Type	Course Code	Name of Course	L	T	P	Credit
DP	NCHC505	Advanced Process Simulation Lab	0	0	3	1.5

Course Objective
This laboratory course aims to acquaint the postgraduate students with advanced process simulation tools and techniques that would make them ready to tackle industrially-relevant process engineering problems.
Learning Outcomes
The students will • learn about the importance of process simulation for a chemical engineer • be introduced to ASPEN Plus and ASPEN HYSYS, and learn them in detail. • get hands-on experience on the aforementioned process simulators for solving a wide range of process engineering problems spanning across refinery, petrochemical, pharmaceutical, food processing industries, to name a few.

Unit No.	Description of Topics	Learning Outcomes
1.	**Introduction to process engineering design and simulation**: Introduction to computer-aided process design and simulation, starting a simulation with ASPEN Plus and ASPEN HYSYS, General procedure for process simulation [component selection, properties and phase equilibrium models, property analysis]	Students will get introduced to the importance of design and simulation in process industries, and start their simulation using ASPEN.
2.	**Simulation of single unit operations:** heat exchangers, separation equipment, reactors	Students will learn to simulate the various building blocks of a process plant.
3.	**Plant design and simulation – component approach:** introduction to flowsheeting, simple concept design of a new process, process simulation in an existing plant, material integration, energy integration, economic evaluation	Students will learn how to retrofit with the help of process simulation, integrate the utilities and conduct economic feasibility analysis
4.	**Industrial-scale plant design and simulation:** Simulation of crude oil distillation unit, FCC unit	Already equipped with single unit operations and component-wise integration, students will now learn to perform process simulation of various industrial-scale plants
	Total Contact hours: 42	