LESSON PLAN

A)

PROGRAMME: DIPLOMA ENGINEERING	**COURSE: MECHANICAL ENGINEERING**
TEACHER NAME: Pravupada Senapaty	**SEMESTER :3rd**
SUBJECT NAME: THERMAL ENGINEERING-I	**THEORY NO: TH-4**
COURSE AREA/ DOMAIN :	**CONTACT HOURS: 62**
CORRESPONDING LAB PRACTICAL NO(IF ANY):	**LAB COURSE NAME:**

B) Course Outcomes:

At the end of the course, the students will be able to*:*

- Comprehending significance of thermodynamics properties in order to analyze a Thermodynamic system.
- Comprehending & applying first & second law of thermodynamics in closed & open system.
- Comprehending & applying gas laws applicable to perfect gas in order to determine Thermodynamic properties.
- Comprehending the concept of I.C engine and gas power cycle & computing work done & efficiency thereof.

C) Text Books:

Sl.No.	Prescribed Books	Author
1	Thermal Engineering	R.S. Khurmi
2	Thermal Engineering	A.R.Basu
3	Engineering Thermodynamics	P.k.Nag
4	Thermal Engineering	Mahesh M Rathore

D) Course Plan:

Planning				
Week No.	**Lecture No.**	**Chapter No.**	**Article(s) from the Syllabus**	**Topics to be taught (Brief Description of the title from the Prescribed Book)**
1	1	1	1.1	Thermodynamic Systems (closed, open, isolated)
	2		1.2	Thermodynamic properties of a system (pressure, volume, temperature, entropy, and units of measurement).
	3		1.2 1.3	enthalpy, Internal energy , Intensive and extensive properties
	4		1.4	Define thermodynamic processes, path, cycle, state, path function, point function.
	5		1.5	Thermodynamic Equilibrium
2	6		1.6	Quasi-static Process.
	7		1.7	Conceptual explanation of energy and its sources
	8		1.8	Work , heat and comparison between the two.
	9		1.9	Mechanical Equivalent of Heat.
	10		1.10	Work transfer, Displacement work
3	11			**REVISSION**
	12	2	2.1	State & explain Zeroth law of thermodynamics.
	13		2.2	State & explain First law of thermodynamics

3	14		2.3	Limitations of First law of thermodynamics
	15	2		solve simple numerical
4	16		2.4	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor
	17			solve simple numerical
	18		2.5	Second law of thermodynamics (Claucius statements).
	19		2.5	Second law of thermodynamics (Kelvin Plank statements).
	20			solve simple numerical
5	21		2.6	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
	22		2.6	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
	23			solve simple numerical
	24	3	3.1	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure.
	25		3.1	Laws of perfect gas: Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant.
6	26			solve simple numerical
	27		3.2 3.3	Explain specific heat of gas (Cp and Cv) Relation between Cp & Cv.
	28		3.4 3.5	Enthalpy of a gas. Work done during a non- flow process.

	29			solve simple numerical
6	30		3.6	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric process)
		3		solve simple numerical
	31		3.6	Application of first law of thermodynamics to various non flow process (Isentropic and polytrophic process)
	32			solve simple numerical
	33		3.7	Free expansion & throttling process.
7	34			**REVISSION**
	35	4	4.1	4.1 Explain & classify I.C engine.
	36		4.2	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	37		4.2	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	38		4.3	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I engine.
8	39		4.3	4.3 Explain the working principle of 2-stroke & 4- stroke engine S.I engine.
	40		4.4	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	41		4.4	Differentiate between C.I & S.I engine.
	42			**REVISSION**
9	43	5	5.1	Carnot cycle

	44			solve simple numerical
	45	5	5.2	Otto cycle.
	46			solve simple numerical
	47		5.3	Diesel cycle.
	48			solve simple numerical
10	49		5.4	5.4 Dual cycle.
	50			solve simple numerical
	51			solve simple numerical
	52			**REVISSION**
	53	6	6.1	Define Fuel.
11	54		6.2	Types of fuel.
	55		6.3	Application of different types of fuel.
	56		6.4	Heating values of fuel.
	57		6.5	Quality of I.C engine fuels Octane number, Cetane number.
	58			**REVISSION**
12	59			PREVIOUS YEAR QUESTION DISCUSSION

	60			PREVIOUS YEAR QUESTION DISCUSSION
13	**61**			PREVIOUS YEAR QUESTION DISCUSSION
13	**62**			PREVIOUS YEAR QUESTION DISCUSSION

Faculty ***HOD*** ***Academic Convener*** ***Principal***