

UG

Course Code: CH205

Credit: 4

Version: 1

Prerequisite Course: Nil

Department: **Chemical Engineering**

Course Name: **Chemical Engineering Thermodynamics-I**

L-T-P: **3-1-0**

Approved on:

Introduction: Definitions and Concepts: System, Surroundings, Property, Energy, Work, Thermodynamic equilibrium, stability of equilibrium states.

Zeroth Law of Thermodynamics, Perfect gas scale.

First Law of Thermodynamics: First law of Thermodynamics and Its Applications, First law analysis of processes, Control mass and control volume analysis, Steady state and Transient state flow processes

Volumetric Properties of Pure Fluids: PVT behavior of pure substances, virial equation and its applications, cubic equations of state, generalized correlations for gases and liquids.

Heat Effects: Sensible heat effects, heat effects accompanying phase changes of pure substances, standard heats of reaction, formation and combustion, effect of temperature on the standard heat of reaction.

Second law of Thermodynamics: Limitation of First Law, Kelvin-Planck and Clausius Statements, Reversible and Irreversible Processes, Carnot cycle, Entropy, Second Law analysis of a control volume.

Books

1. Smith, J. M., Van Ness, H. C. and Abbott, M. M., "*Introduction to Chemical Engineering Thermodynamics*", 6th Ed., McGraw-Hill, 2001.
2. Rao, Y. V. C., "*An Introduction to Thermodynamics*," John Wiley, 1993.
3. Kyle, B.G., "*Chemical and Process Thermodynamics*", 3rd ed., PHI New Delhi