

SEMESTER – III

UG

Course Code: CH201

Credit: 4

Version: 1

Prerequisite Course: Nil

Department: **Chemical Engineering**

Course Name: **Chemical Process Calculations**

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

Approved on:

Introduction to Chemical Engineering Calculations: Units and dimensions, the mole unit, conventions in methods of analysis and measurement, basis, temperature, pressure, the chemical equation and stoichiometry.

Gases, Vapours, Liquids and Solids: Ideal gas law calculations, real gas relationships, vapour pressure and liquids, saturation, partial saturation and humidity, introduction to vapour-liquid equilibria for multi-component systems, material balances involving condensation and vaporization.

Material Balances: Material balance of physical processes with and without chemical reaction, including recycle, purge and bypass.

Energy Balances: Concept and Units, calculation of enthalpy changes, general balance with and without reactions, heats of solution and mixing.

Unsteady-state material and energy balances.

Solids, liquids and gaseous fuels, some industrial examples of the above, simple estimation of physical properties (transport, thermodynamic) of fluids and mixtures.

Books

Himmelblau, D. M., “*Basic Principles and Calculations in Chemical Engineering*,” 6th ed., Prentice-Hall of India.

Bhatt and Vora, “*Stoichiometry*,” 3rd ed., Tata McGraw-Hill, New Delhi.

Hougen, Watson and Ragatz, “*Chemical Process Principles*,” Vol. 1, Asia Publishing House, New Delhi.

Saha, S. N., “*Fundamentals of Chemical Engineering*,” Dhanpat Rai Publishing Co., New Delhi, 2000.