CHEMICAL REACTION ENGINEERING LAB

Course	Code:	13CH1133	L	Т	Р	С
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Course Outcomes:

On successful completion of the course, the student should be able to

- **CO 1** Operate lab equipments like CSTR, Batch, PFR reactors.
- **CO 2** Analyze the concentration versus time data and determine the specific rate constant and the order of the reaction.
- **CO 3** Compare theoretical and experimental conversions in a CSTR and PFR.
- CO 4 Estimate RTD and model parameters in a CSTR and PFR
- CO 5 Estimate RTD and model parameters in packed bed and CSTRin-series.

*Student should also submit a detailed report for all the above laboratory practicals.

LIST OF EXPERIMENTS:

- 1. Determination of the order of a reaction using a batch reactor and analyzing the data by
 - (a) Differential method (b) integral method. Major equipment - Batch reactor
- 2. Determination of the order of a reaction and rate constant using a packed bed reactor and analyzing the data by

3. Determination of the activation energy of a reaction using a batch reactor

Major equipment - Batch reactor

⁽a) differential method(b) integral method.Major equipment – Packed bed reactor

- To determine the effect of residence time on conversion and to determine the rate constant using a CSTR. Major equipment – CSTR apparatus
- To determine the specific reaction rate constant of a reaction of a known order using a batch reactor. Major equipment - Batch reactor
- To determine the order of the reaction and the rate constant using a tubular reactor. Major equipment – PFR apparatus
- CSTRs in series- comparison of experimental and theoretical values for space times and volumes of reactors. Major equipment - CSTRs in series setup
- Mass transfer with chemical reaction (solid-liquid system) determination of mass transfer coefficient. Major equipment – beaker, stirrer
- Axial mixing in a packed bed. Determination of RTD and dispersion number for a packed-bed using a tracer Major equipment - Packed bed set up
- Determination of RTD and dispersion number in a tubular reactor using a tracer. Major equipment - PFR set up
- 11. Determination of mass transfer coefficient using Sodium sulphite method.

