

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CHEMICAL ENGINEERING)
SEMESTER	1
COURSE TITLE	CHEMICAL ENGINEERING EQUIPMENT DESIGN
COURSE CODE	09CH2101
COURSE CREDITS	4

Objective:

- 1 To understand various design of equipment's used in chemical process industries.
- 2 To understand various design of equipment used in chemical process industries.

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

- 1 To Know and understand the various equipments used in the Chemical process Industries.
- 2 To Know and understand the flow diagram and block diagram of the chemical process Industries.
- 3 To know and understand the various accessories and mounting of chemical engineering equipments.

Pre-requisite of course: Basic concepts of Chemistry & Mathematics.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	2	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Various laboratory equipment and devices Basic chemical engineering symbols, Laboratory glass ware, instruments and their practice	3
2	Block Diagram and Flow diagram Basic of block diagram and flow diagram of chemical process industries	3
3	Storage vessels and Pressure vessel Types of storage vessel and pressure vessel in detail, Heads, Covers, and Supports	4
4	Reaction Vessel Types of reaction vessel in detail, glass line reactor jacketed reactor etc, and different parts of reactor vessel	4
5	Pumps and Valves Types of industrial pump and valve, basic technologies like cavitation priming	3

Contents : Unit	Topics	Contact Hours
6	Size reduction equipment Classification of size reduction equipments, Jaw crusher, Roll Crusher, Ball mill etc.	3
7	Heat Exchanger equipment Shell & Tube heat exchanger, Plate & Frame Heat exchangers, Evaporators	4
8	Distillation Simple distillation unit, criteria for selecting distillation operation, Atmospheric and vacuum distillation unit	4
Total Hours		28

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Various laboratory equipment and devices Various laboratory equipment and devices	2
2	Block Diagram and Flow diagram BFD, PFD & PID	4
3	Storage vessels and Pressure vessel Types of storage vessels	2
4	Reaction Vessel Types of reaction vessels	2
5	Pumps and Valves Types of pumps & valves	4
6	Size reduction equipment Various size reduction equipments	6
7	Heat Exchanger equipment Different types of heat exchangers	4
8	Distillation Distillation column	4
Total Hours		28

Textbook :

- 1 Hand book of chemical engineering, Don W. Green, Robert H. Perry, McGraw-Hill , 2008

References:

- 1 "Process equipment design", by M. V. Joshi.
- 2 "Outline chemical Technology" by Gopal Rao
- 3 "Chemical Engineering plant", by Vilbrandt & Dryden.

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
40.00	40.00	10.00	10.00	0.00	0.00

Instructional Method:

- 1 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.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

- 1 https://onlinecourses.nptel.ac.in/noc21_ch18/preview