

# € TRAINING

Mastering Petroleum Refinery Operations





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## Introduction:

This training program provides comprehensive instruction on the intricacies of refining operations, focusing on planning, scheduling, and yield optimization. This program equips professionals with the skills and knowledge necessary to enhance refinery efficiency, reduce quality giveaways, and optimize production yields.

## Program Objectives:

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

- Gain an appreciation of production planning and scheduling tools for crude and product deliveries.
- Discover and understand the principles of scheduling optimization for efficient refining operations.
- Learn skills for crude selection and optimization to enhance profitability.
- Develop blending techniques using Excel for improved product quality.
- Familiarize with various refinery types and their impact on refining optimization.
- Comprehend the importance of quality giveaways and reduce them using practical Excel spreadsheets.
- Utilize hands-on software for choosing crude diets to optimize refinery efficiency and profitability.

## Targeted Audience:

- Refining professionals working in the industry, such as technologists and operations engineers.
- All professionals involved in Production, Planning, and Scheduling.
- Process engineers and technologists engaged in planning and scheduling activities.
- Operations personnel, including shift supervisors.
- Marketers, refinery planners, and blending professionals.
- Engineers seeking a deeper understanding of refining processes.
- Accountants, marketers, and other professionals interested in Production Planning & Scheduling in Petroleum Refineries.

## Program Outlines:

## Unit 1:

### Refinery Configuration and Planning:

- Understanding Hydro skimming Refinery.
- Exploring Refineries with Secondary Conversion Process.
- Analyzing Integrated Refineries.
- Evaluating Existing & New Refineries.
- Considering Choice of Crude and Crude oil scheduling.
- Assessing Capacity utilization of Crudes and the severity of Process Operations.

## Unit 2:

### Product Movements and Tankages Management:

- Gathering Basic Information Required for Product Movements.
- Analyzing Crude Assay and Intermediate Feed Characteristics.
- Managing Yields and Properties across Different Process Units.
- Optimizing Product Blending Rules considering Product Specifications and Environmental Issues.
- Evaluating Utilities for Improved Product Movements and Tankages Release.

## Unit 3:

### Problem Formulation and Solution Approaches:

- Understanding Refinery Flow-sheets and Material Balance.
- Formulating Problem Statements and Demand Equations.
- Implementing Product Inventory Control and Quality Control.
- Exploring Capacity Control/ Constraints and Availability of Feedstock/ Control.
- Employing Mathematical Approaches like Linear Programming and Graphic Method.

## Unit 4:

### Crude Oil Yields and Refinery Technology:

- Understanding Crude Oil Origins, Assay, and Characteristics.

- Analyzing Crude Oil Products and Product Specifications.
- Exploring Refinery Complexity and Overall Flow Interrelationships of Processes.
- Evaluating Gasoline, Kerosene/Jet Fuel, and Fuel Oil/Diesel Fuels Production.
- Assessing Petrochemical Feedstocks and Refinery Economics for Yield Optimization.

## Unit 5:

### Petroleum Refinery Processes:

- Overview of Crude Processing and Desalting.
- Understanding Atmospheric and Vacuum Distillation.
- Analyzing Heavy Oils Processing - Coking and Thermal Processes.
- Exploring Delayed Coking, Fluid Coking, Flexicoking, and Visbreaking.
- Assessing the Impact of Petroleum Refinery Processes on Product Yields and Quality.

## Unit 6:

### Process for Motor Fuel Production:

- Exploring Fluid Catalytic Cracking, Hydrocracking, and Cat Cracking.
- Understanding Isomerization, Alkylation, and Hydrotreating.
- Assessing Catalytic Reforming for Motor Fuel Production.
- Managing Blending for Product Specifications and Hydrogen Production.
- Evaluating Refinery Gas Plants, Acid Gas Treating, and Sulfur Recovery Plants for Supporting Operations.

## Unit 7:

### Refinery Economics and Optimization:

- Residue Reduction Strategies for Improved Yield and Profitability.
- Asphalt and Residual Fuel Processing for Value-added Products.
- Cost Estimation Methods and Economic Evaluation Techniques.
- Analyzing Economic Factors Impacting Refinery Operations.
- Exploring Optimization Strategies for Enhanced Refinery Performance.

## Unit 8:

### Supporting Operations and Environmental Considerations:

- Blending Techniques for Environmental Compliance and Product Quality.
- Hydrogen Production Methods and Environmental Impact Assessment.
- Management of Refinery Gas Plants for Emissions Control.
- Acid Gas Treating Techniques for Sulfur Removal and Environmental Protection.
- Evaluation of Sulfur Recovery Plants for Regulatory Compliance and Environmental Sustainability.

## Unit 9:

### Recent Developments and Future Trends:

- Emerging Technologies in Refinery Configuration and Planning.
- Innovations in Product Movements and Tankages Management.
- Advancements in Problem Formulation and Solution Approaches.
- Latest Trends in Crude Oil Yields and Refinery Technology.
- Future Directions in Petroleum Refinery Processes and Motor Fuel Production.

## Unit 10:

### Case Studies and Practical Applications:

- Case Studies Illustrating Refinery Configuration and Planning Concepts.
- Practical Applications Demonstrating Product Movements and Tankages Management Techniques.
- Real-world Examples of Problem Formulation and Solution Approaches in Refinery Operations.
- Case Studies Highlighting Crude Oil Yields Optimization and Refinery Technology Applications.