

Discipline : MECHANICALENGG	Semester : 3rd	Name of the Teaching Faculty: MITHUN KUMAR KESHARI
Subject: THERMAL ENGINEERING-I	No. of days/per week class allotted: 04	Semester From date : 01.09.2020 To Date: 19.03.2021 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 Planck statements).
	3 RD	Second law of thermodynamics (Clausius & Kelvin Planck 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 (Cp and Cv)
	4 TH	Relation between Cp&Cv
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 polytrophic 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 Resouces:

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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