Planning & Economics of Refinery Operations
In collaboration with the Energy Institute, London

3.00 days
Overview

AUDIENCE
Technical, operating and engineering personnel working in the refining industry, trading and commercial specialists, independent consultants, process licensors, catalyst manufacturers and refining subcontractors.

PURPOSE
This course provides a better understanding of the essential elements of refinery operations in order to review the various parameters which affect refinery profitability and to develop a working knowledge of the management tools used in the refining industry.

LEARNING OBJECTIVES
Upon completion of the course, participants will be able to:
- assess the latest trends in product specifications, and refining schemes,
- calculate product value, refinery margins and process unit margins,
- simulate and to optimize refinery operations, crude oil selection and product manufacturing,
- analyze the results of an linear programming model optimization.

PREREQUISITE
Basic notions of Microsoft Excel.

WAYS AND MEANS
Case studies and exercises derived from present refinery situations.
Economic optimization using Excel.
Quiz.

Agenda

TECHNICAL OVERVIEW
Brief technical presentation of the main refining units: distillation, conversion, etc.
Refinery scheme evolution.

0.25 d

REFINERY MARGINS & COSTS
Refinery margins and costs: definitions and evolution worldwide.
Notion of break-even point.
Unit margins and intermediate product valuation.
Case studies: crude oil arbitrage, Fluid Catalytic Cracking (FCC) unit margin.

0.75 d

REFINERY BLENDING SIMULATION
Case study: managing the blending operation of a refinery taking into account the economic and technical (product specifications, capacities, etc.) constraints.

0.50 d

OPTIMIZATION OF REFINING OPERATIONS - LINEAR PROGRAMMING

1.00 d
Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
Case study on Excel: explanation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis.

CRUDE OIL ASSESSMENT & SELECTION
Different methods to assess a crude: netback value, method of the complementary crude.
Case study: crude oil ranking using a LP model.