Introduction to Basin Exploration

5 days **GENG/INFOBAS**

Overview

LEVEL

Foundation

PURPOSE

This course provides a practical knowledge of petroleum exploration. It aims to develop required competencies for an effective participation in multidisciplinary project teams.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

understand exploration strategy and follow the standard exploration workflow,

get familiar with most common exploration techniques, via a multidisciplinary approach and data integration,

acquire requested competences for basin analysis in order to assess the hydrocarbon potential and identify potential plays and related prospects.

WAYS AND MEANS

Short daily lectures followed by exercises and hands-on sessions.

Both individual work (exercises) and team work (short case study).

LEARNING ASSESSMENT

Knowledge assessment with multiple choice questions and open explanatory questions.

PREREQUISITES

No prerequisites for this course.

Agenda

BASIN EXPLORATION CHALLENGES, STRATEGY & WORKFLOW — 1 d

Basin potential evaluation, play concept assessment and prospect generation.
Risk analysis. Probability of success.
Prospect ranking. Decision-making process. License block leasing.
Examples.

BASIN EXPLORATION METHODS & TOOLS — 3 d

Basin analysis:
Geodynamics: earth deformation and basin structuration (extensional & compressional).
Review of geological environments and related reservoir distribution.
Sedimentary basins: sediment infill and associated traps (structural & stratigraphic).
Hands-on practice on real examples.
Petroleum systems:
The petroleum trilogy: source rocks, reservoir rocks and seal rocks.
Source rock potential and maturity evaluation: hydrocarbon generation.
Structural evolution, hydrocarbon expulsion, migration and entrapment, relative timing of events.
Hands-on practice on real examples.

Seismic interpretation:
Review of acquisition techniques.
Seismic interpretation: objectives and methodology.
Structural interpretation of basins in extensional and compressional contexts.
Stratigraphic interpretation of basin fill.
Hands-on practice on real examples.
Well log analysis:
Wireline log acquisition and well log analysis.
Review of logging tools and recorded parameters.
“Quick-look” qualitative well-log interpretation.
Hands-on practice on real examples.

EVALUATION OF BASIN PETROLEUM POTENTIAL

1 d

Basin potential evaluation: tectono-stratigraphic framework, petroleum trilogy, entrapment, migration and timing.
Play assessment and mapping for exploration opportunities. Sweet spots identification.
Prospect definition and related geological risk analysis (“Prospect review card”).
Workshop on a case study.