LESSON PLAN-3RD SEMESTER				
Subject- **THERMAL ENGINEERING-I (TH-4)**				
Name of the Faculty- Bibatsa Panda				
MONTH	MODULE/UNIT	COURSE TO BE COVERED	CLASSES REQUIRED	REMARKS (IF ANY)
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	