

Name of Faculty Sachin Jasuja  
 Discipline Mechatronics Engineering  
 Semester 3rd  
 Subject MT-205 Thermal Engineering  
 Lesson Plan Duration 15 Weeks  
 Work Load (Lecture) per week: Lecture 3

Week	Theory	
	Lecture Day	Topic
1	1	Basic Concepts: Thermodynamics: Macroscopic and Microscopic Approach, Thermodynamic Systems, Surrounding and Boundary,
	2	Thermodynamic Property – Intensive and Extensive
	3	Thermodynamic Equilibrium, State, Path, Process and Cycle, Quasi-static, Reversible and Irreversible Processes
2	4	Working Substance. Concept of Thermodynamic Work and Heat, Equality of Temperature
	5	Zeroth Law of Thermodynamic and its utility
	6	Ideal and Real Gases: Concept of an Ideal Gas, Basic Gas Laws
3	7	Characteristic Gas Equation, Avagadro's law and
	8	Universal Gas Constant, P-V-T surface of an Ideal Gas
	9	Vander Waal's Equation of state, Reduced Co-ordinates,
4	10	Compressibility factor and law of corresponding states
	11	Mixture of Gases, Mass, Mole and Volume Fraction, Gibson Dalton's law,
	12	Gas Constant and specific Heats, Entropy for a mixture of Gases
5	13	Test
	14	First Law of Thermodynamics: Energy and its Forms,
	15	Energy and 1st law of Thermodynamics,
6	16	Internal Energy and Enthalpy
	17	1st Law Applied to Non-Flow Process,
	18	Steady Flow Process and Transient Flow Process,
7	19	Throttling Process and Free Expansion Process. Numerical
	20	Second Law of Thermodynamics: Limitations of First Law
	21	Thermal Reservoir Heat Source and Heat Sink,
8	22	Heat Engine, Refrigerator and Heat Pump
	23	Kelvin- Planck and Clausius Statements and Their Equivalence,
	24	Perpetual Motion Machine of Second Kind.
9	25	Carnot Cycle, Carnot Heat Engine and Carnot Heat Pump,
	26	Carnot's Theorem and its Corollaries,
	27	Thermodynamic Temperature Scale, Numericals
10	28	Entropy: Clausius Inequality and Entropy,

	29	Principle of Entropy Increase, Temperature Entropy Plot,
	30	Entropy Change in Different Processes,
11	31	Introduction to Third Law of thermodynamics. Availability,
	32	Irreversibility and Equilibrium: High and Low Grade Energy,
	33	Availability and Unavailable Energy,
12	34	Loss of Available Energy Due to Heat Transfer Through a Finite Temperature Difference
	35	TEST
	36	Pure Substance: Pure Substance and its Properties,
13	37	Phase and Phase Transformation, Vaporization,
	38	Evaporation and Boiling, Saturated and Superheated Steam
	39	Solid – Liquid – Vapour Equilibrium,
14	40	T-V, P-V and P-T Plots During Steam Formation,
	41	Properties of Dry, Wet and Superheated Steam
	42	Property Changes During Steam Processes,
15	43	Temperature – Entropy (T-S) and Enthalpy – Entropy (H-S) Diagrams
	44	Throttling and Measurement of Dryness Fraction of Steam. Numericals.
	45	TEST