



Mini-Master in Hydrocarbon Production  
Operations Training Course





# Mini-Master in Hydrocarbon Production Operations Training Course

## Introduction

This comprehensive mini-master course in hydrocarbon production operations is designed to equip participants with a holistic understanding of hydrocarbon production and the associated facilities throughout a reservoir's life.

The hydrocarbon production operations course offers an in-depth perspective on a variety of oilfield production handling and treatment equipment. The hydrocarbon production operations course sheds light on the fluid properties and their behavior from the reservoir to the end user.

The hydrocarbons in oil and gas course emphasizes the calculation of reserves and fluid properties en route from the reservoir via the gathering network. The hydrocarbons in oil and gas prepare surface facility engineers to design or manage the required equipment and infrastructure adeptly.

## Hydrocarbons in Oil and Gas

In this hydrocarbons in oil and gas course, we will discuss the significance of hydrocarbons within the realm of oil and gas, exploring what hydrocarbons are, their role in the industry, and the hydrocarbon production process. Understanding these foundational elements is crucial for grasping the complexities of hydrocarbon production operations.

## Targeted Groups

- Technologists
- Mechanical engineers
- Safety and Inspection engineers
- Operations, maintenance, or project engineers
- Anyone requiring a broad understanding of the structure, operations, and economics of the oil and gas industries

## Course Objectives

Upon completion of this extensive hydrocarbon training course, participants will:

- Explore global oil and gas-related statistics, including reserves, production, consumption, and exports.
- Learn about upstream, midstream, and downstream operations and the associated facilities.
- Gain insights into the exploration, drilling, production, treatment, and transportation methods and techniques of oil, gas, and their by-products.
- Comprehend the oil and gas operations involved in field facilities, including wellheads, flow lines, separators, tanks, pumps, compressors, pipelines, and gas treatment and processing.
- Grasp the elementary concepts of evaluating oil and gas reserves, artificial lift, and recovery enhancement.
- Recognize the challenges inherent in the industry, such as offshore operations, horizontal drilling, and elevated safety concerns.
- Develop a general understanding of petroleum economics and risk analysis.

## Targeted Competencies

At the end of this hydrocarbons in oil and gas course, the participants will be able to:

- Understand the role of petroleum economics in evaluating field development projects.
- Understand the role of the petroleum/reservoir engineer in optimizing recovery.
- Learn about details of oil and gas processing, including exploration, refining, storage transportation, and retailing.
- Understand the value chain from the well to the consumer.
- Understand the fundamental technologies of both upstream and downstream oil and gas industries.
- Learn about the ways the oil and gas industries are organized to operate effectively and efficiently.
- Develop the necessary skills to evaluate and make effective decisions related to the oil and gas industry.

## Course Content

### Unit 1: Introduction and Overview

- Global energy statistics.
- Hydrocarbon industry components.
- The upstream operations.
- Exploration methods.
- Seismic surveys.
- Drilling operations.
- Drilling problems and challenges.
- Testing and completion.
- Hydrocarbon production challenges.
- Well, stimulation and maintenance.

### Unit 2: Hydrocarbon Properties

- Rock properties.
- Porosity and permeability.
- Estimate hydrocarbon reserves.
- Oil and gas production.
- Artificial lift methods and facilities.
- Reservoir Drive mechanisms.
- Pressure maintenance technologies.
- Hydrocarbon recovery methods.
- Learn about primary, secondary, and tertiary recovery.
- Reservoir simulation.
- Oil and gas field surface facilities.

### **Unit 3: The Downstream Operations**

- Wellheads types.
- Production manifolds.
- GOSP facilities.
- Oil and gas separation.
- Emulsion treatment.
- Understand separator types, operation, and troubleshooting.
- Learn about oil treatment, storage, and transportation.
- Oil tank types.
- Gas treatment and processing.
- Process troubleshooting.

### **Unit 4: Heat Exchangers**

- Oil and gas measurement and control.
- Learn what Pipeline operation and pigging are.
- Valve types.
- Understand pumps and compressor stations.
- Refinery operations and products.
- Operational troubleshooting.

### **Unit 5: The Role of Technology**

- Safety and accident prevention.
- Production problems.
- Understand corrosion protection and cathodic protection.
- Scale prevention and treatment.
- Learn about petroleum economics and risk analysis.