

TH4

Discipline :MECHANICALENGG	Semester 3 rd	Name of the Teaching Faculty: MUKESH KUMAR DALEL
Subject: THERMAL ENGINEERING-I	No. of days/per week class allotted: 04	Semester From date : 16.8.24 To Date: 16.12.24 No. of Weeks: 15
Week	Class Day	Theory / Practical Topics
1 ST	1 ST	Thermodynamic Systems (closed, open, isolated) enthalpy, Internal energy and units of measurement).
	2 ND	Thermodynamic properties of a system (pressure, volume, temperature, entropy,
	3 RD	Thermodynamic properties of a system (pressure, volume, temperature, entropy,
	4 TH	Intensive and extensive properties
2 ND	1 ST	Define thermodynamic processes, path, cycle, state, path function, point function
	2 ND	Define thermodynamic processes, path, cycle, state, path function, point function
	3 RD	Thermodynamic Equilibrium.
	4 TH	Quasi-static Process.
3 RD	1 ST	Conceptual explanation of energy and its sources
	2 ND	Work, heat and comparison between the two
	3 RD	Mechanical Equivalent of Heat.
	4 TH	Work transfer, Displacement work
4 TH	1 ST	State & explain Zeroth law of thermodynamics.
	2 ND	State & explain First law of thermodynamics.
	3 RD	Limitations of First law of thermodynamics
	4 TH	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
5 TH	1 ST	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
	2 ND	Second law of thermodynamics (Clausius & Kelvin Plank statements).
	3 RD	Second law of thermodynamics (Clausius & Kelvin Plank statements).
	4 TH	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
6 TH	1 ST	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	2 ND	(solve simple numerical)
	3 RD	(solve simple numerical)
	4 TH	(solve simple numerical)
7 TH	1 ST	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant.
	2 ND	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant.

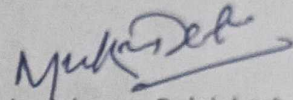
	3 RD	Explain specific heat of gas (C_p and C_v)
	4 TH	Relation between C_p & C_v
8 TH	1 ST	Enthalpy of a gas.
	2 ND	Work done during a non- flow process.
	3 RD	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytropic process)
	4 TH	Solve simple problems on above.
9 TH	1 ST	Solve simple problems on above.
	2 ND	Free expansion & throttling process
	3 RD	Explain & classify I.C engine.
	4 TH	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
10 TH	1 ST	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
	2 ND	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine
	3 RD	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine
	4 TH	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine
11 TH	1 ST	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine
	2 ND	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine
	3 RD	Carnot cycle
	4 TH	Otto cycle
12 TH	1 ST	Diesel cycle.
	2 ND	Dual cycle
	3 RD	Solve simple numerical
	4 TH	Solve simple numerical
13 TH	1 ST	Solve simple numerical
	2 ND	Solve simple numerical
	3 RD	Solve simple numerical
	4 TH	Solve simple numerical
14 TH	1 ST	Define Fuel.
	2 ND	Types of fuel.
	3 RD	Application of different types of fuel.
	4 TH	Application of different types of fuel.
15 TH	1 ST	Heating values of fuel.
	2 ND	Quality of I.C engine fuels Octane number, Cetane number.
	3 RD	Quality of I.C engine fuels Octane number, Cetane number.
	4 TH	Quality of I.C engine fuels Octane number, Cetane number.

Learning Resources:

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



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