Training - Petroleum Refining and Petrochemicals

PETREF-EN-P | Face-to-face only | 85 days

This training aims at developing competencies in processes, equipment, operation, safety, and the economical aspects of petroleum refining and petrochemicals

IFP Training Certificate

Graduate Certificate

Level

Knowledge

Public

Engineers entering the refining and petrochemical industries or professionals with limited industry experience wishing to broaden their knowledge

Objectives

Attendees will be able to implement the following skills:

- Understand the basics of refining techniques
- Analyze the performances of the processes concerned, and optimize them
- Select and design the main equipment of processing plants
- Comprehend the technology and operation of equipment
- Understand the main refining processes, their fundamental aspects and operation
- Recognize safety and environmental issues in operation of such units
- Explain economic industry issues

Pedagogical & technical resources

- Case studies and applications related to industrial situations
- Dynamic simulators (CORYS IndissPlus simulators): equipment simulators and generic process units simulators
- Project: design of a distillation column using PROII/PROVISION

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

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Program

PHYSICO-CHEMICAL PROPERTIES OF HYDROCARBONS & PETROLEUM CUTS — 5 days

Organic compounds, crude oil and petroleum products.
Quality control - Standard tests - Blending rules.

APPLIED THERMODYNAMICS — 5 days

Properties of pure substances.
Fluid properties: liquid-vapor equilibria of hydrocarbons mixtures, of non-ideal mixtures, of non-identified components.
K values from modern numerical methods.

DISTILLATION COURSE & PROJECT WITH PROII — 10 days

Classical industrial column design, short cut methods.
Operating parameters, optimization, process control parameters.
Internal equipment.
Practice of PROII/PROVISION, process simulation, simplified design of equipment, economic evaluation and optimization.

HEAT TRANSFER EQUIPMENT — 5 days

Heat transmission.
Heat exchangers: sizing and performances, operation.
Furnaces and boilers: performances, operating conditions, combustion, operation, safety.

FLUID FLOW - ROTATING MACHINERY — 10 days

Characteristics of liquid and gas simple phase flow; gas compression laws, expansion.
Technology and operation of pumps, compressors, steam turbines, gas turbines, electrical motors.

INSTRUMENTATION & PROCESS CONTROL — 5 days

Instrumentation, controllers, valves, control loops implementation.
PID tuning, monovariable control limits, multivariable control.

REFINING PROCESSES - PRINCIPLES & OPERATION — 20 days

Characteristics of feeds and products, principles of the processes used, operating and control parameters of the unit, analytical follow-up, typical incidents, concerning the following refining units:

- Atmospheric and vacuum distillation of crude oil, Catalytic reforming, isomerization, hydrotreatment, sweetening of light cuts and sulfur recovery.
- Conversion of heavy cuts and related units: visbreaking, coking, FCC, RFCC, distillate hydrocracking, residue hydrocracking.
- Base oil refining.

PETROCHEMICAL PROCESSES - PRINCIPLES & OPERATION PRODUCTION OF OLEFINS & AROMATICS — 12 days

Production of olefins and aromatics:

- Sources, outlets and main industrial uses of olefinic and aromatic intermediaries.
- Steam cracking and treatment of the cuts produced.
- Fluid catalytic cracking (FCC) and production of aromatics.
- Economics of petrochemicals.

Production of convenience polymers (PP, PE, PS, PVC, PET):

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- Nature and types of polymers.
- Implementation principles and techniques.

Production of syngas:

- Main processes: steam reforming, partial oxidation (POX).
- Valuation of synthesis gas: combined cycles.

SAFETY - UTILITIES - ENVIRONMENT IN OPERATION — 8 days

Process safety:

- Product and equipment related risks, safety in process operation.
- Hazard analysis in design and operation.

Utilities:

- Steam networks.
- Electricity generation and networks.
- Production and distribution networks for air, fire and cooling water; flare.

Environmental control:

- Air pollution sources, detection and technologies for reduction.
- Sources of aqueous pollution; wastewater treatment, regulation and controls.

PETROLEUM ECONOMICS — 5 days

Evolution of the demand for derived products, international oil markets.
Short-term refinery management.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com

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