

## Modern Petroleum Geology for Non Geologists

### Training Program



### Introduction:

This course provides the candidates with a technical overview of the science and art of geology including drilling operations, completion practices and post-completion wellbore enhancement or remedial workover techniques (well intervention). It develops an understanding of the what, why, and how of each of these areas of engineering practice. Reservoir engineers will learn what can be done within open-hole and cased wells as they execute reservoir management. Drilling and completion personnel will learn how the producing reservoir can be damaged or stimulated by what they do. The candidates will learn to visualize what is happening "downhole", discover what can be accomplished and gain an appreciation for wellbore risks and the possibility of damage to the formation; and how drilling and completion practices can alter reservoir interpretation and performance. The candidates will become conversant with specific technical terminology and aware of practical applications, which should enhance communication and interaction between disciplines.

### Who Should Attend?

Geologists, Geophysicists, Petrophysicists, Stratigraphers , Reservoir, Petroleum, Wellsite Geologists, Petroleum Engineers, Drilling Engineers, Reservoir Engineers, Production Engineers, Operations Engineers, Technologists, Log Analysts, E&P Personnel, Exploration & Development Personnel, Geologists, Reservoir Engineers, Seismic Interpreters, E&P Managers, Oil & Gas Personnel

### Course Objectives:

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

- Gain understanding of the petroleum business process from exploration geology, prospect evaluation, development, and production
- Learn about the fundamental knowledge on petroleum geology from the formation of oil and gas, characteristics of petroleum systems, and the use of geological data in petroleum exploration

- Apply the knowledge of petroleum geology for better business decisions in negotiations and appraisal process
- Integrate geological data information to evaluate the potentiality for new business ventures
- Understand the technical complexity of exploration before setting up the rules to limit or maximize operations of the technical team in a petroleum project

## Course Outline:

### Petroleum Business Process

- General Worldwide Government Requirements for Exploration Permits
- Joint Operation Agreements, Oil/Gas Pricing, Oil/Gas Sales

### What is Geology?

- Definition, Origins & The History of the Earth, Geological Time
- Common Rocks and Minerals, What are Fossil Fuels (Hydrocarbons)?
- Chemical Composition, Hydrocarbons in, Crude Oil
- Natural Gas, Condensates

### Petroleum Exploration

- Role of Geoscientists, Geological Techniques, Wellsite Geology (Sampling/Core Drilling)
- Subsurface Mapping, Geochemical Techniques, Basin Modeling
- Prospect Maturation & Correlation, Geophysical Techniques
- Seismic Interpretation, Gravity & Magnetism, Seismic Imaging
- Sequence Stratigraphy, Seismic Attributes
- Non Seismic Tools, Hydrocarbon Seepage Analysis

### **Deposition Environments (Sedimentary Rocks)**

- Stratigraphy, Sedimentary Rock Distribution
- Basin Formation, Sedimentary Rock Facies, Unconformities

### **Tectonics (Plate Tectonics)**

- Deformation of Rocks, Antiforms, Synforms, Faulting Mechanisms

### **Hydrocarbon Generation, Migration, and Accumulation**

- Source Rocks, Migration, Reservoir Rocks, Roles of Traps in Reservoir Evaluation
- Structural Traps, Stratigraphic Traps, Combination Traps
- Considerations of the Origin, Migration, & Accumulation for Oil Shales & Tar Sands

### **Mapping**

- Topographic Maps, Geologic Maps, Base Maps, Subsurface Maps

### **Prospect Generation**

- Foundation for Exploration, Integrating Technical Geological Data to
- Legal Restrictions Generation

### **Development of Agreements**

- How are Agreements Developed in the Exploration Side?
- International Standards in Recovery Investments, Cost Recovery of Private Sector

## **Drilling**

- Types of Wells, Site Preparation, Rotating, Hoisting, & Circulating System
- Types of Drilling, Well Site Geology/MudLog, Wire Logs
- Drill Stem Testing (DST), Repeat Formation Tester

## **Drilling Administration & Negotiations**

- Admin Aspects, Government Regulations, Land & Leasing
- Authority for Expenditure, Drilling Contracts

## **Completing a Well**

- Casing, Bottomhole Completions, Tubing, Wellhead, and Chokes
- Surface Equipment, Multiple Completions, Intelligent Wells

## **Production**

- Reserves Calculations, Types of Reserves, Recovery Factor
- Maximum Efficient Rate, Well Stimulation, Production Logs
- Decline Curves, Production Maps, Improved Oil Recovery
- Storage, Measurement, & Transportation, Commercial Lift of a Well

## **Reservoir Acquisitions & Due Diligence**

- Proven Reserves Estimations, Possible Reserves, Production History & Production Cost

## **Decommissioning & Rehabilitation**

- Planning for Decommissioning, Legal & Environmental Considerations