

APPLIED CHEMICAL ENGINEERING FOR THE REFINING AND PETROCHEMICAL INDUSTRIES*

OBJECTIVES

To provide participants with a good understanding of the refining, petrochemistry chain and of the equipment.

On completion of the course, the participants are able to:

- understand the structure of the refining and petrochemical industries, describe the main characteristics of the different processes (objectives, operating conditions, quality requirements, safety) and give the proper function of each unit within a coherent general production scheme
- understand the fundamentals of chemical engineering, design equipment for separation, heat transfer and exchange as well as build process control schemes for industrial units and establish process flow diagrams and piping and instrumentation diagrams
- master the fundamentals of polymer chemistry, describe the main characterization methods and structure/properties relationships for polymeric materials
- understand the cost structure, know the basic elements for investment decisions and capital budgeting in petrochemicals industries.

COURSE CONTENT

BASICS FOR CHEMICAL ENGINEERING

10.5 days

Thermodynamics applied to liquid-vapor equilibria.
Hydrocarbon physico-chemistry.
Fluid dynamics.
Heat transfer.
Thermodynamics. Kinetics. Catalysis and industrial reactors design.

PETROLEUM PRODUCTS AND REFINING PROCESSES

18 days

Crude oil and petroleum products.
Distillation (theory and dynamic simulation).
Introduction to process simulation software (PROII).
Refining processes, schemes and visit of a refinery.

INDUSTRIAL EQUIPMENTS AND INSTRUMENTS

14 days

Materials and corrosion.
Static equipment.
Rotating machinery.
Heat exchangers, furnaces and boilers.
Instrumentation. Process control.

MONOMERS AND POLYMERS MANUFACTURING

15.5 days

Olefins and aromatics in petrochemistry.
Polymer structure, conformation and characterization.
Introduction to industrial polymer processes.
Logistics and transportation of liquids and powders.
Description of main steps of a polymer project and methodology for organizing a sustainably safe and clean operation of petrochemicals plants (HAZOP studies).
Visits to a polymer research center, steamcracker, polymers units and transformers.

ECONOMICS

2 days

Capital budgeting.
Economics of supply and refining operations.

CASE STUDIES

13 days

Two projects based on conception, design and cost estimation of an industrial distillation column and different heat exchangers.
These studies are carried out by trainees with lecturer guidance.

▲ Who should attend?

Graduate engineers seeking to enhance their knowledge in chemical engineering and essential concepts relating to oil and gas products, refining processes and polymers.

▲ Duration

73 days

▲ Dates & Location

September -
December, 2008

Rueil-Malmaison (Paris)
Martignes (Marseille)
Lillebonne (Normandy)

▲ Tuition Fees

€ 9,950

Transport and living
expenses non included

▲ Course Coordinator

Carole Le Mirronet

Ref. **GCA / ACE**

* This module is a part of a 16 month master's degree program at IFP School.
Two training sessions (5 days + 8 days) are organized between September and December in the ENSPM Formation Industrie - IFP Training centers (outside Rueil-Malmaison).