COURSE CODE	COURSE NAME	L-T-P-Credits	Year of Introduction
CH334	**PROGRAMMING AND PROCESS SIMULATION LAB**	**0-0-3-1**	**2016**

Prerequisite: CH307 Computer programming in C++

Course Objectives

- To develop the skill to model and simulate various unit operations and processes using commercial simulators
- To impart the ability to develop software programmes for simulating Chemical Engineering problems

SYLLABUS

(Minimum of 5 exercises from each part is compulsory)

Part A

1. Introduction to process simulation
2. Equations of state: solution of problems using MS Excel/ MATLAB (Scilab)/ Aspen Plus
3. Phase equilibrium: solution of problems using MS Excel / MATLAB (Scilab)/ Aspen Plus
4. Chemical Reaction equilibrium: solution of problems using MS Excel / MATLAB (Scilab)/ Aspen Plus
5. Mass Balances with Recycle Streams: solution of problems using MS Excel / MATLAB(Scilab)/ Aspen Plus
6. Simulation of Mass Transfer Equipments: solution of problems using MS Excel / MATLAB(Scilab)/ Aspen Plus
7. Chemical Reactors: solution of problems using MS Excel / MATLAB(Scilab)/ Aspen Plus
8. Transport Processes in One Dimension: solution of problems using MS Excel / MATLAB(Scilab)/ Aspen Plus
9. Process simulation of typical chemical plants using Aspen Plus/ HYSYS

Part B

Develop C++ programmes to implement the following numerical methods

Solution of
1. Nonlinear and transcendental equations
2. Linear Algebraic Equations, Set of equations
3. Methods for interpolation and extrapolation
4. Numerical Differentiation and Integration
5. Solution of Ordinary Linear Differential Equations
6. BVP Ordinary and Partial Differential Equations
7. Fitting Models to data

References:

1. Bruce.A.Finlayson, Introduction to Chemical Engineering Computing, Wiley Interscience.

2. Aspen Plus: Building and running a process model: Manual from Aspen Tech, US.

3. Mohd. Kamaruddin Abd Hamid, HYSYS: An introduction to Chemical Engineering Simulation, http://eprints.utm.my/3030/2