

GUJARAT TECHNOLOGICAL UNIVERSITY

Marine Engineering B. E. SEMESTER: VI

Subject Name: **Applied Thermodynamics-II**

Subject Code: **161805**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
3	1	0	4	70	30	50

Sr. No	Course Content	Total Hrs.
1.	<p>Fuels , Combustion & Dissociation:</p> <p>Definition of Fuel, combustion. Combustion Equation, Analysis of the Products of Combustion, stoichiometric combustion, Actual combustion, Excess Air, Mixture strength, Dissociation. Effect of Dissociation on I.C. Engines.</p>	06
2.	<p>Gas Dynamics:</p> <p>One Dimensional steady flow of compressible fluids, Isentropic flow, Effect of Friction, Flow through Nozzles and Diffuser. Critical condition, Mach Number, Subsonic, Sonic and Supersonic Flow. Flow of steam through Nozzles and Diffusers. Supersaturated Flow of steam; Applied Problems.</p>	06
3.	<p>Steam Turbines:</p> <p>General Principles of Impulse and Reaction Turbines- Velocity Diagrams for simple Impulse and Impulse-Reaction Turbine. Compounding of Impulse Turbine-Pressure and velocity compounding. Force on blades, Work done by Blades, Axial Thrust, Blade or Diagram Efficiency. Effect of Friction on Blades, Applied Problems.</p>	10
4.	<p>Refrigeration:</p> <p>Reversed Carnot cycle, Vapour compression cycles, Refrigerating Effect, Co-efficient of performance, cooling capacity, Rating of a Refrigerating Plant, Methods of improving C.O.P. Use of Vapour Tables, Applied Problems. Typical Marine Refrigeration in liquefied gas carriers.</p>	14

5.	Transmission of Heat: Fourier's Law of Heat conduction. Thermal conductivity of Insulating Materials. Conduction through flat & cylindrical, spherical surfaces in series. Heat Transfer from fluids through walls. Application of Heat Transfer in Marine Heat Exchangers, like Coolers, Heaters, Condensers. Pre-diction of convection Heat Transfer rates. Use of Non-Dimensional Groups.	10
6.	Prandtl No. Nusselt No., Reynolds No., Stanton No., Grashof No, Graetz No.. etc, Natural and Forced Convection.	04
7.	Radiation: Basic, Stephen-Boltzman law, Grey I Black bodies etc.	02

Reference Books:

1. Thermal Engineering By R.K.Rajput, Laxmi Publications
2. Thermal Engineering By G.K.Pathak and D.K Chavan
3. Thermal Engineering By R.S.Khurmi