

# EXPLORATION GEOPHYSICS FOR GEOLOGISTS AND ENGINEERS

## GEP003

### COURSE DESCRIPTION

In modern exploration for oil and gas, geophysics is a key to success, particularly in offshore and frontier areas. Contemporary geophysics (seismic) provides the necessary technology to remote-sense the target to reduce the exploration drilling risk. Seismic also plays a significant role in reservoir characterization and development.

Geologists and Engineers have learned to visualize and quantify rock properties from their physical properties graphically represented in well logs. The challenge is to become equally comfortable with seismic data. The seismic trace can be considered as an additional log which, on the one hand comes by the thousand, yet on the other, does not have the resolving power of the sonic or density log.

### COURSE GOAL

To enhance the participants' knowledge, skills and abilities necessary to a better understanding of principles relating to seismic, gravity, and magnetic methods. Beside the principles of these methods, it provides the field acquisition, procedures, data processing and data reduction and methods of interpretation.

### COURSE OBJECTIVES

By the end of the course, participants will be able to:

- Understand the principles of seismic, gravity, and magnetic methods in petroleum exploration.
- Learn about wave propagation, data acquisition, processing, and interpretation techniques in the seismic method.
- Gain knowledge of 3D seismic and seismic stratigraphy for reservoir characterization.
- Comprehend the principles of the gravity method and its application in field operations, data reduction, and interpretation.
- Familiarize yourself with the principles of the magnetic method and its use in field operations, data reduction, and interpretation.
- Recognize the benefits of seismic data in exploration and reservoir characterization.
- Acquire skills in analyzing and interpreting rock properties using seismic data.
- Enhance knowledge of different gravity and magnetic maps and sections.
- Understand the role of aerial magnetic surveys in geophysical exploration.
- Benefit from the course as a petroleum geologist, engineer, or junior geophysicist, regardless of experience level.

## WHO SHOULD ATTEND

Petroleum Geologists, Engineers and Junior Geophysicists of any length of experience will find this course of significant benefit in understanding seismic fundamentals and will learn the advantages of seismic data in exploration and reservoir characterization.

## COURSE DURATION

5 Working Days

## COURSE OUTLINES

### 1. The Main Geophysical Methods in Petroleum Exploration

### 2. The Seismic Method

- Principles, wave propagation.
- Data acquisition.
- Processing.
- Interpretation.
- 3D- seismic, seismic stratigraphy.

### 3. The Gravity Method

- Principles.
- The earth's gravitational field.
- Field operation.
- Data reduction.
- Different gravity maps and sections.
- Interpretation.
- Borehole Gravity.

### 4. The Magnetic Method

- Principles.
- The earth's magnetic field.
- Field operation.
- Data Reduction.
- Different magnetic maps and sections.
- Interpretation.
- Aerial Magnetic.