



Second Semester 2020-2021
Course Handout (Part II)

Date: 16-01-2021

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. Satyapaul A. Singh

Instructors: Dr. Nandini Bhandaru, Dr. Debirupa Mitra

1. **Scope**

This course serves as an introduction to important experiments which serve to supplement the Compulsory Discipline Courses in Chemical Engineering.

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

3. **Text Books**

- Unit Operations by McCabe and Smith
- Mass Transfer by Treybal

4. **List of Experiments:**

S.No.	Lab	Experiments
1.	SCEO	Reciprocating pump: To determine the pump efficiency at various piston speeds and flow rates.
2.	SCEO	To determine Reynold's number for laminar, transition and turbulent fluid flow.
3.	SCEO	To determine the thermal conductivity of a solid by static method.
4.	SCEO	To experimentally verify Bernoulli's theorem.
5.	SCEO	To determine overall heat transfer co-efficient for a composite wall.

6.	SCEO	To determine the coefficient of discharge for Venturi & Orifice Meter with Air
7.	SCEO	To determine the thermal conductivity of a liquid.
8.	T P	Fixed & Fluidized Bed-Verify Ergun equation and incipient fluidization
9.	T P	To study the mass transfer of fluids in a wetted wall column.
10.	T P	To determine the diffusion coefficient of liquid in gaseous phase
11.	T P	Liquid-liquid extraction-mass transfer studies between extract and raffinate
12.	SCEO	To determine the heat transfer coefficient of air in a natural convection specification and to compare with theoretically calculated value of the same.
13.	T P	To determine the heat transfer of air in a forced convection specification and to compare with theoretically calculated value of the same.
14.	T P	To study the heat transfer phenomena in shell and tube heat exchanger.
15.	T P	To study the heat transfer phenomena in plate type heat exchanger.
16.	T P	To determine the coefficient of discharge for Venturi & Orifice meter and calculate the skin friction losses in three pipes with water
17.	T P	To study the process of drop-wise and film-wise condensation.
18.	T P	Bubble Cap Distillation Column-Mass transfer studies
19.	T P	Sieve Plate Column-Mass transfer studies
20.	SCEO	To study the temperature-mass profiles in a muffle furnace

5. Evaluation Scheme

Component	Duration	Weightage (%)	Remarks
Regular experiments/Reports & Viva (Pre-MID term)	3 h/slot	40	In the respective lab timings
Regular experiments/Reports & Viva (Post-MID term)	3 h/slot	30	In the respective lab timings
Skill Test	1 h	30	

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.

Notices: All notices will be put in CMS

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. Satyapaul A. Singh
Instructor-in-Charge, CHE F312

