Birla Institute of Technology and Science, Pilani, Hyderabad Campus

Course Handout (Part II)
First Semester 2019-2020

01/08/2019

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: Lakshmi Sirisha P
Instructors: Dr. Ved Prakash Mishra, Vuchuru Kalyan

1. **Scope**

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

2. **Learning Outcomes**

   - Gain practical knowledge of the equipments used in various unit operations.
   - Conducting experiments, trouble shooting.
   - Data analysis and interpretation.
   - Learning and applying the basic Chemical Engineering concepts

3. **Text Books**

   1. McCabe W. L., and Smith J. M., & Harriott P., *Unit Operations of Chemical Engineering*, 7th Edition., McGraw-Hill International Edition, 2006.
   2. Robert E. Treybal, Mass Transfer Operations, 3rd Edition, McGraw Hill.
   3. William Callister JR, *Material science and Engineering: An Introduction*, 7th Edition, John Wiley 2007
   4. Relevant handouts and Experiment manuals with instructions will be provided.

4. **List of Experiments:**

S. No.	Experiments
	Transport Phenomena - I
1	To determine the pump efficiency at various piston speeds and flow rates for a reciprocating pump.
2	To determine Reynold's number for laminar, transition and turbulent fluid flow.
3	To determine the thermal conductivity of a solid by static method.
4	To experimentally verify Bernoulli's theorem.
5	To determine the thermal conductivity of a composite wall.

6	To determine the coefficient of discharge for Venturi & Orifice Meter with Air
7	To determine the thermal conductivity of a liquid.
8	To determine the heat transfer coefficient of air in a natural convection specification and to compare with theoretically calculated value of the same.
9	To study the temperature-mass profiles in a muffle furnace
	Transport Phenomena - II
1	To study the mass transfer of fluids in a Wetted wall column.
2	To determine the Diffusion coefficient of acetone in gaseous phase
3	Liquid-liquid Extraction - Mass transfer studies between extract and raffinate
4	Fixed & Fluidized Bed- Verify Ergun equation and incipient fluidization
5	To determine the Heat transfer of air in a forced convection specification and to compare with theoretically calculated value of the same.
6	To study the Heat transfer phenomena in Shell-and-tube heat exchanger.
7	To study the Heat transfer phenomena in Plate-type heat exchanger.
8	To determine the Coefficient of discharge for Venturi & Orifice meter and calculate the skin friction losses in different pipes.
9	To study the process of Drop-wise and Film-wise condensation.
	Demo Experiments: Rotary pulp digester, Granulator, Distillation, Micro-GC.

5. **Evaluation Scheme**

Component	Duration	Weightage (%)	Remarks
Regular Experiments (18)	3 hrs/slot	20	OB
Skill Test I (TPI/TPII) + Viva	1 .5 hr	20+10	CB
Skill Test II (TPI/TPII) + Viva	1.5 hr	20+10	CB
Quiz	1 hr	20	CB

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.

Instructor-in-Charge CHE F312