

Samrat Ashok Technological Institute, Vidisha

Department of Mechanical Engineering

Lecture Plan

Course Code:	MEC 231	Year/Semester :	BE II nd Year/ 3 rd Semester
Course Name:	Fundamentals of Thermodynamics	Academic Year :	August-2023 / ODD
L – P:	3 – 0	Credit :	3
Course Detail :	Theory	Term Start Date :	01-08-2023
Course Coordinator:	Dr. N. S. Raghuvanshi	Term End Date :	03-11-2023

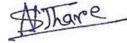
Academic Year: 2023

Name of Teacher: Dr. N. S. Raghuvanshi

Subject: Fundamentals of Thermodynamics

Theory/Tutorial: Theory

Sr. No.	Name Of Unit/Topics	Hrs. Allotted	Actual Date	Teaching Aid Code	Remarks
	Unit: 1- Basic Concepts:				
01	Thermodynamic system, Property, Equilibrium, State, Process, Cycle	1		1,4	
	Zeroth Law of thermodynamics, statement and significance, Heat and work transfer	2		1,4	
	Statement of first law applied to a closed system undergoing a cycle and processes, analysis of closed system	2		1,4	
	Flow process, flow energy, steady flow process, relations for flow processes	2		1,4	
	Limitations of first law of thermodynamics	1		1,4	
	Unit: 2- Second law of thermodynamics:				
02	Heat engine, heat reservoir, refrigerator, heat pump, COP, EPR	1		1,4	
	Carnot's theorem, Carnot's cycle, efficiency of Carnot's cycle	2		1,4	
	Statement of second law reversible and irreversible processes, consequence of second law	2		1,4	
	Entropy, Entropy change for ideal gas, T-S diagrams	2		1,4	
	Availability and Irreversibility	1		1,4	
	Unit: 3- Concept of an ideal gas:				
03	Gas laws, Avogadro's hypothesis, Real Gas, Deviation with ideal gas	2		1,4	
	Vander-wall's equation, evaluation of its constants, limitations of the Vander-wall's equation	2		1,4	
	The law of corresponding states, compressibility factor, generalized compressibility chart, P-V-T surface of a real gas	2		1,4	
	Non reactive gas mixture, PVT relationship, mixture of ideal gases	1		1,4	
	Properties of mixture of ideal gases, internal energy, enthalpy and specific heat of gas mixtures	1		1,4	

04	Unit: 4- Pure substances:				
	Phase, phase-transformations	1		1,4	
	Formation of steam, properties of steam	2		1,4	
	PVT surface, HS, TS, PV, PH, TV diagram	2		1,4	
	Processes of vapor measurement of dryness fraction	2		1,4	
	Use of steam table and mollier chart	1		1,4	
05	Unit: 5- Thermodynamics Relations:				
	Gibb's function, Helmholtz function,	1		1,4	
	Maxwell relations, and their applications	2		1,4	
	TdS equations , Relationship between specific heats	2		1,4	
	Clapeyron equations, Joule-Thomson coefficient	2		1,4	
	Coefficient of volume expansion, adiabatic and isothermal compressibilities	1		1,4	
Teaching Aid Code:		Sign of Teacher: 			
1	White board				
2	L.C.D/overhead PROJECTOR				
3	MODEL & CHART				
4	PPT & VIDEO				
LESSON PLANNING, Rev. no. :					

Reference Books:

1. P. K. Nag; Engineering Thermodynamics, Mc Graw Hills
2. Cengel Y; Thermodynamics: An Engineering Approach; Mc Graw Hills
3. Arora CP Thermodynamics, Mc Graw Hills