TECHNICAL
EDUCATION
ACADEMY

School of Engineering

COURSE PROGRAMME

000094

RPCH010 - Refining Processes & Petroleum Products

This course will present an overview of the modern, integrated petroleum refinery, itsfeedstocks, product slate and the processes employed to convert crude oil andintermediate streams into finished products.



Learn from the Best in the Business!

Course overview

Foundation level

Why take this course

This course will present an overview of the modern, integrated petroleum refinery, itsfeedstocks, product slate and the processes employed to convert crude oil andintermediate streams into finished products. Hydrocarbon chemistry, crude oil propertiesand fuel product quality will be discussed. Each refining process will be presented,covering operating description and conditions, feedstock and catalyst selection, productyields, and the relationship between process parameters, unit performance and productoutput and properties.

This course provides major insights into both primary andsecondary processes likeAtmospheric Distillation, Vacuum Distillation, Cracking, Hydrocracking, Catalytic Reforming,Processes for LOBS, Coking, Visbreaking, in a typical refinery.

Who it is for and how it helps

Professionals in the Oil & Gas industry or related sectors (in the technical, commercial, legal, finance, or HR departments) interested in oil refining.

What you will learn

- Learn about the composition, main characteristics and new trends of petroleum products
- Understand the role of various processing units in a refinery
- Describe the main manufacturing schemes encountered in oil refining
- Assess the economic environment of this industry

Curriculum

Modules 01–04

01 Petroleum products

- Energy and non-energy products and their main uses, CO2 emissions and main regulated pollutants in the end use.
- Principal components of petroleum products; general hydrocarbon classification and main impurities (sulfur, nitrogen, metals and asphaltenes, etc.).
- Quality requirements imposed on petroleum products in view of their utilization: quality specifications measured by standard tests, characteristics related to the product composition, origin and processing routes.
- New trends in market structure and product characteristics to European and worldwide scale, post-combustion depollution systems, biofuels (nature, alternative fuel pathways for transport, strengths and weaknesses).

02 Refining processes

- Crude oil fractionation:
- Origin, overall characteristics and classification of crude oils.
- Yields and properties of straight-run cuts obtained by distillation, potential destinations.
- Industrial units: atmospheric distillation, vacuum distillation, light-ends fractionation.
- Typical process scheme, operating conditions, energy consumption.

03 Catalytic reforming and isomerization:

- Octane improvement of virgin naphthas.
- Basics of processes, types of catalyst, product yields and hydrogen production.
- Industrial units: process flowsheets, operating conditions, equipment, low pressure processes.

04 Hydrorefining processes:

- Main features of impurities removal by catalytic hydrogen treatment.
- Main refining applications.
- Example of ULSD hydrotreatment unit: operating principles, operating conditions.
- Scrubbing treatments: amine washing, sulfur production, treatment of residual gases from Claus units.

Curriculum

Modules 05–08

05 Conversion units:

- Outline of conversion and various cracking processes.
- Characteristics and origin of feeds for cracking.
- Conversion by means of thermal cracking: visbreaker, various cokers.
- Conversion by means of catalytic cracking: FCC and related units, gasoline sweetening and desulfurization, alkylation, production of MTBE, ETBE and propylene, hydrocracker and related units, hydrogen production (SMR, POX).
- Recent developments in hydrotreatment and hydroconversion of heavy residues.
- Hydrogen balance in the refinery, energy consumption per unit, CO2 emissions at the outlet of the refinery.

06 Other processes for production of petroleum products:

- GTL
- synthetic crude oils.

07 Manufacturing flowsheets

- Main routes to major products.
- Up to date refining schemes including the production of petrochemical intermediate products.
- Impacts of the evolution of market demand and the quality of the products on manufacturing patterns.
- Base lube oil manufacturing.

08 Main economic features of refinery operation

- Prices of crude oils and products, operating costs, economic margin of a refinery.
- Examples of flexibility in operation and its economic consequences.

Participation and contacts

Joining the programme

Contact the Academy and quote course code 000094 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
www.tecedu.academy

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