

# € TRAINING

Production Planning and Scheduling  
Petroleum Refineries





# Production Planning and Scheduling Petroleum Refineries

## Introduction:

This program is specifically designed to identify and resolve issues of production planning and scheduling in petroleum refineries that are most commonly encountered by refinery personnel working in this area. The program is oriented toward the practical aspects of refinery operations as well as the terminology and economics of refining.

## Program Objectives:

At the end of this program, participants will be able to:

- Gain an appreciation of the planning and scheduling tools that will be useful for planning of crude and product deliveries.
- Differentiate and appreciate the similarities and differences between planning and scheduling.
- Understand the principles of scheduling optimization.
- Learn the skills to crude selection and optimization that results in improved profitability.
- Develop the skills necessary to apply blending techniques using excel and linear programming software.

## Targeted Audience:

- Operations personnel including shift supervisors.
- Marketers and refinery planners.
- Blending professionals, Refining Technologists.
- Other engineers who would like a further understanding of the complex refining processes and their impact on refinery planning and scheduling.
- Accountants, marketers, and other professions who would like to understand the complexities and terminology of Production Planning & Scheduling in Petroleum Refineries.

## Program Outlines:

### Unit 1:

#### Application of Planning and Scheduling:

- Overview of planning and scheduling in oil refineries, including refinery configuration, choice of crude, and capacity utilization.

- Refinery Configuration, covering hydro skimming refineries, secondary conversion processes, and integrated refineries.
- Consideration of existing and new refineries, along with the selection of crude and scheduling processes.
- Optimization strategies for cut-points, managing upset situations, and assessing tankage requirements.
- Understanding the severity of process operations and their impact on refinery planning and scheduling.

## Unit 2:

### Improving Product Movements and Releasing Tankages:

- Basic Information Required.
- Crude Assay.
- Intermediate Feed Characteristics.
- Yields and Properties.
- Different Process Units.
- Utilities.

## Unit 3:

### Product Blending Rules:

- Product Specifications.
- New Trends in fuel production.
- Environmental Issues.
- Crude Cost.
- Product Netback.

## Unit 4:

### Formulation of Problem:

- Refinery Flow-sheets, Simplified Material Balance.
- General Formulation, Demand Equations, Product Inventory Control.
- Product Quality Control, Fixed Composition Blend.

- Capacity Control/ Constraints.
- Availability of Feedstock/ Control.

## Unit 5:

### Application to a Refinery Worksheet:

- Petroleum Product Movement and Product Exchange.
- Marginal Depot Supply and movements.
- Commonly Used Methods & Recent Developments.
- Mathematical Approach to Solution.
- Linear Programming, Graphic Method, Vendors Software.

## Unit 6:

### Crude Oil Yields Refinery Technology:

- Crude Oil Origins & Characteristics, Crude oil Assay and properties.
- Crude oil products, Product specifications.
- Gasoline, Kerosene/ Jet Fuel.
- Fuel Oil/ Diesel Fuels, Petrochemical Feedstocks.
- Refineries Complexity.
- Overall refinery flow: Interrelationship of processes.

## Unit 7:

### Petroleum Refinery Processes:

- Crude Processing, Desalting.
- Atmospheric distillation, Vacuum distillation.
- Heavy Oils Processing - Coking and Thermal Processes.
- Delayed Coking, Fluid Coking, Flexicoking.
- Visbreaking.

## Unit 8:

### Process for Motor Fuel Production:

- Fluid catalytic cracking.
- Hydrocracking.
- Cat Cracking.
- Isomerization, Alkylation.
- Hydrotreating, Catalytic Reforming.

## Unit 9:

### Supporting Operations:

- Blending for Product Specifications.
- Hydrogen production.
- Refinery Gas Plants.
- Acid Gas Treating.
- Sulfur Recovery Plants.

## Unit 10:

### Refinery Economics:

- Residue Reduction.
- Asphalt and Residual Fuel.
- Cost Estimation.
- Economic Evaluation.