LESSON PLAN OF CHEMICAL ENGINEERING DEPARTMENT WINTER 2021

Discipline: Chemical	Semester: 5th	Name of Faculty: Sanjukta Nayak	
Subject: Theory-4 Chemical Engineering Thermodynamics	No of Days per week class allotted:4	Semester From: 01 October 2021 To 08 January 2022	
Week	**Class days**	**Chapter**	**Theory Topic**
1st	1st – 1	1.1	Introduction to thermodynamics and basic concept.
	2nd -2	1.1	Scope and limitations of Thermodynamics
	3rd -3	1.2	To define System, processes, state
	4th -4	1.2	To define properties, state and path function
2nd	1st – 5	1.2	Concept of heat and work
	2nd -6	1.3	Equilibrium state and phases
	3rd -7	1.4	Zeroth law of Thermodynamics
	4th -8	1.5	The concept of heat reservoir, heat engine, and heat pump.
3rd	1st – 9	1.5	Solve simple problem on heat engine and heat pump
	2nd -10	1.6	Reversible and irreversible process
	3rd -11	1.7	Solve simple problems
	4th -12	2.1	State and explain first law of Thermodynamics
4th	1st – 13	2.2	Concept of internal energy
	2nd -14	2.2	Define Enthalpy, heat capacity
	3rd -15	2.3	First law of thermodynamics for cyclic process
	4th -16	2.3	First law of thermodynamics for non-flow process
5th	1st – 17	2.3	First law of thermodynamics for flow process
	2nd -18	2.4	Solve numerical on application of 1ST law of thermodynamics
	3rd -19	2.4	Solve numerical on application of 1ST law of thermodynamics
	4th -20	3.1	P-V-T behavior of pure fluid
6th	1st – 21	3.2	Equation of state and ideal gas
	2nd -22	3.2	Equation of state and ideal gas
	3rd -23	3.3	constant temperature process
7th	1st – 25	3.3	Adiabatic process for ideal gas
	2nd -26	3.3	Constant volume process for ideal gas

	3rd -27	3.3	constant pressure process for ideal gas
	4th-28	3.3	Exam Related to chapter1 and chapter 2
8th	1st – 29	3.3	Numerical based on heat effect
	2nd -30	4.1	State and explain second law of thermodynamics
	3rd -31	4.1	Application of second law of thermodynamics
	4th -32	4.2	Concept of entropy.
9th	1st – 33	4.2	Numerical based on second law of thermodynamics and entropy
	2nd -34	4.3	Calculate change of entropy for various conditions
	3rd -35	4.4	Third law of Thermodynamics
	4th -36	4.4	Numerical based on third law of thermodynamics
10th	1st – 37	5.1	Introduction to thermodynamic properties of pure fluid
	2nd -38	5.1	Classify thermodynamic properties
	3rd -39	5.2	Work function and Gibb's free energy and Gibb's phase rule.
	4th -40	5.3	Various relationships among thermodynamic properties
11th	1st – 41	5.3	Concept of Maxwell equation, clapeyron equation
	2nd -42	5.3	Concept of entropy-heat capacity relation
	3rd -43	5.3	Differential equation for entropy
	4th -44	5.3	Effect of temperature, pressure and volume on U,H and S, relationship between C_p and C_v
12th	1st – 45	5.3	Numerical on Maxwell equation, clapeyron equation, C_p and C_v
	2nd -46	5.4	Gibb's-Helmhaltz equation.
	3rd -47	5.5	Fugacity co-efficient, effect of temperature on fugacity
	4th -48	5.5	Effect of pressure on fugacity
13th	1st – 49	5.5	Fugacity of pure gases, solids and liquids
	2nd -50	5.6	Concept of activity on activity
	3rd -51	5.6	Effect of pressure and temperature on activity
	4th -52	5.6	Effect of pressure and temperature on activity
14th	1st – 53	5.7	Concept of Refrigeration and liquefaction process
	2nd -54	5.7	Concept of liquefaction process
	3rd -55	5.7	Solve numerical on properties of fluid
	4th -56	1	Revision of chapter 1
15th	1st – 57	2	Revision of chapter 2
	2nd -58	3	Revision of chapter 3

	3rd -59	4	Revision of chapter 4
	4th -60	5	Revision of chapter 5