3RD SEM 01.10.2021-08.01.2022(WINTER)

LESSON PLAN

THERMAL ENGINEERING

ER. KULADEEP MOHAPATRA

(LECTURER IN AUTOMOBILE ENGG.)

B.O.S.E.,CUTTACK

AUTOMOBILE ENGINEERING DEPATMENT

VISSION:

To develop competent, disciplined imaginative Automobile engineers, equipped with core competency and technical skills useful to the learning / teaching community and the industrial fraternity.

MISSION:

M1: To provide with operational and technical inputs to get innovative and research ideas in the field of automotive engineering.

M2: To give inputs for higher education with management qualities for the betterment of the society.

M3: Skilling with modern engineering tools necessary to meet and solve engineering problems.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To provide technical skills to diagnose and apply the concept of automotive system

PEO2: To prepare to design, fabricate and innovate in automobile sector to face the industrial challenges.

PEO3: To inculcate with good communication skills, ethics and entrepreneurship skills to play the key role in automotive industry.

Discipline:-**Automobile Engg.**	Semester :- **3rd**	Name of the teaching faculty :- **KULADEEP MOHAPATRA**
Subject Name :- **THERMAL ENGINEERING**	No. Of Days/Week Class Allotted :- **04 Periods/Week (Tuesday ,Wednessday Thursday, Friday – 1 Period Each)**	Semester from Date - **01/10/2021** To Date - **08/01/2021** **No. of Weeks: 14**
Week	**Class Day**	**Theory topics**
1st	1.10.2021	Introduction of thermal engineering **1. Thermodynamic concept & Terminology**
2nd	5.10.2021	1.1 Thermodynamic Systems (closed, open, isolated)
	7.10.2021	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement).
	8.10.2021	1.3 Intensive and extensive properties
3rd	21.10.2021	1.4 Define thermodynamic processes, path, cycle , state, path function, point function.
	22.10.2021	1.5 Thermodynamic Equilibrium. 1.6 Quasi-static Process.
4th	26.10.2021	1.7 Conceptual explanation of energy and its sources. 1.8 Work, heat and comparison between the two.
	27.10.2021	1.9 Mechanical Equivalent of Heat.
	28.10.2021	1.10 Mechanical Equivalent of Heat.
5th	2.11.2021	**Class test -1**
	3.11.2021	**2. Laws of Thermodynamics** 2.1 State & explain Zeroth law of thermodynamics.
	5.11.2021	2.2 State & explain First law of thermodynamics
6th	9.11.2021	2.3 Limitations of First law of thermodynamics
	10.11.2021	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)

	11.11.2021	2.5 Second law of thermodynamics (Claucius & Kelvin Plank statements).
	12.11.2021	2.6 Application of second law in heat engine, heat pump & determination of efficiencies.
7th	16.11.2021	2.6 Application of second law in refrigerator & determination of C.O.P (solve simple numerical)
	17.11.2021	**Class test -2**
	18.11.2021	**3. Properties Processes of perfect gas** 3.1 Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law
8th	23.11.2021	3.1 Dalton's law of partial pressure, Guy lussac law, General gas equation
	24.11.2021	3.1 characteristic gas constant, Universal gas constant
	25.11.2021	3.2 Explain specific heat of gas (Cp and Cv)
	26.11.2021	3.3 Relation between Cp & Cv. 3.4 Enthalpy of a gas
9th	30.11.2021	3.5 Work done during a non- flow process
	1.12.2021	3.6 Application of first law of thermodynamics to various non-flow process (Isothermal, Isobaric, Isentropic and polytrophic process)
	2.12.2021	3.6 Solve simple problems on above.
	3.12.2021	3.7 free expansion & throttling process.
10th	7.12.2021	**INTERNAL ASSESSMENT**
	8.12.2021	**4.Internal combustion engine** 4.1 Explain & classify I.C engine.
	9.12.2021	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	10.12.2021	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
11th	14.12.2021	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	15.12.2021	Class test -3
	16.12.2021	**5. Gas Power Cycle** 5.1 Carnot cycle
	17.12.2021	5.2 Otto cycle.
12th	21.12.2021	5.3 Diesel cycle.
	22.12.2021	5.4 Dual cycle.

	23.12.2021	5.5 Solve simple numerical.
	24.12.2021	6. Fuels and Combustion
13th	28.12.2021	**Class test – 4**
	29.12.2021	**6. Fuels and Combustion** 6.1 Define Fuel.
	30.12.2021	6.2 Types of fuel.
	31.12.2021	6.3 Application of different types of fuel.
14th	4.1.2022	6.4 Heating values of fuel.
	5.1.2022	6.5 Quality of I.C engine fuels Octane number, Cetane number.
	6.1.2022	**Mock test- 1**
	7.1.2022	**Mock test- 2**