Birla Institute of Technology & Science, Pilani
Hyderabad Campus

First Semester 2022-2023
Course Handout (Part II)

Date: 29-08-2022

In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course No.: **CHE F312**
Course Title: **Chemical Engineering Laboratory - I**
Instructor-in-charge: Dr. Nandini Bhandaru
Instructors: Dr. Pankaj Kumar, Dr. Nandini Bhandaru

1. **Scope**

The objective of this lab course is to expose the students to the application of fundamental concepts learnt in their Core Discipline Courses like Heat Transfer, Fluid Mechanics, Mass Transfer and Selected Chemical Engineering Operations.

2. **Learning Outcomes**

- Handling various equipment's and instruments
- Conducting experiments, troubleshooting, collecting precise data
- Data analysis and interpretation
- Understanding the application of Chemical Engineering concepts in industrial applications

3. **Text Books**

- Unit Operations of Chemical Engineering by McCabe and Smith
- Introduction to Fluid Mechanics by Fox and McDonalds,
- Mass Transfer by Treybal

4. **List of Experiments:**

S.No.	Lab	Experiment Objective
1.	TP	To determine Reynold's number for laminar, transition and turbulent fluid flow.
2.	TP	To experimentally verify Bernoulli's theorem.
3.	TP	To determine the coefficient of discharge for Venturi & Orifice Meter with Air
4.	TP	To determine the coefficient of discharge for Venturi & Orifice meter and calculate the skin friction losses in three pipes with water
5.	TP	Fixed & Fluidized Bed- To Verify Ergun equation and incipient fluidization

6.	TP	To determine the thermal conductivity of a solid by static method.
7.	TP	To determine overall heat transfer co-efficient for a composite wall.
8.	TP	To determine the thermal conductivity of a liquid.
9.	TP	To study of radiation heat transfer by black body & Test plate.
10.	TP	To determine the heat transfer coefficient of air in a natural convection specification and to compare with theoretically calculated value of the same.
11.	TP	To determine the heat transfer of air in a forced convection specification and to compare with theoretically calculated value of the same.
12.	TP	To study the heat transfer phenomena in shell and tube heat exchanger.
13.	TP	To study the heat transfer phenomena in plate type heat exchanger.
14.	TP	To study the mass transfer of fluids in a wetted wall column.
15.	TP	To determine the diffusion coefficient of liquid in gaseous phase
16.	TP	Liquid-liquid extraction-mass transfer studies between extract and raffinate
17.	TP	To study the process of drop-wise and film-wise condensation.
18.	TP	Bubble Cap Distillation Column-Mass transfer studies
19.	TP	Sieve Plate Column-Mass transfer studies

5. Evaluation Scheme

Component	Duration	Weightage (%)	Date and Time	Nature of Component
Regular experiments/Reports & Viva (Pre-MID term)	3 h/slot	30	Continuous evaluation	Open book
Skill test up to mid semester	1h	20	TBA	Closed book
Regular experiments/Reports & Viva (Post-MID term)	3 h/slot	30	Continuous evaluation	Open book
Final Skill Test	1 h	20	TBA	Closed book

6. Make-up policy

Make-up for the regular lab or tests shall be granted only for genuine reasons and with prior information and permission from the IC.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Dr. Nandini Bhandaru
Instructor-in-Charge, CHE F312