

CO1: To understand concept of thermodynamics & first law of thermodynamics.

LO1: To understand basic concept of thermodynamics
 content: Basic concept, scope of thermodynamics
 Thermodynamic ~~the~~ system and its surrounding
 system properties, system states, and process
 state. Fundamental, postulates and their
 relationship of three law of classical
~~thermo~~ thermodynamics.

method of assessment: End Sem Theory External
 hrs - 5 marks: 5

LO2: To learn application of first law of thermodynamics

content: First law of thermodynamics, application
 to simple situation, mathematical equation
 for first law of thermodynamics of open
 system and steady state flow process
 Enthalpy its definition and concept of
 enthalpy.

Method of assessment: End Sem Theory External
 hrs - 10 marks - 10

LO3: To distinguish heat, work and functions.

content: Definition of heat and work, difference
 between heat and work, Internal energy
 Extensive and intensive properties

state and path function definition, difference between state and path functions

method of assessment: End Sem Theory Internal
hrs - 10, marks - 10

CO2: To understand volumetric properties of fluids and heat effects.

LO4: To access the PVT behavior of the fluids

contents: properties of pure substances, changes in thermodynamic properties and their relationship, Ideal gases and PVT ~~relationship~~ behavior of pure substance, calculation on PVT relationship.

Method of assessment: Internal assessment, sessional quiz
hrs - 10, marks - 10

LO5: To understand the concept of heat effects.

content: definition of heat of mixing, heat of solution, sensible heat, latent heat, heat of formation, heat of combustion, heat of reaction, heat capacity, adiabatic flame temperature. calculation of heat of reaction at different temperature, heat of formation at different temperature, heat of combustion at different temperature, heat at temperature dependency, adiabatic flame temperature.

Method of assessment: End Sem Theory External
hrs - 10 marks - 10

CO 3: To understand second law of thermodynamics.

LO 6: To ^{learn} learn the application of second law of thermodynamics

content: Definition of second law of thermodynamics and its application, statement of second law of thermodynamics, Kelvin Planck's and Clausius Theorems. Heat engine and heat pump. Calculations on heat engine and heat pump. Carnot cycle, corollaries of Carnot principle

Method of assessment: End Sem Theory External
hrs - 10 marks - 10

LO 7: To understand entropy.

content: Concepts of entropy, relationship between lost work and maximum work (ΔS_{total}), Application to engg. problem relative to equilibrium and minimum and maximum work, Calculation of entropy.

Method of assessment: End Sem Theory External
hrs - 10 marks - 10

CO 4: To understand binary system and phase and chemical equilibrium

LO 8: To ~~get~~ get the knowledge of fugacity and properties of mixture.

content: concepts of partial molar properties

Mathematical model for the chemical potential
 Ideal and non ideal solution, Phase
 properties of mixtures, elementary concepts
 of fugacity and coefficient, elementary
 concept of activity and coefficient, Definition
 of ~~substance~~ multicomponent system.

Method of assessment: mid sem Test Internal
 hrs - 10 marks - 10

Lo 9: To understand phase and chemical equilibrium

content: phase equilibrium, concepts for ~~the~~ equilibrium
 between different phases in ~~gas~~ multi component
 non reacting system. Application to
 system particularly vapor-liquid equilibrium
 and solubility. Chemical equilibrium
 temperature dependency of ~~the~~ equilibrium
 constant, chemical reaction equilibrium
 for ideal gas reaction mixture.
 variation of yield in chemical reaction with
 pressure, temperature and composition.

Method of assessment: End sem Theory Internal
 hrs - 10 marks - 05

Co 5: To understand the concept of refrigeration

Lo 10: To know basic of refrigeration

content: Definition of refrigeration, refrigeration
 cycle, types of refrigeration cycles

O C B C

Engg. Thermodynamics

classmate

Date _____

Page _____

5

5th Sem

carnot cycle by TS diagram, Air
refrigeration cycle, vapour compression cycle.

Method of assessment: End sem theory Internal
hrs - 10 marks - 10

LO 11 LO, 11A → To estimate the load of refrigeration
content: capacity of refrigeration, coefficient
of performance, circulation rate,
liquefaction process, Joule-Thomson
liquefaction process. calculation on
power requirement.

Method of assessment: mid sem test Internal
hrs - 10 marks - 10

—————X—————