



BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017

Course Handout (Part II)

Date: 26/07/2016

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. Arvind Kumar Sharma, Dr. Ajay Kumar Pani

1. Course Description

The course comprises of experiments from fluid mechanics, heat transfer and mass transfer. The course involves experiments related to the theory of fluid mechanics: flow past immersed 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

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, concepts to practical experience. Students will also learn the operation of different scientific equipments for performing experiments.

3. Text Book

Lab Manual for Chemical Engineering Laboratory - I

4. Reference Materials

Lab Manual supplied by equipment vendors.





5. Course Plan

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

CYCLE - I		
S. No.	Experiment	Marks
1.	a. Flow through Fluidized Bed b. Flow through Packed Bed	9
2.	a. Losses due to pipe fittings b. Losses due to friction in pipes c. Drag Coefficient determination	9
3.	a. Bernoulli's Theorem verification b. Discharge through venturi, orifice and rotameter c. Flow through helical coil	9
4.	a. Pitot tube experiment (air & water) b. Reynold's Apparatus	9
5.	Centrifugal pump characteristics	9
6.	a. Heat Pipe demonstrator b. Thermal Conductivity of composite wall	9
7.	a. Drop wise and film wise condensation b. Unsteady state heat transfer unit	9
8.	a. Heat Transfer in agitated vessel b. Open pan evaporator	9
9.	a. Parallel flow & Counter flow Double pipe heat exchanger b. Shell and Tube heat exchanger	9
10.	a. Plate type Heat Exchanger b. Finned tube heat exchanger	9
CYCLE - II		
S. No.	Experiment	Marks
11.	Double effect evaporator	9





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12.	a. Packed bed heat transfer unit b. Stefan-Boltzmann Apparatus	9
13.	Vapor in air diffusion	9
14.	Sieve plate distillation column	9
15.	Batch crystallizer	9
16.	Simple batch distillation setup	9
17.	Vapor liquid equilibrium setup	9
18.	Mass transfer with chemical reaction	9
19.	Adsorption in packed bed	9
20.	Humidification in wetted wall column	9

Breakup: 5 marks for report submission, 4 marks for pre-viva (each experiment)

6. Evaluation Scheme

EC No.	Evaluation Component	Duration	Weightage % (Marks)	Date & Time	Nature of Component
1.	Continuous Evaluation	2 hrs/lab	60 (180)	Regular Laboratory Hours	Open book
2.	Mid semester Examination	To be announced in lab session	20 (60)	Laboratory Hours	Experiment Performance, Viva and Closed Book Quiz
3.	End semester Examination	To be announced in lab session	20 (60)	Laboratory Hours	Experiment Performance, Viva and Closed Book Quiz

Chamber Consultation Hour Notices

: Saturday, 11 A.M - 12 noon @ 6020-N

: All notices concerning the course will be displayed in the Chemical Engineering Notice Board.

Instructor-in-Charge
CHE F312



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