

Lesson plan 4th semester

Subject- **THERMAL ENGINEERING-I (TH-4)**

Name of the Faculty- H.K .Panda

MONTH	MODULE/UNIT	COURSE TO BE COVERED	CLASSES REQUIRED
July	Module-1	Thermodynamic concept & Terminology	12
		Thermodynamic Systems (closed, open, isolated)	1
		Thermodynamic properties of a system (pressure, volume, temperature	2
		entropy, enthalpy, Internal energy and units of measurement).	1
		Intensive and extensive properties Define thermodynamic processes, path, cycle , state, path function, point function.	1
		Thermodynamic Equilibrium.Quasi-static Process	1
		Conceptual explanation of energy and its sources	1
		Work , heat and comparison between the two. Mechanical Equivalent of Heat.	3
		Work transfer, Displacement work	2
	Module-2	Laws of Thermodynamics	12
		State & explain Zeroth law of thermodynamics.	1
		State & explain First law of thermodynamics. Limitations of First law of thermodynamics	1
		Application of First law of Thermodynamics(steady flow energy equation and its application to turbine and compressor)	3
		Second law of thermodynamics (Clausius & Kelvin Planck statements).	2
		Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P	3
		solve simple numerical	2
	Module-3	Properties Processes of perfect gas	10
		Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law,	1
		Dalton's law of partial pressure, Guy lussac law	1
		General gas equation, characteristic gas constant, Universal gas constant.	1
		Explain specific heat of gas (Cp and Cv)Relation between Cp & Cv.	1

		Enthalpy of a gas. Work done during a non- flow process.	1
		Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)	2
		Solve simple problems on above.	2
		Free expansion & throttling process.	1
	Module-4	Internal combustion engine	8
		Explain & classify I.C engine.	1
		Terminology of I.C Engine such as bore,dead centers, stroke volume, piston speed &RPM.	1
		Explain the working principle of 2-stroke& 4- stroke engine C.I & S.I engine.	4
		Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.	2
	Module-5	Gas Power Cycle	10
		Carnot cycle	1
		Otto cycle.	2
		Diesel cycle.	2
		Dual cycle.	2
		Solve simple numerical	3
	Module-6	Fuels and Combustion	08
		Define Fuel.Types of fuel	2
		Application of different types of fuel.	2
		Heating values of fuel	2
		Quality of I.C engine fuels Octane number, Cetane number	2