BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2017-2018

Course Handout (Part II)

Date: 01/08/2017

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. Pradipta Chattopadhyay
Instructors :Dr. Srinivas Appari, Dr. BhanuVardhan Reddy, Dr. Pradipta Chattopadhyay

1. Course Description

The course comprises of experiments from various subjects: fluid mechanics, heat transfer and mass transfer. The course involves experiments related to the theory of fluid mechanics: flow past immerse solids, major and minor losses, flow characteristics, continuity principle, boundary layer theory, fluid moving machinery; heat transfer: theory of conduction, convection and radiation, heat exchange equipments such as heat exchangers, condensers, evaporators etc.; mass transfer: VLE studies, separation based on volatility, mass transfer equipments such as crystallizer, distillation column, absorber, adsorber, mass transfer with reaction and other relevant concepts.

2. Scope and Objective/Learning Outcome

The main objective of this course is to educate the students with different aspects of chemical engineering experiments. The students will carry out the set of experiments that will expose them to experimental methods and to integrate theoretical knowledge and concept to practical experience. Students will also learn the operation of scientific equipments for performing experiments.

3. Text Book

Lab Manual for Chemical Engineering Laboratory - I.

4. Reference Materials

Lab Manual supplied by Vendors.

5. Course Plan

The students will perform the following twenty experiments with an emphasis on individual planning and execution of the experiments.

S. No.	Experiment	Marks
	CYCLE - I	
1.	a. Flow through Fluidized Bed b. Flow through Packed Bed	10
2 .	Losses due to pipe fittings	10
3.	Losses due to friction in pipes	10
4.	a. Bernoulli's Theorem verification b. Discharge through venturi, orifice and rotameter	10
5.	Flow through helical coil	10
6.	a. Pitot tube experiment (Water) b. Reynolds Apparatus	10
7.	Centrifugal pump characteristics	10
8.	Reciprocating pump characteristics	10
9.	Heat Pipe demonstrator	10
10.	Thermal Conductivity of solids	10
	CYCLE - II	
S. No.	**Experiment**	**Marks**
11.	a. Stefan-Boltzmann Apparatus b. Parallel flow & Counter flow heat exchanger c. Shell & Tube heat exchanger	10
12.	Cross-circulation drying apparatus	10

13.	a.	Vapor in air diffusion	10
	b.	Open pan evaporator	
14.		Differential distillation	10
15.	a.	Batch crystallizer	10
	b.	Plate type Heat Exchanger	
	c.	Finned Tube Heat Exchanger	
16.		Steam distillation setup	10
17.	a.	Two phase flow	10
	b.	Heat Transfer in agitated vessel	
	c.	Fluidized bed heat transfer unit	
18.		Mass transfer with chemical reaction	10
19.		Adsorption in packed bed	10
20.	a.	Humidification in wetted wall column	10
	b.	Drop wise and film wise condensation	
	c.	Unsteady state heat transfer unit	

6. Evaluation Scheme

EC No.	Evaluation Component	Duration	Marks	Date & Time	Nature of Component
1.	Continuous Evaluation (Reports + Viva)	2hrs/lab	120 (Reports-80 + Viva-40)	Regular Laboratory Hours	Open book
2.	Mid semester Examination	To be announced in lab	90 (Experiments-50 + Quiz- 40)	<TEST_1>	Experiment Performance, Closed Book Quiz
3.	End Semester Examination	To be announced in lab	90(Experiments -50 + Quiz- 40)	<TEST_C>	Experiment Performance, Closed Book Quiz

Chamber Consultation Hour : Thursday, 11 am– 12 noon @ 6020-N

Notices : Notices concerning the course will be displayed on the Chemical Engineering Notice Board/Nalanda.

Instructor-in-Charge
CHE F312