BASIN ANALYSIS & HABITAT OF HYDROCARBONS IN SEDIMENTARY BASINS

EXP005

COURSE DESCRIPTION

This course provides the format for genetic classification of sedimentary basins, drawing together the principles of the previous six modules into the evaluation of the earth's plate tectonic framework. It explains identification and classification of sedimentary basins, their role in forming oil and gas, and the habitats of oil and gas within them. In addition, the course identifies the important elements essential to analyse the potential of the basin qualitatively and quantitatively and provides the systematic techniques of basin analysis to evaluate and develop the oil and gas exploration program of the basins.

COURSE GOAL

To enhance participants' knowledge, skills, and abilities necessary to evaluate the sedimentary basin and determine its petroleum potential.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Identify the important elements essential to analyze the potential of the basin qualitatively and quantitatively.
- Understand of the exploration plays expected in the basin.
- Classify of the basins and its potential for oil and gas discoveries.
- Employ the systematic techniques of basin analysis to evaluate and develop the oil and gas exploration program of the basins.
- Evaluate and improve modelling the different basins and enhances evaluation of new exploration plays and prospects.

WHO SHOULD ATTEND

Exploration and Production Geo-scientists, Petroleum and Reservoir Engineers, Managers, Supervisors and Petroleum Economists.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Review of exploration concepts
    - Introduction to the key concepts and principles of petroleum exploration.
    - Overview of exploration methods and techniques.
2. Geological situations where petroleum accumulations are possible
    - Understanding the geological conditions necessary for the formation and accumulation of petroleum.
    - Exploration targets and criteria for identifying prospective areas.
3. Geodynamics and geothermics of basin evolution
    - Study of the dynamic processes that shape sedimentary basins over geological time.
    - The role of heat flow and thermal history in basin development.
4. The impact of plate tectonics on basin formation
    - Examination of plate tectonic theory and its influence on the formation of sedimentary basins.
    - Relationship between plate boundaries, basin architecture, and hydrocarbon potential.
5. Different basin types
    - Review exercises: Practical exercises and case studies to reinforce understanding.
    - Petroleum characteristics by basin type: Examining the unique petroleum characteristics associated with different basin types.
    - References and additional information: Resources for further study and exploration.
6. Depositional systems analysis
    - Analysis of sedimentary depositional systems and their implications for hydrocarbon reservoir development.
    - Identification of depositional environments and their influence on the distribution of oil and gas.
7. Sequence stratigraphic analysis
    - Introduction to sequence stratigraphy and its application in understanding basin architecture and sedimentary processes.
    - Sequence stratigraphic framework and its role in identifying potential hydrocarbon reservoirs.

8. Subsidence analysis
    - Examination of subsidence processes and their impact on basin formation and evolution.
    - Understanding the factors controlling subsidence rates and their implications for hydrocarbon exploration.
9. Geo-historical analysis
    - Study of the geological history of sedimentary basins and its relevance to hydrocarbon exploration.
    - Reconstruction of paleoenvironments and paleoclimate conditions.
10. Tectonic processes involved in the development of sedimentary basins
    - Exploration of the tectonic forces and processes that shape sedimentary basins.
    - Relationship between tectonic settings, basin architecture, and hydrocarbon prospectivity.
11. Sedimentary basins
    - Overview: Introduction to sedimentary basins and their significance in hydrocarbon exploration.
    - Cratonic basins: Examination of basins developed within stable continental interiors.
    - Divergent margin basins: Study of basins formed at divergent plate boundaries.
    - Convergent margin basins: Analysis of basins associated with convergent plate boundaries.
    - Downwarp basins and tertiary deltas: Investigation of basins formed by subsidence and sediment deposition.
12. The role of sedimentary basins in forming oil and gas
    - Understanding the geological processes and conditions that lead to hydrocarbon generation and accumulation.
    - Exploration models and theories for the formation of oil and gas deposits in sedimentary basins.
13. Use of geochemistry in regional evaluation and basin analysis
    - Application of geochemical techniques to assess petroleum potential and evaluate basin characteristics.
    - Geochemical indicators for hydrocarbon source rock, maturity, and migration pathways.