CH304 CHEMICAL ENGINEERING THERMODYNAMICS – I
Credits: 4 (L = 4, P = 0)
(Pre-requisite: None)

Course Details:

Introduction:
Scope of thermodynamics, Fundamental quantities, Secondary quantities, Work, Energy & Heat.

First law & other basic concepts:
Internal Energy & first law of thermodynamics, state & state functions. Flow & non-flow processes Equilibrium & phase rule. Enthalpy Heat capacity and specific heats.

Heat effects:
Heat capacity of gases as a function of temperature, Heat capacities of solids & liquids. Heat effect of phase change. Standard heats of reaction, standard heats of combustion & formation. Effect of temperature of heats of reaction. Heat effects of industrial reactions.

Second law of thermodynamics:
Second law, Heat engine, the thermodynamic temperature scale, Ideal gas temp. Scale, Second law limitation and real processes. Entropy changes and irreversibility. The third law of thermodynamics.

Thermodynamics properties of fluids:
Relationship among thermodynamic properties, Single phase & two-phase systems, Thermodynamics Diagram & tables. Generalized correlation of properties.

Thermodynamics properties of homogeneous mixtures:
Property relationship for system of variable compositions. Partial molar properties. Fugacity & Fugacity coefficient fugacities of ideal solutions. Property changes on mixing activity and activity coefficients. Excess properties. Treatment for gas mixtures.

Reference Books:

Introduction to Chemical Engineering Thermodynamics:
Mc Graw Hill Publication
Smith & Vanness

Chemical Engineering Thermodynamics:
John wiley & Sons
Sandler

Principles of Chemical Equilibrium:
Cambridge University Press (1977)
K.G Denbigh