PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY, PANIPAT
DEPARTMENT OF MECHANICAL ENGINEERING
COURSE PLAN

Faculty Name: - Dr. Vishal Dabra **Subject Name: - Thermodynamics**
Year/Semester: 3rd **Subject Code: - MEC-205A**

Sr No.	Lecture No.	Topics To Be Covered	Tentative date	Remarks
1	L1	**Unit-1: Basic Concepts:** Thermodynamics: Macroscopic and Microscopic Approach,	31/08/2021	
2	L2	Thermodynamic Systems, Surrounding and Boundary, Thermodynamic Property – Intensive and Extensive,	2/09/2021	
3	L3	Thermodynamic Equilibrium, State, Path, Process and Cycle	3/09/2021	
4	L4	Quasi-static, Reversible and Irreversible Processes, Working Substance.	6/09/2021	
5	L5	Concept of Thermodynamic Work and Heat, Zeroth Law of Thermodynamic and its utility	9/09/2021	
6	L6	**First Law of Thermodynamics:** Energy and its Forms,	10/09/2021	
7	L7	Energy and 1st law of Thermodynamics, Internal Energy and Enthalpy,	13/09/2021	
8	L8	1st Law Applied to Non-Flow Process,	16/09/2021	
9	L9	Steady Flow Process and Transient Flow Process,	17/09/2021	
10	L10	Throttling Process and Free Expansion Process.	20/09/2021	
11	L11	**UNIT-II: Second Law of Thermodynamics:** Limitations of First Law	23/09/2021	
12	L12	Thermal Reservoir Heat Source and Heat	24/09/2021	

		Sink, Heat Engine, Refrigerator and Heat Pump		
13	L13	Kelvin- Planck and Clausius Statements and Their Equivalence,	27/09/2021	
14	L14	Perpetual Motion Machine of Second Kind.	30/09/2021	
15	L15	Carnot Cycle, Carnot Heat Engine and Carnot Heat Pump	1/10/2021	
16	L16	Carnot's Theorem and its Corollaries,	4/10/2021	
17	L17	Thermodynamic Temperature Scale, Numerical	7/10/2021	
18	L18	**Entropy:**Clausius Inequality and Entropy, Principle of Entropy Increase	8/10/2021	
19	L19	Temperature-Entropy Plot, Entropy Change in Different Processes,	11/10/2021	
20	L20	Introduction to Third Law of thermodynamics.	18/10/2021	
21	L21	**Unit-III Availability, Irreversibility and Equilibrium:** High and Low Grade Energy, Available Energy and Unavailable Energy,	21/10/2021	
22	L22	Loss of Available Energy Due to Heat Transfer Through a Finite Temperature Difference	22/10/2021	
23	L23	Availability of a Non-Flow or Closed System,	25/10/2021	
24	L24	Availability of a Steady Flow System,	28/10/2021	
25	L25	Helmholtz and Gibb's Functions, Effectiveness and Irreversibility	29/10/2021	
26	L26	**Pure Substance:** Pure Substance and its Properties, Phase and Phase Transformation	1/11/2021	
27	L27	Vaporization, Evaporation and Boiling , Saturated and Superheated Steam	8/11/2021	
28	L28	Solid – Liquid – Vapour Equilibrium, T-V, P-V and P-T Plots During Steam Formation	11/11/2021	

29	L29	Properties of Dry, Wet and Superheated Steam, Property Changes During Steam Processes,	12/11/2021	
30	L30	Temperature – Entropy (T-S) and Enthalpy – Entropy (H-S) Diagrams, Throttling and Measurement of Dryness Fraction of Steam.	25/11/2021	
31	L31	**UNIT-IV: Thermodynamic Relations:** TDS Relations	26/11/2021	
32	L32	Enthalpy and Internal Energy as a Function of Independent Variables	29/11/2021	
33	L33	Specific Heat Capacity Relations	2/12/2021	
34	L34	Clapeyron Equation	3/12/2021	
35	L35	Maxwell Relations.	6/12/2021	
36	L36	**Gas Power Cycles:** Air standard efficiency	9/12/2021	
37	L37	Otto cycle	10/12/2021	
38	L38	Diesel cycle	16/12/2021	
39	L39	Dual cycle	17/12/2021	
40	L40	Atkinson cycle	20/12/2021	
41	L41	Stirling and Ericsson cycles	23/12/2021	
42	L42	Brayton or Joule cycle, Lenoir cycle	24/12/2021	

Text Books:

1. Thermal Engineering – P L Ballaney, Khanna Publishers.
2. Thermodynamics and Heat Engines vol II – R Yadav, Central Publishing House
3. Engineering Thermodynamics Work and Heat Transfer - G. F. C Rogers and Y. R. Mayhew, Pearson.

Reference Books:

1. Thermodynamics An Engineering Approach-Yunus A Cengel and Michael A Boles TMH
2. Applied Thermodynamics for Engineering Technologists – T D Eastop and A. McConkey, Pearson Education
3. Heat Engineering – V P Vasandani and D S Kumar, Metropolitan Book Co Pvt Ltd.