Course Code	CP201
Course Title	Chemical Engineering Fundamentals
No. of Credits	3
Pre-requisites	None
Compulsory/Optional	Compulsory

Aim(s): To introduce the learner with chemical engineering fundamentals and to develop skills in solving mass and energy balance problems this will be needed for the analysis of chemical engineering problems.

Intended Learning Outcomes:

On successful completion of the course, the students should be able to

ILO 1: Explain unit operations of Chemical Engineering

ILO 2: Develop a systematic approach to solve mass and energy balance problems

ILO 3: Illustrate technical information using engineering notations, symbols and tools

ILO 4: Derive and apply chemical thermodynamics concepts to solve simple engineering problems

Topics	**Time Allocation/Hours**			
	L	**T**	**P**	**A**
• **Concepts of unit operations** Introduction to unit operations, Flow-chart representation of industrial processes	02			
• **Mathematical modelling of steady-state and transient-state processes** Mass and energy balances, mathematical models over chemical engineering processes such as drying, humidification, distillation, evaporation, cooling towers and chemical reactors	15	02		02
• **Chemical thermodynamics** Revision of basic thermodynamic relationships, Gibbs and Helmoltz free energy, Spontaneous reactions, Chemical equilibria	07	01		
• **Prediction of physical properties of substances and mixtures** Density, Viscosity, Thermal Conductivity, Specific heat capacity, Latent heats, Enthalpy, Critical properties	07	01		02
• **Flow-sheeting** Flow sheeting of industrial processes using computer software			12	
• **Chemical Laboratory** Mass & energy balances for pilot-plant units			04	
Total equivalent hours	**31**	**04**	**08**	**02**

Recommended Texts:

- Sinnott, R.K., Coulson and Richardson's Chemical Engineering, (4 Ed), Elsevier-Butterworth-Heinemann, 2002.
- Narayanan, C. M., Bhattacharya, B. C, Unit Operations and Unit Processes, (1-2 Vol), CBS Publishers & Distributors, 2006.
- Shallcross, D., Chemical Engineering Explained: Basic Concepts for Novices, (1 Ed) Royal Society of Chemistry, 2017.

Assessment	**Percentage Mark**	
In-course		50
Tutorials/Assignments/Quizzes/Laboratory work	25	
Mid Semester Examination	25	

End-semester		50