GUJARAT TECHNOLOGICAL UNIVERSITY
MARINE ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Marine Steam Engineering**
Subject Code: **171804**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	0	0	3	70	0	30	50

Sr. No	Course Content	Total Hrs.
1.	**Marine Steam Turbines:** Development in steam engines. Reciprocating engines to low pressure steam turbines and to high Superheat, Reheat and Regenerative plants. General principles of construction and design. Simple Impulse, Pressure compounded Impulse, pressure Compounded Impulse, Pressure Velocity Compounded Impulse, Parsons Axial flow reaction turbine, Double flow turbine. Radial flow Reaction turbine, Double Casing Turbine.	**05**
2.	**Layout of plants :** General Layout and description of a modern geared Steam turbine installation including auxiliaries in marine use combined Gas Turbine & steam turbine circuits. Location of gears, Flexible Couplings and thrust Blocks. Steam Exhaust and Drain line system. Gland Steam System.	**05**
3.	**Selection of Materials:** Materials used for various components like blades, rotors, gears, casing and sealing glands etc and their justification.	**02**
4.	**Constructional Details:** Types of Blades & methods of fixing, Solid Built-up and Drum rotor for impulse and Reaction turbines, Casings for H.P & L.P. Impulse and reaction turbines, Diaphragms; nozzles and glands, Carbon glands and labyrinth packing glands, bearing and gears. All addendum gearing; Epicyclic gearing, Articulated type double reduction gearing for marine use. **Reduction gears:** Reduction ratio, type of gear teeth, gear construction, various arrangements of marine gearing, gear defects, flexible coupling, quill shaft.	**09**

5.	**Lubrication of Turbines :** Suitable oil and their properties Film Lubrication, Forced Lubrication, Lubrication of main bearings and gears. Types of all oil jets. Emergency lubrication arrangements.	**04**
6.	**Condensers:** Shapes and types of condensers, constructional details, location & method of securing, working principles, contraction and expansion allowances, leak test. Effect - change of temperature, circulating water quantity, change of main engine power, condenser surface.	**06**
7.	**Operation & Maintenance :** Warming up procedure of main propulsion turbines, Ahead and Astern running. Control of Power and speed of propulsion. Throttle valve control & Nozzle control Governing. Self Closing emergency stop valve, Emergency governors, Condenser Vacuum Control, Servomotor governors for generators, Quick engaging turning for turbines.	**06**
8.	**Turbine Trials:** Energy losses & heat balance methods of improving turbine efficiency. Emergency Operation of Turbines.	**04**
9.	Alignment checking, Bridge & Poker Gauge, Allowance of expansion, Sliding foot, Adjustment of Thrust bearing, Energy losses and heat balance, methods of improving.	**04**

Text Books:

1. Marine Internal Combustion Engines by A.B. Kane, Stirling Book House
2. Steam and gas turbines By R.Yadav Central Publishers

Reference book:

1. A Practical Guide to Steam Turbine Technology by Heinz P Blach McGraw Hill
2. Pounder's Marine Diesel Engines & Gas Turbines, 8/E by Doug Woodyard