40	60	100
Hours	3	0	0	0	3	Practical	0	0	0

Pre-requisites:

Learning Outcome:

After successful completion of the course, student will be able to

- Comply with the TAR Book Competency number 4.3.1, 5.4, 9.2 & 9.4

Theory syllabus

Unit	Content	Hrs
1.	**Fuel pumps and metering devices:** • Jerk and Common rail systems; Fuel injection systems helical groove and spill valve type Fuel Pumps. System for burning heavy oil in slow and medium speed marine engine, V.I.T. & Electronic injection system. • Effect of viscosity on liquid combustion. • Measuring equipment and its working principle. • Necessity of variable fuel injection system. • Procedure of application on a modern slow speed long stroke engine. Necessity for adoption of fuel quality setting system. • Incorporation of FQSL along with the V.I.T. system of the engine.	**10**
2.	**Manoeuvring Systems:** • Overview of Starting and reversing systems of different Marine Diesel engine with safety provisions.(On Simulator)	**4**
3.	**Indicator diagrams and Power Calculation:** • Construction details of indicator instrument. Study of different types of indicator cards, Significance of diagram Power Calculations, fault detection, simple drew cards and out of Phase diagrams. • Power balancing, Performance Characteristic Curves, Test bad and Sea trials of diesel engines.	**8**
4.	Lubrication arrangement in diesel engine including Coolers & Filters, Cylinder-lubrication, Linear wear and preventive measures, Combinations of lubricating oil its effect and preventive measures. • Improvements in Lubricating oils though use of additives. Types of additive • Monitoring engines though lubricating oil analysis reports.	**10**
5.	**Automation in modern diesel plants:** • Remote operation, Alarm and fail safe system. • Changeover of remote/automatic to local control of main and auxiliary system	**6**

	• Governors and their basic functions Constant speed and Over speed governors. Constructional details and hunting of governor. Electronic Governor • Computerized monitoring and diagnostic applications in propulsion engines. • Concept of intelligent engine • Concept of U.M.S.	
6.	**Maintenance of diesel engines:** • Inspection and replacement of various Component members such as Piston, Piston ring, X-head & other bearings, Cylinder Head(air start valve, relief valve, exhaust valve, fuel injector) Liner, Bearings, Driving Chain and gears and preparation of decarbonizing report of main and auxiliary engine. • Overhauling of turbocharger • Crankshaft deflection and alignment. Crankshaft Slip • Crankcase inspection and its procedure • Engine holding down arrangements. • Tightening of Tie bolts. • Action to be taken in case of stoppage of main engine, blackout, failure of other auxiliary equipment necessary for main propulsion	**10**
7.	**Modern trends in development:** • Current Engine (Sulzer RTA B&W LMC & SMC). • Intelligent Engine (Camless concept). • Improvement in design for increased TBO. NOx – Control of marine Diesel Engines. • All latest Technology incorporated in as modern propulsion machinery ships.	**6**
	TOTAL	**54**
Practical content		
Text Books		
1 2	Lamb's Marine Diesel Engine." Marine Diesel Engine", DevenArhana	
Reference Books		
1 2 3	Wood yard, Goug, "Pounder's Marine Diesel Engines". 8th Edition, Butter Worth Heinemann Publishing, London, 2001. "Slow speed Diesel Engine", Institute of Marine Engineer. D K Sanyal, "Principal & Practice of Marine Diesel Engines", 2nd Edition, Bhandarkar Publication, Mumbai, 1998	