Discipline: MECHANICAL ENGG.	Semester: 3RD		Name of the Teaching Faculty: Er. AMIT KUMAR MARANDI
Subject: THERMAL ENGG-I (TH-5)	No. of days/per week class allotted: 03 Periods		Semester From date: 14/07/2025
			To date:
			No of weeks: 15
MONTH	NO. OF PERIODS	PERIODS	Theory Topics to be covered
			UNIT-I: Introduction to Thermodynamics: & Sources of Energy:
JULY	8	1	Thermodynamic Systems (closed, open, isolated) ;Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement) ; Intensive and extensive properties
		2	
		3	Define thermodynamic processes, path, cycle , state, path function, point function; Thermodynamic Equilibrium ; Quasi-static Process ; Laws of thermodynamics (statements only)
		4	
		5	Brief description of energy Sources
		6	Classification of energy sources: Renewable, Non-Renewable; Fossil fuels (CNG & LPG)
		7	Solar Energy: Flat plate and concentrating collectors & its applications (working principles of Solar Water Heater, Photovoltaic Cell, Solar Distillation)
		8	Definitions of Wind Energy; Tidal Energy; Ocean Thermal Energy; Geothermal Energy
AUGUST	2	9	Biogas, Biomass, Biodiesel; Hydraulic Energy, Nuclear Energy; Fuel cell
		10	Class Test of Chapter-1
			UNIT-2: Internal Combustion Engines:
AUGUST	9	1	Assumptions made in air standard cycle analysis;
		2	Brief description of Carnot, Otto and Diesel cycles with P-V and T-S diagrams
		3	Internal and external combustion engines; advantages of I.C. engines over external combustion engines
		4	classification of I.C. engines; neat sketch of I.C. engine indicating component parts
		5	Function of each part and materials used for the component parts - Cylinder, crank case, crank pin, crank, crank shaft, connecting rod, wrist pin, piston, cooling pins cylinder heads, exhaust valve, inlet valve
		6	Working of four-stroke and two stroke petrol and diesel engines

		7	Comparison of two stroke and four stroke engines
		8	Comparison of C.I. and S.I. engines; Valve timing and port timing diagrams for four stroke and two stroke engines
		9	Class Test of Chapter-2
			UNIT-3: I.C. Engine Systems:
AUGUST	3	1	Fuel system of Petrol engines; Principle of operation of simple and Zenith carburettors
		2	Fuel system of Diesel engines; Types of injectors and fuel pumps
		3	Cooling system: air cooling, water cooling system with thermo siphon method of circulation and water cooling system with radiator and forced circulation (description with line diagram)
SEPTEMBER	6	4	Comparison of air cooling and water cooling system
		5	Ignition systems – Battery coil ignition and magneto ignition (description and working)
		6	Comparison of two systems; Types of lubricating systems used in I.C. engines with line diagram
		7	Types of governing of I.C. engines – hit and miss method, quantitative method, qualitative method and combination methods of governing their applications
		8	Objectives of super charging
		9	Class Test of Chapter-3
			UNIT-4: Performance of I.C. Engines
SEPTEMBER	3	1	Brake power; Indicated power; Frictional power
		2	Brake and Indicated mean effective pressures
		3	Brake and Indicated thermal efficiencies
OCTOBER	6	4	Mechanical efficiency; Relative efficiency
		5	Performance test; Morse test
		6	Heat balance sheet; Methods of determination of B,P., I.P. and F.P.
		7	Simple numerical problems on performance of I.C. engines.
		8	Simple numerical problems on performance of I.C. engines
		9	Class Test of Chapter-4
			UNIT-5: Air Compressors & Refrigeration & Air-conditioning
OCTOBER	5	1	Functions of air compressor; Uses of compressed air; Types of air compressors
		2	Single stage reciprocating air compressor - its construction and working (with line diagram) using P-V diagram

		3	Multi stage compressors – Advantages over single stage compressors; Rotary compressors: Centrifugal compressor, axial flow type compressor and vane type compressors
		4	Refrigeration; Refrigerant; COP; Air Refrigeration system: components
		5	working & applications; Vapour Compression system: components, working & applications; Air conditioning
NOVEMBER	3	6	Classification of Airconditioning systems; Comfort and Industrial Air-Conditioning; Window AirConditioner
		7	Summer Air-Conditioning system, Winter Air-Conditioning system, Year-round Air-Conditioning system
		8	Class Test of Chapter-5
1			**Doubt Clearing session**
2			**Doubt Clearing session**
3			**Doubt Clearing session**

Amit
14/07/2025

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