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FUNDAMENTALS OF PETROLEUM GEOMECHANICS

Start Date:	26/04/2026	**End Date:**	30/04/2026
Categories:	Oil & Gas	**Venues:**	Doha
Formats:	In Person	**Instructors:**	

OVERVIEW

This technical course introduces participants to the fundamental principles of petroleum geomechanics and its critical role in drilling, reservoir management, and wellbore stability. It focuses on understanding rock mechanical behavior, stress analysis, and the application of geomechanical models to optimize oil and gas exploration and production operations while mitigating subsurface risks.

OBJECTIVES

By the end of this course, participants will be able to: – Understand the key concepts of rock mechanics and stress-strain relationships in petroleum reservoirs. – Analyze in-situ stress fields and their impact on drilling and reservoir operations. – Apply geomechanical principles to predict and prevent wellbore instability, sand production, and hydraulic fracturing issues. – Integrate geomechanical models into well planning, drilling design, and production strategies. – Evaluate and mitigate geomechanical risks to enhance drilling safety and reservoir performance.

COURSE OUTLINE

1- Introduction to Rock Mechanics and Petroleum Geomechanics 2- In-Situ Stress, Pore Pressure, and Fracture Gradient Analysis 3- Wellbore Stability, Sand Production, and Hydraulic Fracturing Mechanics 4- Building and Calibrating Geomechanical Models for Field Applications 5- Geomechanics Integration into Drilling, Completions, and Reservoir Management

TARGET AUDIENCE

All Supervisory Levels, Drilling Engineers, Reservoir Engineers, Geoscientists, Production Engineers, Completion Engineers, Petroleum Engineers, and technical specialists involved in subsurface operations and field development planning.

METHODOLOGY

The course combines technical lectures, case study reviews, geomechanical modeling demonstrations, practical exercises in stress analysis, and group discussions focused on field applications of petroleum geomechanics.

CONCLUSION

Upon completing the course, participants will be equipped with a strong foundation in petroleum geomechanics, enabling them to identify and address subsurface mechanical challenges, improve wellbore stability, optimize drilling operations, and enhance overall field development strategies.

DAILY AGENDA

Day 1: Introduction to Petroleum Geomechanics and Rock Mechanics

Explore the principles of rock mechanics, stress-strain behavior, and the significance of geomechanics in oil and gas operations.

Day 2: Understanding In-Situ Stress, Pore Pressure, and Fracture Gradients

Analyze subsurface stress conditions, pore pressure profiles, and fracture gradient models critical for well planning.

Day 3: Wellbore Stability and Sand Production Control

Learn to predict, diagnose, and prevent wellbore collapse, sand production, and related drilling and completion challenges.

Day 4: Building and Applying Geomechanical Models

Develop basic geomechanical models and use them to inform drilling trajectories, casing programs, and completion designs.

Day 5: Integration of Geomechanics into Field Development

Apply geomechanical insights to optimize reservoir management, enhance hydraulic fracturing operations, and ensure operational safety.

For more information, please contact us:
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