UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SUBJECT-CHEMICAL ENGINEERING THERMODYNAMICS

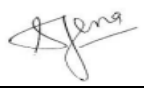
PREPARED BY- SUBASINI JENA
DEPARTMENT OF CHEMICAL ENGINEERING

	Topics covered
WEEK 1	Scope and limitations of Thermodynamics
	System, processes, state and path function heat and work
	Properties of Thermodynamics
	Equilibrium state and phases
WEEK 2	Zeroth law of Thermodynamics
	The concept of heat reservoir
	The concept of heat engine
WEEK 3	The concept of heat pump
	Reversible and irreversible process
	Solve simple problems
WEEK 4	State and explain first law of Thermodynamics
	Concept of internal energy
	Solve numerical on 1^{ST} law of thermodynamics
	Concept of Enthalpy
WEEK 5	Solve numerical on 1^{ST} law of thermodynamics
	Concept of heat capacity
	Solve numerical on 1^{ST} law of thermodynamics
	Solve numerical on application of 1ST law of thermodynamics
WEEK 6	First law of thermodynamics for cyclic process
	First law of thermodynamics for non-flow process
	First law of flow process cyclic
	Solve numerical on application of 1ST law of thermodynamics
WEEK 7	Quiz test
	Doubt clearing class
	Concept of P-V-T behavior of pure fluid
WEEK 8	Problems on P-V-T behavior of pure fluid
	Equation of state and ideal gas

	Constant volume process
WEEK 9	constant pressure process
	constant temperature process
	Adiabatic process
WEEK 10	polytrophic process for ideal gases
	Problems on Constant volume process
	Problems on constant pressure process
WEEK 11	Problems on constant temperature process
	Problems on Adiabatic process
	Doubt clearing class
WEEK 12	State and explain second law of thermodynamics
	Problems on second law of thermodynamics
	Concept of entropy
	Problems on entropy
WEEK 13	Doubt clearing class
	Calculate change of entropy for various conditions
	Third law of Thermodynamics
WEEK 14	Classify thermodynamic properties
	Work function and Gibb's free energy and Gibb's phase rule
	Problems on free energy
	Various relationships among thermodynamic properties – Maxwell equation
WEEK 15	Various relationships among thermodynamic properties – Maxwell equation
	clapeyron equation
	Derivation on clapeyron equation
	Revision class
WEEK 16	Entropy-heat capacity relation
	Effect of temperature, pressure and volume on U,H and S,
	Differential equation for entropy
	relationship between Cp and Cv
WEEK 17	Gibb's-Helmholtz equation
	Fugacity co-efficient, effect of temperature and pressure on fugacity, fugacity of pure gases, solids and liquids
	Concept of activity, Effect of pressure and temperature on activity
	Concept of Refrigeration and liquefaction process

BOOKS FOR REFERENCE:

- A text book of chemical engineering Thermodynamics by K V Narayanan,
- Modern Introduction to chemical Engineering Thermodynamics, Tata Mc Grawhill.

	Prepared by	**Approved by**
Signature		
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