Badriprasad Institute of Technology, Sambalpur

Lesson plan for Theory -4, Thermal Engineering -I

Semester & Branch : 3rd Sem Mechanical Engineering   **Total Periods-60**

Name of the faculty : Mr Pravin Kumar Pathak   **No of periods /week-4**

Week	Class	Topic
1	1	Thermodynamic concept & Terminology
	2	Thermodynamic Systems (closed, open, isolated)
	3	Thermodynamic properties of a system: pressure, volume, temperature
	4	Thermodynamic properties of a system: entropy, enthalpy, Internal energy and units of measurement
2	5	Intensive and extensive properties
	6	Thermodynamic processes, path, cycle , state, path function, point function…continue
	7	Path function, point function.
	8	Thermodynamic Equilibrium.
3	9	Quasi-static Process, Conceptual explanation of energy and its sources
	10	Work , heat and comparison between the them
	11	Mechanical Equivalent of Heat.
	12	Work transfer, Displacement work
4	13	State & explain Zeroth law of thermodynamics.
	14	State & explain First law of thermodynamics.
	15	Limitations of First law of thermodynamics
	16	Application of First law of Thermodynamics steady flow energy equation and its application to turbine
5	17	Application of First law of Thermodynamics (steady flow energy equation and its application to compressor
	18	Second law of thermodynamics Claucius & Kelvin Plank statements
	19	Application of second law in heat engine
	20	heat pump, refrigerator
6	21	determination of efficiencies & C.O.P
	22	Numerical
	23	Revesion
	24	Properties Processes of perfect gas
7	25	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law
	26	Dalton's law of partial pressure, Guy lussac law, General gas equation
	27	characteristic gas constant, Universal gas constant.
	28	Explain specific heat of gas (Cp and Cv)
8	29	Relation between Cp & Cv.
	30	Enthalpy of a gas, Work done during a non-flow process
	31	Application of first law of thermodynamics to various non flow process Isothermal, Isobaric, Isentropic and polytrophic process
	32	Solve simple problems on above.

9	33	Free expansion & throttling process.
	34	Explain & classify I.C engine…continue
	35	Classification of I.C. engine
	36	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM…continue
10	37	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM, I.C. Engine
	38	Working of 2- stroke engine C.I & S.I engine.
	39	Working of 4- stroke engine C.I & S.I engine.
	40	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine… continue
11	41	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	42	Gas Power Cycle
	43	Carnot cycle
	44	Numerical on carnot cycle
12	45	Diesel cycle
	46	Numerical on diesel cycle
	47	Otto cycle
	48	simple numerical on otto cycle
13	49	Dual cycle
	50	Numerical on dual cycle
	51	revision
	52	Class test
14	53	Fuels and Combustion
	54	Define Fuel.
	55	types of fuel
	56	Application of different types of fuel.
15	57	Heating values of fuel
	58	Quality of I.C engine fuels
	59	Octane number
	60	Cetane number.

Sign of Faculty   Sign of HOD