



First Semester 2021-2022
Course Handout (Part II)

Date: 20-08-2021

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. Balaji Krishnamurthy

Instructors: Dr. I. Sreedhar, Dr. Karthik Chetan

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 | TBA |

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. Balaji Krishnamurthy
Instructor-in-Charge, CHE F312

