

# Drilling & Completion Technology



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## Introduction:

This course is intended to cover different aspects of crude oil production right from the exploration stage. The course will cover exploration, drilling technology, various types of well completion and testing methods, artificial lift, reservoir pressure maintenance practices, work-over, well stimulation and production.

Deep-water Technology, being latest, is also included. The theory and practical aspects of geology, completion in horizontal and vertical well, multilateral wells, rig layout- components, various types of fluids used in drilling, work-over operations, and various well stimulation techniques will be discussed.

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody to find the right answers. The candidates will also be encouraged to raise their own questions and share in the development of the right answers using their own analysis and experiences.

## Objectives:

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

- Review the basics of geology of the suitable rocks for favorable deposition of hydrocarbons.
  - Understanding the basics of drilling technology.
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- In depth study of the well completion and various modes of testing.
  - Production from depleted zones by means of suitable modes of Artificial Lift
  - Reservoir management.
  - Imparting knowledge of well repair and damage control.
  - Highlight the frontier area of offshore technology including Deep Water.

## Who should attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production and Completion Engineers, Foremen, Industry Personnel.


## Course Outline:

### Introduction to Drilling Technology:

- Terms and nomenclature of geology used in oil industry
- Petroleum: How it is formed and trapped
- Geology of the suitable rocks for favorable deposition of hydro-carbons

- Introduction to seismic survey
- Technical Definitions
- Rotary Drilling practices
- Well Construction and Design of Casing String
- Drilling fluids
- Well control Equipment
- Fishing and fishing Tools
- Offshore drilling Practices
- Safety on the rig

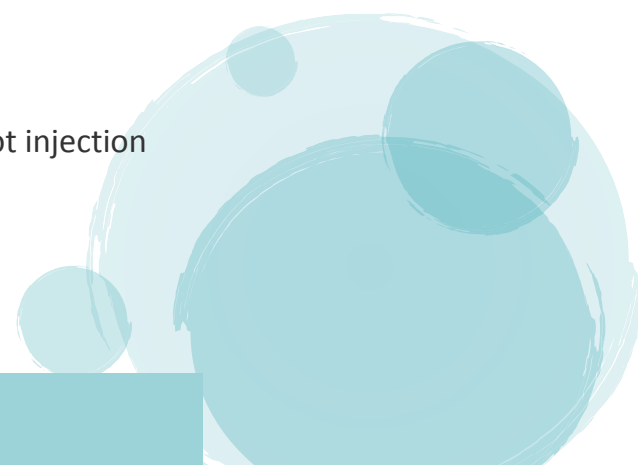
### Well Completion & Testing:

- Reservoir engineering aspects for well completion and testing
  - Objectives of well testing
  - Classification of well production test
  - Various steps in well test program
  - Basis of completion design
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- Types of well completion: open hole completion,
- Cased hole completion, examples of typical offshore well completions
- Slotted liner completion
- Artificial Lift : SRP, ESP
- Gas Lift and Hydraulic lift completion
- Horizontal and multilayered completion
- Tail Pipe completion

- Perforation Techniques: over balanced and under balanced
- Well head equipment
- Down hole tools
- Well activation and flow measurements
- Well Test Concepts.

### **Artificial Lift & Reservoir Pressure Maintenance**


- Need for artificial lift
  - Various modes of lifts
  - Selection criterion and design of suitable lift
  - Trouble shooting
  - Optimization
  - Need for reservoir health management
  - Types of water injection methods, peripheral and spot injection
  - Frontier areas of EOR
  - Compatibility of injection fluids, Monitoring
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## **Work-Over: Rig Components & Well Stimulation**

- Introduction
- Rig components
- Draw works
- Hoisting System
- Rotary equipment
- Mud Pumps
- Prime over
- Work over Jobs

- Routine Servicing of the wells
- Usage of work-over fluids
- Main Repair Jobs
- Water and gas shut-off
- Casing Damage repair
- Fishing, Formation damage
- Various stimulation techniques
- Gravel packing
- Activation

## **Surface Facilities: Production & Offshore Practices**

- Introduction to Group Gathering Stations
  - Layout of GGS/GCS/ EPS/CTF
  - Sour component handling
  - Oil, Gas and water separation
  - Demulsification and desalting
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- Functioning of Heater Treater
- Overview of offshore process platforms
- Introduction to offshore technology
- Deep water: frontier area of technology
- Case Studies