
Chemical engineering labs description

1. PROCESS FLUID MECHANICS LABORATORY

The process fluid Mechanics laboratory in the chemical engineering department is engaged to enhance understanding of the basics of fluid engineering principles. The experiments are designed to apply various measurement of fluid properties and flow characteristics. The lab is equipped with different units related to fluid mechanics such as flow measurement unit, fluid friction in pipes and fittings test unit, viscometers, pumps and others.

Equipment:

1. Hydrostatics and Properties of Fluids
2. Flow Measurement unit
3. Losses in Piping Systems
4. Series and Parallel Pump Test Set
5. fixed and fluidized bed



2. SEPARATION PROCESS I LABORATORY

The separation processes 1 Laboratory is equipped for the study of the various mechanical operations associated with solids particles. Experiments mainly deal with size reduction, size separation, clarification, solid fluid separation etc. All basic experiments for fluid particle mechanics like Jaw Crusher, Plate and Frame Filter press, Froth Flotation, Batch Sedimentation, and Sieve Shaker are available in this laboratory.

Equipment:

1. Plate and frame Filter Press
2. Jaw Crusher
3. Sieve shaker
4. Sedimentation unit
5. Aeration tank
6. floatation unit



3. HEAT TRANSFER LABORATORY

Heat Transfer Laboratory helps the students to understand the basic concepts of heat transfer: Conduction, Convection and Radiation, which are the three basic modes for heat transfer to take place. To enhance the practical knowledge of industrial equipment, students perform experiments on some common heat transfer equipment such as linear heat conduction, free and forced convection, Double Pipe Heat Exchanger, Shell & Tube Heat Exchanger and Single Effect Evaporator.

Equipment:

1. Linear/Radial heat conduction unit.
2. Free and forced convection unit.
3. Radiation heat transfer unit.
4. Boiling heat transfer unit.
5. Shell and tube heat exchanger.
6. Parallel tube heat exchanger.
7. Thermal conductivity measurement unit.



4. THERMODYNAMICS LABORATORY

The purpose of Thermodynamics Laboratory is to help the undergraduate students to understand the basic thermodynamic principles by practical applications. The lab includes Bomb calorimeter, Sterling cycle, Work to heat apparatus Temperature and pressure measurement apparatus.

Equipment:

- 1- Mechanical Equivalent of heat.
- 2- Bomb Calorimeter.
- 3- Sterling Engine.
- 4-Temperature measurement kit.
- 5- Pressure measurement kit.



5. REACTION ENGINEERING LABORATORY

Reaction engineering laboratory provides undergraduate students with hands-on acquaintance on chemical reactor operations involved in industrial operations. The reaction laboratory inculcates students' skills to correlate theoretical concepts and practical reactor operations.

The experiments performed by the students in the laboratory are related to chemical kinetics, operation of reactors such as batch reactor, Continuous Stirred Tank Reactor (CSTR), tubular reactor. Experiments related to chemical reactor dynamics are also conducted. Reactors are either operated in manual mode or automatic mode and the data collected is processed and analyzed using soft skills.

Equipment:

1. Batch reactors.
2. Tubular reactor
3. Continuous Stirred Tank Reactor



6. UNIT OPERATIONS LABORATORY

Unit operations lab is part of Chemical Engineering Lab III – ChE406; it is designed to introduce students to larger scale industrial processes commonly encountered by chemical engineers in industry. In each experiment, students work in teams to collect experimental data followed by thorough analysis using the theoretical principles they learned in previous courses.

The laboratory is equipped with top quality learning equipment that cover a wide range of industrial processes ranging from traditional separation processes such as distillation, evaporation, extraction, drying, adsorption and gas absorption, to nontraditional separation processes such as ion exchange and reverse osmosis.

The objective of this laboratory is to introduce the basic principles and methods of experimental engineering to the students. The primary emphasis of the laboratory is on fundamental understanding the underlying principles of the topics that were discussed in the theoretical courses using various experimental techniques, instruments and apparatus designed specifically for the subjects concerned. Additionally, students will learn to conduct a laboratory experiments safely and will have the opportunity to improve their written communication skills through preparation of laboratory reports.

Equipment:

1. Distillation column
2. Packed Tower Gas Absorption
3. Single effect evaporator
4. Liquid-liquid Extraction column
5. Tray drier
6. Ion exchange unit
7. Reverse osmosis
8. Cooling tower
9. Adsorption unit



7. PROCESS CONTROL LABORATORY

Process control lab is part of Chemical Engineering Lab III – ChE406; it is designed to introduce students to larger scale industrial processes commonly encountered by chemical engineers in industry. In each experiment, students work in teams to collect experimental data followed by thorough analysis using the theoretical principles they learned in previous courses.

The laboratory is equipped with top quality learning equipment that cover a wide range of industrial processes control such as pressure control, temperature control, flow control and level control. In addition, students perform simulation experiments that mimic real industrial processes using specialized software.

The objective of this laboratory is to introduce the basic principles and methods of experimental engineering to the students. The primary emphasis of the laboratory is on fundamental understanding the underlying principles of the topics that were discussed in the theoretical courses using various experimental techniques, instruments and apparatus designed specifically for the subjects concerned. Additionally, students will learn to conduct a laboratory experiments safely and will have the opportunity to improve their written communication skills through preparation of laboratory reports.



Equipment:

1. Level Workstation
2. Flow temperature workstation
3. Pressure Workstation
4. Distillation column controllers