



SECOND SEMESTER 2021-22
Course Handout Part II

Date: 15-01-2022

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 F341
Course Title : CHEMICAL ENGINEERING LAB-II
Instructor-in-Charge : Dr. Iyman Abrar
Instructors : Dr. Pankaj Kumar & PhD students

Scope and Objective of the Course:

The objective of this lab course is to expose the students to the application of fundamental concepts learnt in their Core Discipline Courses like Selected Chemical Engineering Operations, Process Dynamics Control, and Reaction Engineering.

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

Textbooks:

- o Unit Operations by Mc Cabe and Smith
- o Mass Transfer by Treybal
- o Process control by Seborg
- o Chemical Reaction Engineering by Fogler

Course Plan:

Exp. No	Lab Name	Experiment Name & Objective
Expt-1	SCEO lab	<u>Emissivity</u> : To study of radiation heat transfer by black body & Test plate.
Expt-2	SCEO lab	<u>Pool Boiling & Critical Heat Flux</u> : To study the pool boiling heat transfer phenomena & critical heat flux.
Expt-3	SCEO Lab	<u>Centrifugal Pump</u> : To study of centrifugal pump in series & parallel mode & to find pump characteristics.
Expt-4	SCEO Lab	<u>Water Cooling Tower</u> : To study mass transfer operation in water cooling tower for different flow and thermodynamic conditions.
Expt-5	SCEO Lab	<u>Natural Draft Tray Dryer</u> : To study the drying characteristics of a solid material under natural draft condition.



Expt-6	SCEO Lab	<u>Adsorption In Packed Bed</u> : To study of adsorption in a packed bed for a solid liquid system.
Expt-7	SCEO Lab	<u>Fluidized Bed Dryer</u> : To study the operation of fluidized bed dryer.
Expt-8	SCEO Lab	<u>Sedimentation Studies</u> : To study of batch sedimentation process.
Expt-9	PC Lab	<u>Pressure Control Trainer</u> : To study the control system in Pressure Control Trainer.
Expt-10	PC Lab	<u>pH Control Trainer</u> : To study the control system in pH Control Trainer.
Expt-11	PC Lab	<u>Level Control Trainer</u> : To study the control system in Level Control Trainer
Expt-12	PC Lab	<u>Temperature Control Trainer</u> : To study the control system in Temperature Control Trainer.
Expt-13	CRE lab	<u>Batch Reactor</u> : To study the order and rate constant for the reaction between sodium hydroxide and ethyl acetate in a batch reactor.
Expt-14	CRE lab	<u>Continuous Stirred Tank Reactor</u> : To study the order and rate constant for the reaction between sodium hydroxide and ethyl acetate in a CSTR.
Expt-15	CRE lab	<u>Plug Flow Reactor</u> : To study the order and rate constant for the reaction between sodium hydroxide and ethyl acetate in a PFR.
Expt-16	CRE lab	<u>Cascaded CSTR (CSTR In Series)</u> : To compare the conversion of reactants between a single CSTR and CSTRs in series.
Expt-17	CRE lab	<u>CSTR & PFR in Series</u> : To compare the conversion of reactants between PFR and CSTR & PFR in series.
Expt-18	CRE Lab	<u>Spectrophotometer</u> : To find unknown concentration of a color solution using spectrophotometric method.

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Lab. experiments & report up to mid semester	3 hr	25	Continuous evaluation	Open book
Skill test up to mid semester	15 min	30	Continuous evaluation	Closed book
Lab. experiments & report after mid semester	3 hr	20	Continuous evaluation	Open book
Skill Test after mid semester	15 min	25	Continuous evaluation	Closed book

Chamber Consultation Hour: To be announced in the class.

Notices: All notices concerning this course will be displayed on the Notice Board of Chemical Engineering or CMS

Make-up Policy: Make-up for the test may be granted only with prior permission and valid justification from the Instructor-in-charge.

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
Dr. Iyman Abrar

