

# GUJARAT TECHNOLOGICAL UNIVERSITY

## MARINE ENGINEERING

### B. E. SEMESTER: VII

Subject Name: **Marine Internal Combustion Engine –II**

Subject Code: **171805**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	0	0	4	70	0	30	50

Sr. No	Course Content	Total Hrs.
1.	<b>Fuel pumps and metering devices :</b>  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 engines.	08
2.	<b>Manoeuvring Systems :</b>  Starting and reversing systems of different Marine Diesel engines with safety provisions.	03
3.	<b>Indicator diagrams; and power calculations :</b>  Construction details of indicator instrument. Significance of diagram Power Calculations, fault detection, simple draw cards and out of phase diagrams. Power balancing, Performance characteristic Curves, Test bed and Sea trials of diesel engines.	09
4.	<b>Lubrication Systems :</b>  Lubrication arrangement in diesel engines including Coolers & filters Cylinder, Lubrication, Liner wear mechanism and preventive measures, combinations of lubricating oil its effect and preventive measures.	06
5.	<b>Medium Speed Engines :</b>  Different types of medium speed marine Diesel engines, couplings, and reduction gears used in conjunction with medium speed Engine, development in exhaust valve design, V-type engine details.	07

6.	<b>Gas Turbines :</b>  General Constructional and Design features for marine plants, materials of construction, Heat exchangers and Reheat arrangements, Comparison of Free Piston engine gasifiers and conventional air-stream combustion chambers.	<b>08</b>
7.	<b>Automation in modern diesel engine plants :</b>  Remote operation, Alarm and fail safe system, Governors and their basic functions. Constant speed and Overspeed governors. Constructional details and hunting of governor.	<b>05</b>
8.	<b>Maintenance of diesel engines :</b>  Inspection and replacement of various Component members such as Piston ring, Cylinder head, Liner, Bearings, Driving chain and gears etc. crankshaft deflection and alignment. Engine holding down arrangements, Trouble shooting in diesel engine.	<b>05</b>
9.	<b>Modern trends in development:</b>  Current Engines (Sulzer RTA, B&W CMC& SMC, SEMT Pielstik), Intelligent Engine (Camless concept), improvement in design for increased TBO. U.M.S. Operations of ships.	<b>09</b>

### **Text Books:**

1. Marine Internal Combustion Engines by A.B. Kane, Stirling Book House
2. Internal Combustion Engines by Mathur and Sharma
3. Internal Combustion Engines by Domdkundwar Dhanpat Rai and sons

### **Reference book:**

1. Pounder's Marine Diesel Engines & Gas Turbines, 8/E by Doug Woodyard