

### Lesson Plan

Discipline: Mechanical, Semester:3rd, Name of Faculty : SRITAM KUMAR ROUT		
Subject: THERMAL ENGINEERING-I	No. of days/ week Class allotted: 04	Semester From Date: 15.09.2022 To date : 22.12.2022
Week	Class	
1	01	INTRODUCTION TO SUBJECT
	02	Thermodynamic Systems (closed, open, isolated)
	03	Thermodynamic properties of a system (pressure, volume, temperature, entropy)
	04	Thermodynamic properties of a system ( Internal energy and units of measurement).
2	05	Intensive and extensive properties
	06	Define thermodynamic processes, path.
	07	Define thermodynamic cycle , state, path function, point function.
	08	Thermodynamic Equilibrium.
3	09	Quasi-static Process.
	10	Conceptual explanation of energy and its sources
	11	Work , heat and comparison between the two.
	12	Mechanical Equivalent of Heat.
4	13	Work transfer, Displacement work
	14	<b>Internal assessment</b>
	15	Introduction to laws of thermodynamics
	16	State & explain Zeroth law of thermodynamics.
5	17	State & explain First law of thermodynamics.
	18	Limitations of First law of thermodynamics
	19	Application of First law of Thermodynamics, steady flow energy equation
	20	application to turbine and compressor
6	21	Second law of thermodynamics (Clausius & Kelvin Plank statements).
	22	Application of second law in heat engine, heat pump, refrigerator.
	23	Determination of efficiencies & C.O.P
	24	solve simple numerical
7	25	solve simple numerical
	26	<b>Unit test 1</b>
	27	Laws of perfect gas: Boyle's law, Charles's law
	28	Avogadro's law, Dalton's law of partial pressure, Gay Lussac law
	29	General gas equation, characteristic gas constant, Universal gas constant

8	30	Explain specific heat of gas ( $C_p$ and $C_v$ )
	31	Relation between $C_p$ & $C_v$
	32	Enthalpy of a gas.
9	33	Work done during a non- flow process
	34	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric)
	35	Application of first law of thermodynamics to various non flow process (Isentropic and polytrophic process)
	36	Solve simple problems on above
10	37	Free expansion & throttling process.
	38	<b>Unit test 2</b>
	39	Introduction to ic engine
	40	Explain & classify I.C engine.
11	41	Terminology of I.C Engine such as bore, dead centers, stroke volume
	42	Terminology of I.C Engine such piston speed & RPM.
	43	Explain the working principle of 2-stroke C.I & S.I engine.
	44	Explain the working principle of 4- stroke engine C.I & S.I engine.
12	45	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	46	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	47	Carnot cycle
	48	Problem on Carnot cycle
13	49	Otto cycle.
	50	Problem on Otto cycle.
	51	Diesel cycle.
	52	Problem on Diesel cycle.
14	53	Dual cycle.
	54	Solve simple numerical.
	55	Define Fuel.
	56	Types of fuel.
15	57	Application of different types of fuel.
	58	Application of different types of fuel.
	59	Heating values of fuel.
	60	Quality of I.C engine fuels Octane number, Cetane number.
	61	<b>Unit test 3</b>
	62	Revision previous year questions

16	63	Revision previous year questions
	64	Revision previous year questions

Smitam Kumar Raut

Concerned faculty

P. R. Somantaram  
20/9/22

HOD

Govt. Polytechnic Kandhamal

20/9/22

Principal

Govt. Polytechnic Kandhamal  
Phulbani