LHP 701
CHEMICAL ENGINEERING LABORATORY

The LHP-701 laboratory comprises of three sections:
1. **CTS 3020**: An experimental set of equipment that comes as complementary to the Chemistry I and includes additional equipment for more experiments in Inorganic an Organic chemistry.
2. **CE 3030**: A Chemical engineering laboratory set that intends to enrich the equipment base of technical institutes and universities for implementing Chemical engineering processes.
3. **CE 3040**: Chemical process plants that cover topics as Extraction in various forms (liquid-liquid, solid-liquid,…), Distillation of different mixtures including Plant supervision and control.

The laboratory sets and Pilot plans are listed on the right of this page.

The laboratory intends to enrich the equipment of technical institutes and universities for implementing an up-to-date and complete testing program. All the products have been designed and manufactured according to some principles:

- As accurate as possible reproduction of the industrial design on a reduced scale;
- Use of industrial instruments (sensors, transducers, actuators);
- Best quality of materials and industrial standards with great use of stainless steel and of borosilicate glass;
- Application of the most advanced technologies of plant supervision and control.

The laboratorys' add on equipment is accompanied by the appropriate software to run interactively with PC workstations, wherever this is applicable. The student is able to change the data and the parameters of the system. The programs present schematically the results of the adjustments performed by the student.

The plants are accompanied by technical manuals for theory and exercises. Each one of the lab equipment is described hereinafter.

CTS 3020 Chemistry II
CS 3021 Advanced Chemistry lab set
CS 3022 Heating plate
CS 3023 Precision laboratory balance
CE 3030 Chemistry II – Chemical process
CS 3031 Chemical Reactor apparatus
CE 3032 Rotary evaporator
CE 3033 Chemical Extraction LL and SL
CE 3040 Chemical process Plants
CE 3041 Multifunctional Distillation plant
CE 3042 Liquid to Liquid Extraction Pilot Plant (*manual & automated version*)
CE 3043 Multifunctional Extraction and Distillation Pilot Plant
CE 3044 Multifunctional Extraction Pilot Plant
CE 3045 Continuous Distillation Pilot Plant

CTS 3020 - CHEMISTRY II

CS 3021
Advanced Chemistry lab set

This experimental set of equipment comes as complementary to the Chemistry I – CS1 & CS2 students set and includes additional equipment for students to perform more experiments in Inorganic an Organic chemistry, beyond and above the experiments of Chemistry I. Cross using equipment in several kits offers a best cost-performance solution to the client.

CS 3022
Heating plate – flask 500ml with Magnetic Stirrer

Stirring Capacity: 500ml;
Heating Power: 250W;
Max Temperature: 380℃;
Stirring Speed: 0~1400 rpm.

CS 3023
Precision laboratory balance - Digital

100/200 x0.001g 1mg Laboratory Analytical Balance Digital - High Precision Electronic Scale.

CE 3030 - CHEMISTRY II: CHEMICAL PROCESS

The CE3030 series of Chemical engineering laboratory sets intends to enrich the equipment base of technical institutes and universities for implementing **Chemical engineering processes**. All the products have been designed and manufactured according to the highest standards, materials, modern technology and all safety considerations for the students.

CS 3031
Chemical Reactor apparatus

- A dual jacket Chemical Reactor equipped with the flush bottom valve of the special type to ensure leak – free sealing over entire temperature range.
- Designed to keep L/D ratio within 1.5 (max) for performance and easy scale up. Uses Borosilicate glassware.
- Ideal for bench top fume hoods.
- It has a Stirrer with suitable seal (Mechanical, Stuffing, Box, Magnetic Seal, High Vacuum Stuffing Box).
- It provides Skid mounted and quick release coupling for ease of installation and dismasting.
- The Overhead stirrer motor has built-in speed controller and speed display.

It provides Interchangeable Stirrer (Anchor / Propeller / Turbine).

CE 3030 - CHEMISTRY II: CHEMICAL PROCESS

CE 3032
Rotary evaporator

The Rotary evaporator is an evaporating apparatus suitable for reflux operation, rapid evaporation of solvent, concentration of trace components and reaction processes requiring stirring.
It is mainly used for concentration, crystallization, drying, separation and solvent recovery in pharmaceutical, chemical and biological pharmaceutical industries.

CE 3033
Chemical Extraction LL and SL

A **Soxhlet Extraction Apparatus** which includes: a 0.5L Reactor, 2L Extractor, appropriate condenser, a 0.5L Heating Mantle & Metal stand for support.

CE 3040 - CHEMICAL PROCESS PLANTS

CE 3041
Multifunctional Distillation plant

This is a versatile unit and can be used as Reaction Distillation Unit, Fractional Distillation Unit or a combination of both. All features of Reaction Distillation Unit and Fractional Distillation Unit are incorporated in the same frame unit to provide a versatile solution in a chemical engineering laboratory.

CE 3042
Liquid to Liquid Extraction Pilot Plant

LL/ LL1 Pilot plan - manual version
LL/ LL1a Pilot plan - automated version

The Liquid to Liquid Extraction Pilot Plant unit includes two separate tanks for the solvent and for the phase having to be refined, that are sent to the extraction column by two metering pumps. The column is provided with top and bottom phase separators and with two other tanks for collecting the refined and extracted products. It can be provided for manual operation or automated via PID control.

CE 3040 - CHEMICAL PROCESS PLANTS

CE 3043
Multifunctional Extraction and Distillation Pilot Plant

The Multifunctional Extraction and Distillation Pilot Plant consists of a liquid-liquid extraction column of glass with rotating discs installed aside a distillation column. This last column can be used to recover the solvent used for the extraction, or separately for the study of distillation process. It can be provided for manual operation or automated via PID control.
The automated version is equipped with 2 PID controllers enabling to control the level in the extraction column and the flow rate of the water cooling the condenser of the distillation column.

CE 3044
Multifunctional Extraction Pilot Plant

This Multifunctional Extraction Pilot Plant enables to study three different types of extraction:
- Liquid/liquid extraction
- Solid/liquid extraction with heavy extracting phase
- Solid/liquid extraction with light extracting phase.

These three types of extraction are carried out through 3 interchangeable extraction vessels.

CE 3045
Continuous Distillation Pilot Plant

The Continuous Distillation Pilot Plant is aimed for continuous distillation. The solution has to be distilled, stored in a tank of plastic material, sent to the distillation column by a metering pump after crossing a pre-heating exchanger. The distillation column is completely of glass and it consists of a reboiler, a sieve-tray column and a condenser with reflux head and valve. The bottom product and the distillate are collected into two tanks after being cooled by two heat exchangers.