Petrogenium. Academy

Upstream General E&P

Basic Petroleum Geology

Consultant / Trainer

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Petrogenium (in collaboration with EPTS) Basic Petroleum Geology course participants will gain a comprehensive understanding of the subsurface, which is essential for making informed engineering and operational decisions. This knowledge helps optimize drilling operations, reduce risks, and improve safety by identifying geological hazards such as faults and overpressure zones. The training emphasizes the importance of integrated teamwork, ensuring participants appreciate how geology, drilling, facilities engineering, and economics must work together for successful field development.

Participants

Petroleum engineers, well-site engineers, geologists and geophysicists at the start of their careers.

Learning Objectives

At the end of the course participants will understand the principles of oil and gas generation, migration and trapping. They will be introduced the exploration processes and tools, learn the basics of rock properties, well log evaluation and log correlation. They will be able to apply geological concepts, construct maps and sections and use geological and geophysical data to make subsurface evaluations and to calculate oil and gas volumes.

They will learn how to prepare a well proposal and how to make a basic casing design based on subsurface pressures. They will understand the field appraisal and development process and will acquire practical experience by working on an actual field development plan in teams. Production facilities and costs will be briefly discussed, to allow economic assessment of their project at the end of the course.

Programme

Day 1

Focus on the energy business, development projects, geology concepts

- Introduction of participants and trainer, course program
- Scope of the energy / oil & gas business
- History of the oil & gas business, technology breakthroughs
- Major players in the industry
- Activities in E&P
- Global energy resources
- Oil price review and scenario's
- Global issues, PR and environment
- General process of oil & gas development projects, project life cycles
- Team exercise: Offshore Field Development Project 1: Commercial, Environmental and PR issues, Exploration bid proposal. Given a description of the project activities and the geographical environment, make an outline of a bid proposal
- Concepts of petroleum geology: Hydrocarbon basins, plays, plate tectonics, sedimentary cycles and sequences, sequence stratigraphy, origin of hydrocarbons, source rocks and maturity, hydrocarbon traps
- Seismic principles: data gathering, processing and interpretation

Day 2

Focus on exploration, subsurface models: appraisal, drilling, well data.

- Recap day 1
- Exploration tools, basin analysis
- Drilling process, horizontal wells, risks
- Offshore field exercise 2: field appraisal planning
- Log and core data, reservoir properties, reservoir maps
- Offshore field exercise 3: Discussion of appraisal results, correlation of appraisal wells

Programme

Day 3

Focus on subsurface models: structural styles, sedimentary environments, pressures

- Recap day 2.
- Structural styles, traps, seals, structural maps and sections
- Offshore field exercise 4: structural map based on seismic and appraisal wells
- Sedimentary environments, sedimentary models, reservoir mapping exercise
- Offshore field exercise 5: Net sand calculation from logs, net sand mapping
- Subsurface pressures

Day 4

Focus on volumetrics, surface development options, well completions

- Recap day 3
- Offshore field exercise 6: pressure analysis, fluid contacts
- Reservoir fluid properties and pressures, reservoir engineering
- Volumetric calculations, subsurface uncertainties
- Offshore field exercise 7: field volumetric calculations and uncertainties
- Subsurface development planning, well completion technology

Day 5

Focus on surface development options, project economics

- Recap day 4
- Faults, fault seal analysis
- Offshore field exercise 8: subsurface development options
- Carbonate reservoirs
- Production facilities and operations
- Basics of project economics
- Offshore field exercise 9: Project conclusions, economic calculations and economic effects of (subsurface) uncertainties
- Course review and round-up