

## FUNDAMENTALS OF GEOLOGY

### General:

Discipline: Geology

Level: Basic

Duration: 5 days

Instructor(s): Juan Klimowitz

### Purpose:

This is an introduction to exploration geology, petroleum systems and petroleum geology. The objectives are to introduce the concepts and principles for the petroleum geology from exploration, appraisal basis knowledge for the best reservoir development.

### Designed for:

Beginners geoscientists, geophysics, geology, petrophysics, engineers, reservoir, production.

### You Will Learn:

How to:

- Understands the nature of hydrocarbons.
- Understands the Basic Dynamics of Sedimentary Basins
- Knows the physical concepts related to the subsurface environment of a reservoir.
- Understands the basic concepts the Petroleum Play, Generation, Migration, Reservoir, Trap and Seal
- Knows the kinds of methods of exploration.
- Knows the trap forming mechanisms in different tectonic settings.

### Course Content:

Sedimentary basins

- Mechanisms of basin formation
- Classification of sedimentary basins
- The Sedimentary Basin Fill Sediment supply, Subsidence and Basin Fill Starving and Overfeeding Up-and Out-building (aggradation & progradation)
- Basins and Tectonic Plate margins
- Sequence Stratigraphy

The Nature of Hydrocarbons.

- Carbon and Organic matter
- Crude Oil, Natural Gas and others
- Sedimentation rates and Organic Matter Instantaneous and average rates Organic matter: Supply and Preservation

Introduction to the Elements of the Petroleum Play

- The Petroleum Charge: Source, Migration and Preservation Source rocks, quality and maturation Expulsion and migration pathways, timing
- The Reservoir types, Geometry and Continuity Porosity, Permeability, and Pressures,
- The Trap types and statistics

- The Seal The mechanics of sealing Geometry of the trap and sealing requirements
- Non-conventional Petroleum & Gas System

#### Methods of exploration

- Well drilling
- Geophysical methods of exploration.
- Subsurface geological maps

#### Structural Styles.

- Overview of the principal structural styles (extensional, compressional, strike-slip & salt tectonics),

#### Software applications:

- Microsoft Office

#### Text and consulting books:

- "Elements of Petroleum Geology" Richard C. Selley Academic Press. 1998
- "Petroleum Geochemistry and Geology" John M. Hunt W.H. Freeman, 1996
- "Applied Subsurface Geological Mapping" D. J. Tearpock and R.E. Bischke Prentice Hall, 1991

