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

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

Learning Resouces:

01. Thermal Engineering, byR.S.Khurmi,S.Chand
02. Thermal EngineeringbyA.R.Basu, DhanpatRai
03. Thermal Engineering, byA.S.Sarao, Satya Prakash
04. Engineering Thermodynamics,byP.K.Nag, TMH
05. Thermal Engineeringby Mahesh M Rathore,TMH