Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Ajay Kumar
Discipline : Mechanical Engineering
Semester : 3rd
Subject : Thermodynamics (MEC-205 A)
Lesson Plan Duration : 15 weeks (from October 2021 to January 2022)
Work Load : L 3 T 1 P 0

Week	Theory	
	Lecture day	Topic (including assignment/ test)
1st	1	Basic Concepts: Thermodynamics: Macroscopic and Microscopic Approach
	2	Thermodynamic Systems, Surrounding and Boundary,
	3	Thermodynamic Property – Intensive and Extensive, Thermodynamic Equilibrium, State, Path, Process and Cycle, Quasi-static
	Tutorial	Numerical Problem
2nd	1	Reversible and Irreversible Processes, Working Substance.
	2	Concept of Thermodynamic Work and Heat
	3	Concept of Thermodynamic Work and Heat contd..,
	Tutorial	Numerical Problem
3rd	1	Equality of Temperature, Zeroth Law of Thermodynamic and its utility.
	2	First Law of Thermodynamics: Energy and its Forms
	3	Energy and 1st law of Thermodynamics, Internal Energy and Enthalpy, 1st Law Applied to Non-Flow Process
	Tutorial	Steady Flow Process and Transient Flow Process.
4th	1	Numerical Problem
	2	Throttling Process and Free Expansion Process.
	3	Second Law Of Thermodynamics: Limitations of First Law, Thermal Reservoir Heat Source and Heat Sink, Heat Engine, Refrigerator and Heat Pump
	Tutorial	Kelvin- Planck and Clausius Statements and Their Equivalence, Perpetual Motion Machine of Second Kind
5th	1	Numerical Problem
	2	Carnot Cycle, Carnot Heat Engine and Carnot Heat Pump, Carnot's Theorem and its Corollaries
	3	Numerical Problem
	Tutorial	Numerical Problem
6th	1	Entropy: Clausius Inequality and Entropy, Principle of Entropy Increase
	2	Temperature Entropy Plot, Entropy Change in Different Processes
	3	Numerical Problem
	Tutorial	Numerical Problem
7th	1	Introduction to Third Law of Thermodynamics.
	2	Availability, Irreversibility and Equilibrium: High and Low Grade Energy
	3	Availability and Unavailable Energy, Loss of Available Energy Due to Heat Transfer Through a Finite Temperature Difference
	Tutorial	Numerical Problem

8th	**1**	Numerical Problem
	2	Availability of a Non-Flow or Closed System
	3	Availability of a Steady Flow System
	Tutorial	Helmholtz and Gibb's Functions, Effectiveness and Irreversibility
9th	**1**	Numerical Problem
	2	Numerical Problem
	3	Numerical Problem
	Tutorial	Numerical Problem
10th	**1**	Pure Substance: Pure Substance and its Properties, Phase and Phase Transformation, Vaporization, Evaporation and Boiling
	2	Saturated and Superheat Steam, Solid – Liquid – Vapor Equilibrium
	3	Numerical Problem
	Tutorial	Pure Substance: Pure Substance and its Properties, Phase and Phase Transformation, Vaporization, Evaporation and Boiling
11th	**1**	Numerical Problem
	2	T-V Plot During Steam Formation
	3	P-V Plot During Steam Formation
	Tutorial	P-T Plot During Steam Formation
12th	**1**	Numerical Problem
	2	Properties of Dry, Wet and Superheated Steam,
	3	Numerical Problem
	Tutorial	Numerical Problem
13th	**1**	Numerical Problem
	2	Property Changes During Steam Processes Temperature – Entropy (T-S) Diagram, Enthalpy – Entropy (H-S) Diagrams, Numerical Problem
	3	Throttling and Measurement of Dryness Fraction of Steam. Numerical Problem
	Tutorial	Thermodynamic Relations: T-Ds Maxwell Relations.
14th	**1**	Numerical Problem
	2	Relations, Enthalpy and Internal Energy as a Function of Independent Variables , Specific Heat Capacity Relations, Clapeyron Equation,
	3	Carnot Cycle, Otto Cycle, Numerical Problem
	Tutorial	Diesel Cycle , Numerical Problem
15th	**1**	Numerical Problem
	2	Dual Cycle
	3	Stirling Cycle, Atkinston cyle
	Tutorial	Lenior cycle , Problem on Dual Cycle

(Signature of the teacher concerned with date)