

Subject Code: 09CH0404

Subject Name: Chemical Process Software

Semester: 4th

Objective: To study the simulation techniques of chemical processes and to gain skills in using process simulators.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to:

- 1) Draw the process flow chart in software
- 2) Simulate the various operations of chemical engineering
- 3) Control the process parameter and optimize an output of process

Pre-requisite of course: Basic knowledge of computers, Microsoft office, Chemical engineering operations likes distillation, absorption, extraction, absorption, filtration, etc.

Teaching and Examination Scheme:

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Practical Exam (V)	Term work (TW)	
0	0	4	4	0	30	20	25	25	100

Contents :

Unit	Topics
1	Introduction : Introduction to process modelling and simulation, tools of simulation, approaches of simulation, planning of calculation in a plant simulation.
2	Simulation Software: Introduction of various simulation software, Applications, Features.
3	Optimization of Processes: Definition of optimization, Introduction of various optimization process, criteria, Different techniques for optimization of various process parameters

4	Modeling: Introduction of various models, selection criteria of models, Software available for different models
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Reference Books:

1. Luyben W.L., Process Modeling, Simulation, and Control for Chemical Engineering, McGraw-Hill (1998).
2. Babu, B.V., Process Plant Simulation, Oxford University Press (2004).
3. Denn, M. M., Process Modeling, Longman Sc& Tech. (1987).
4. Himmelblau, D.M and Bischoff, K.B., Process Analysis and Simulation: Deterministic Systems, John Wiley (1968).
5. Holland, C. D., Fundamentals and Modeling of Separation Processes: Absorption, Distillation, Evaporation and Extraction, Englewood Cliffs, Prentice-Hall (1974).

List of Experiments:

1. To study, working and operating practice of filtration operation.
2. To study, working and operating practice of flow sheet unit operation.
3. To study, working and operating practice of stream splitting operation.
4. To study, working and operating practice of stream mixing operation.
5. To study, working and operating practice of absorption operation.
6. To study, working and operating practice of simple distillation operation.
7. To study, working and operating practice of azeotropic distillation operation.
8. To study, working and operating practice of extractive distillation operation.
9. To study, working and operating practice of petroleum distillation operation.
10. To study, working and operating practice of liquid-liquid extraction operation.
11. To study, working and operating practice of simple membrane unit operation.
12. To study, working and operating practice of three phase separation operation.
13. To study, working and operating practice of solid separation operation.

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

