

Discipline: Mechanical Engineering	Semester : 3 rd Semester-2020-21	Name of the Teaching Faculty: Shri SHEKHAR KUMAR SAHU, PTGF in Mechanical Engineering
Subject: Thermal Engineering 1	No. of Days/week Class Allotted:60	Semester from date: 01/09 / 2020 to date: 19/03/2021 No of weeks: 18
week	Class Day	Theory Topics
1st	1st	Thermodynamic Systems (closed, open, isolated)
	2nd	Thermodynamic properties of a system (pressure, volume, temperature)
	3rd	Thermodynamic properties of a system (enthalpy, Internal energy and units of measurement).
	4th	Intensive and extensive properties
2nd	1st	Define thermodynamic processes, path, cycle, state, path function, point function.
	2nd	Thermodynamic Equilibrium.
	3rd	Quasi-static Process.
	4th	Conceptual explanation of energy and its sources
3rd	1st	Work, heat and comparison between the two.
	2nd	Mechanical Equivalent of Heat.
	3rd	Work transfer, Displacement work
	4th	State & explain Zeroth law of thermodynamics.
4th	1st	State & explain First law of thermodynamics.
	2nd	Limitations of First law of thermodynamics
	3rd	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
	4th	Second law of thermodynamics (Claucius & Kelvin Plank statements).
5th	1st	Application of second law in heat engine, heat pump refrigerator
	2nd	Determination of efficiencies of heat engine
	3rd	Determination of C.O.P of Heat pump
	4th	Determination C.O.P of Refrigerator (solve simple numerical)
6th	1st	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure
	2nd	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.
7th	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).

	4 th	Solve simple problems on work done in Isothermal process	
8 th	1 st	Solve simple problems on work done in Isobaric process	
	2 nd	Solve simple problems on work done in Isentropic process	
	3 rd	Solve simple problems on work done in polytropic process	
	4 th	Free expansion & throttling process.	
9 th	1 st	Explain & classify I.C engine.	
	2 nd	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.	
	3 rd	Explain the working principle of 2-stroke engine.	
	4 th	Explain the working principle of 4-stroke engine.	
10 th	1 st	Differentiate between 2-stroke & 4- stroke engine	
	2 nd	Explain the working principle of CI engine.	
	3 rd	Explain the working principle of SI engine.	
	4 th	Differentiate between 2-stroke & 4- stroke engine	
11 th	1 st	Carnot cycle	
	2 nd	Otto cycle	
	3 rd	Simple problems on Otto cycle	
	4 th	Diesel Cycle	
12 th	1 st	Simple problem on Diesel Cycle	
	2 nd	Dual cycle	
	3 rd	Simple problems on dual cycle	
	4 th	Comparison between Otto , Diesle and Dual cycle	
13 th	1 st	Defination of Fuel	
	2 nd	Types of fuel	
	3 rd	Application of different types of fuel.	
	4 th	Heating values of fuel.	
14 th	1 st		
	2 nd		
	3 rd		
	4 th		
15 th	1 st		
	2 nd		
	3 rd		
	4 th		
16 th	1 st		

17 th	1 st		
	2 nd		
	3 rd		
	4 th		
18 th	1 st		
	2 nd		
	3 rd		
	4 th		