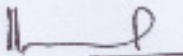


Discipline:- MECHANICAL ENGG.	Semester :-3 rd	Name of the Teaching Faculty: - Dr. LALATENTU DASH
Subject:- THERMAL ENGINEERING-I (TH-4)	No. of days/per week class allotted:- 04	Semester From date: - 01.08.2023 To Date: 30.11.2023 No. of Weeks:- 15
Week	Class Day	Theory Topics
1ST	1ST	1. Thermodynamic concept & Terminology 1.1 Thermodynamic Systems (closed, open, isolated)
	2ND	1.2 Thermodynamic properties of a system pressure, volume, temperature, entropy, enthalpy,
	3RD	Internal energy and units of measurement
	4TH	1.3 Intensive and extensive properties
2ND	1ST	1.4 Define thermodynamic processes, path, cycle ,
	2ND	State, path function, point function
	3RD	1.5 Thermodynamic Equilibrium.
	4TH	1.6 Quasi-static Process.
3RD	1ST	1.7 Conceptual explanation of energy and its sources
	2ND	1.8 Work , heat and comparison between the two
	3RD	1.9 Mechanical Equivalent of Heat.
	4TH	1.10 Work transfer, Displacement work
4TH	1ST	2. Laws of Thermodynamics 2.1 State & explain Zeroth law of thermodynamics.
	2ND	2.2 State & explain First law of thermodynamics.
	3RD	2.2 State & explain First law of thermodynamics. Limitations of First law of thermodynamics
	4TH	2.3 Limitations of First law of thermodynamics
5TH	1ST	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine)
	2ND	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to compressor)
	3RD	2.5 Second law of thermodynamics (Claucius & Kelvin Plank Statements).
	4TH	2.5 Second law of thermodynamics (Claucius & Kelvin Plank Statements).
6TH	1ST	2.6 Application of second law in heat engine, heat pump, refrigerator
	2ND	Determination of efficiencies & C.O.P
	3RD	Solve simple numerical
	4TH	CLASS TEST
7TH	1ST	3. Properties Processes of perfect gas 3.Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law.
	2ND	General gas equation, characteristic gas constant, Universal gas constant.
	3RD	Solve simple numerical
	4TH	3.3 Explain specific heat of gas (Cp and Cv),Relation between Cp&Cv

8 TH	1 ST	3.4 Enthalpy of a gas.
	2 ND	3.5 Work done during a non- flow process.
	3 RD	3.6 Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytropic process)
	4 TH	Solve simple problems on above.
9 TH	1 ST	CLASS TEST
	2 ND	3.7 Free expansion & throttling process
	3 RD	4. Internal combustion engine 4.1 Explain & classify I.C engine.
	4 TH	4.2 Terminology of I.C Engine such as bore, dead centers, stroke Volume, piston speed & RPM.
10 TH	1 ST	4.3 Explain the working principle of 2-stroke S.I engine
	2 ND	4.3 Explain the working principle of 2-stroke C.I engine
	3 RD	4.3 Explain the working principle of 4- stroke engine S.I engine
	4 TH	4.3 Explain the working principle 4- stroke engine C.I engine
11 TH	1 ST	4.4 Differentiate between 2-stroke & 4- stroke engine
	2 ND	4.4 Differentiate between C.I & S.I engine
	3 RD	5. Gas Power Cycle 5.1 Carnot cycle
	4 TH	Solve simple numerical
12 TH	1 ST	5.2 Otto cycle
	2 ND	Solve simple numerical
	3 RD	5.3 Diesel cycle.
	4 TH	Solve simple numerical
13 TH	1 ST	5.4 Dual cycle
	2 ND	5.5 Solve simple numerical
	3 RD	5.5 Solve simple numerical
	4 TH	CLASS TEST
14 TH	1 ST	6. Fuels and Combustion 6.1 Define Fuel.
	2 ND	6.2 Types of fuel.
	3 RD	6.3 Application of different types of fuel.
	4 TH	6.3 Application of different types of fuel.
15 TH	1 ST	6.4 Heating values of fuel.
	2 ND	6.5 Quality of I.C engine fuels Octane number, Cetane number.
	3 RD	6.5 Quality of I.C engine fuels Octane number, Cetane number.
	4 TH	6.5 Quality of I.C engine fuels Octane number, Cetane number.

Learning Resources:

01. Thermal Engineering, by R.S.Khurmi, S.Chand pub.
02. Thermal Engineering by A.R.Basu, Dhanpat Rai & Co.
03. Thermal Engineering, by A.S.Sarao, Satya Prakash
04. Engineering Thermodynamic, by P.K.Nag, TMH
05. Thermal Engineering by Mahesh M Rathore, TMH


28/7/23

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