



# THE CHEMICAL ENGINEERING MAJOR

## Hydrocarbon Production Operations

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# Hydrocarbon Production Operations

## Introduction:

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This course will provide the candidates with an integrated view of the hydrocarbon production and related facilities during the life of the reservoir. It will present an overview and a fundamental understanding of the wide range of oilfield production handling and treatment equipment. With this view and tools and knowledge on the properties and flow of the fluids provided in this training session, the participant will be able to understand the behavior of the fluids from the reservoir up to end users. The training gives strong emphasis of the calculation of reserves, fluids properties from reservoir through gathering network. This knowledge is necessary for the surface facility engineer to design or operate the equipment and facilities.

This course will provide an insight into the oil & gas field operation processes and the role of production engineering. It will explain the important concepts in reservoir and well drilling and intervention, productivity optimization, various recovery mechanisms, as well as covering various operational issues. Core Competencies are:

- Gain an overall knowledge of various hydrocarbon production processes from the time a reservoir is discovered to end users
- Understand the role of the petroleum/reservoir engineer in optimizing recovery

- Gain sufficient knowledge of various surface and sub-surface equipment and processing facilities used in a typical oil & gas field
- Gain sufficient knowledge about health, safety and environmental issues
- Understand the role of petroleum economics in evaluating field development project

## **Course Objectives:**

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**By the end of this course delegates will be able to:**

- Be familiar with global oil & gas related statistics, such as reserves, production, consumption and exports
- Learn about both upstream, middle stream and downstream operations and related facilities
- Familiarize the participants with various methods and techniques used to explore, drill, produce, treat and transport oil, gas and their products
- Understand the oil & gas operations of various field facilities from wellhead, flow lines, separators, tanks, pumps and compressors, pipelines, gas treatment and processing, refinery operations, etc
- Understand the basic concept with regards to evaluating oil & gas reserves, artificial lift and enhancing recovery
- Understand the challenge associated with this industry such as offshore operations, horizontal drilling and other safety concerns
- Get a general feel for petroleum economics and risk analysis
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## Course Outline:

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- Introduction and Overview
- Global Energy Statistics
- Hydrocarbon Industry Components
- The Upstream Operations
- Exploration Methods
- Seismic Surveys
- Drilling Operation
- Drilling Problems & Challenges
- Well Testing, Completion
- Hydrocarbon Production Problems
- Well Stimulation & Maintenance
- Hydrocarbon Properties
- Rock Properties
- Porosity & Permeability
- Estimating Hydrocarbon Reserves
- Oil & Gas Production
- Artificial Lift Methods & Facilities
- Reservoir Drive Mechanisms
- Pressure Maintenance Technology
- Hydrocarbon Recovery Methods
- Primary, Secondary & Tertiary Recovery
- Reservoir Simulation
- Oil & Gas Field Surface Facilities
- The Downstream Operations
- Wellheads Types

- Production Manifolds
- GOSP Facilities
- Oil & Gas Separation
- Emulsion Treatment
- Separator types, Operation & Troubleshooting
- Oil Treatment, Storage & Transportation
- Oil Tank Types
- Gas Treatment & Processing
- Process Troubleshooting
- Heat Exchangers
- Oil & Gas Measurement and Control
- Pipeline Operation & Pigging
- Valve Types
- Pumps & Compressor Stations
- Refinery Operations & Products
- Operation Troubleshooting
- The Role of Technology
- Safety & Accident Prevention
- Production Problems
- Corrosion Protection & Cathodic Protection
- Scale Prevention & Treatment
- Petroleum Economics & Risk Analysis