JUPITER PRIME
Consulting • Training • Advisory
جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Drilling Geomechanics and Wellbore Stability Training Course

14 – 18 March 2027
Doha

Drilling Geomechanics and Wellbore Stability Training Course

Ref: 2370_88952 **Date:** 14 – 18 March 2027 **Location:** Doha **Fees:** 6500 GBP

Drilling Geomechanics and Wellbore Stability is a 1-week training course for drilling engineers, well engineers and geoscientists, built around a wellbore stability and mud weight window assessment. Deeper, depleted and highly deviated wells leave narrower margins between collapse and losses, so stress-aware planning now separates trouble-free sections from costly non-productive time. Jupiter Prime Training delivers this course on drilling geomechanics and wellbore stability.

Why Drilling Geomechanics and Wellbore Stability Matters Now

Three pressures meet at the bit. Asset owners drill longer laterals and infill wells through depleted reservoirs, where pore pressure has fallen but overburden has not. Contractors paid on footage and uptime feel every stuck pipe and lost return. Subsurface teams hold logs, core and leak-off data that rarely reach the well plan in time. An operator that joins these sources drills safer sections with fewer casing strings; one that ignores them faces sidetracks, kicks and lost hole. The course rests on the mechanical earth model MEM, effective stress theory and rock failure criteria.

Who Gains Most from Drilling Geomechanics and Wellbore Stability

- Engineers who set casing points, mud weights and trajectories for new wells
- Geoscientists who supply pore pressure, lithology and fault interpretations to well planners
- Petrophysicists who turn sonic and density logs into rock strength profiles
- Drilling fluid specialists who choose mud density, chemistry and loss treatments
- Operations engineers who read cavings, torque and drag trends while drilling

A well delivery group gains most when its planners, geoscientists and fluids specialists build the same earth model together.

Drilling Geomechanics and Wellbore Stability Capabilities

Participants turn logs, leak-off tests and drilling events into a stress model that sets safe mud weights.

- Estimate vertical, minimum and maximum horizontal stresses from logs and leak-off tests — casing point selection
- Calculate pore pressure from sonic and resistivity trends — kick margin decisions
- Derive rock strength profiles from log correlations and core tests — collapse limit definition
- Build a mud weight window with shear failure and fracture limits — fluids and well control sign-off
- Weigh well azimuth and inclination against stress orientation — trajectory and sidetrack choices

- Diagnose cavings, losses and tight hole events against the model — real-time drilling response

Key Drilling Geomechanics and Wellbore Stability Terms

- Mechanical Earth Model — a depth profile of stresses, pore pressure and rock properties that predicts wellbore behaviour.
- Pore Pressure — the pressure of fluids held in rock pores, which sets the minimum mud weight needed to prevent influx.
- Effective Stress — total stress minus a share of pore pressure, the load that actually acts on the rock grains.
- Mud Weight Window — the density range between the collapse limit and the fracture or loss limit for a hole section.
- Breakout — elongation of the borehole wall caused by shear failure.
- Unconfined Compressive Strength — the axial load a rock sample can bear without side support before it fails.

Drilling Geomechanics and Wellbore Stability Day by Day

Day 1: Stress, Pressure and the Subsurface Setting

- Overburden Integration From Density Logs — Vertical Stress Profile
- Normal, Strike-Slip And Reverse Stress Regimes — Expected Failure Modes
- Pore Pressure Prediction From Sonic Trends — Kick Tolerance Margins
- Leak-Off And Extended Leak-Off Tests — Minimum Horizontal Stress Calibration
- Depletion Effects On Reservoir Stresses — Infill Well Fracture Limits

Day 2: Rock Strength and Failure

- Triaxial And Scratch Core Tests — Strength Calibration Points
- Log-Derived Elastic Moduli And Strength Correlations — Continuous Strength Profiles
- Mohr-Coulomb And Mogi-Coulomb Failure Criteria — Collapse Pressure Estimates
- Shale Hydration And Bedding Plane Weakness — Fluid Selection Choices
- Image Log Breakout And Tensile Fracture Reading — Stress Direction Evidence

Day 3: Building the Mechanical Earth Model

- Offset Well Data Gathering And Quality Control — Model Input Confidence
- One-Dimensional MEM Construction — Section-By-Section Stress Profiles
- Mud Weight Window Plotting — Casing Shoe Depth Choices
- Trajectory Sensitivity Polar Plots — Azimuth And Inclination Selection
- Uncertainty Bands On Stress Inputs — Contingency Casing Decisions

Day 4: Geomechanics While Drilling

- Cavings Shape And Volume Monitoring — Collapse Versus Loss Diagnosis
- Equivalent Circulating Density And Surge-Swab Limits — Tripping Speed Rules
- Lost Circulation Mechanisms And Wellbore Strengthening — Loss Material Choices
- Bit Selection Against Rock Strength And Abrasiveness — Rate Of Penetration Gains
- Real-Time Model Updates From Drilling Events — Mud Weight Adjustments

Day 5: Practising the Wellbore Stability Assessment

- Stress And Pore Pressure Profile For A Planned Well — Applying Day 1 Methods
- Strength Profile From Offset Logs And Core — Applying Day 2 Criteria
- Mud Weight Window And Trajectory Case — Applying Day 3 Model
- Drilling Event Response Matrix — Applying Day 4 Diagnostics
- Wellbore Stability And Mud Weight Window Assessment — Well Plan Input

Applying Drilling Geomechanics and Wellbore Stability After the Course

- Rebuild the mud weight window for a recent troubled section from offset logs and leak-off data.
- Run a cavings and losses review with the rig team and agree mud weight change triggers.

Drilling Geomechanics and Wellbore Stability Questions FAQ

What is drilling geomechanics and wellbore stability, and why does it matter now?

It is the use of stress, pore pressure and rock strength to keep a borehole open and intact. Depleted reservoirs and long laterals narrow safe mud weights, so stress-aware planning now decides whether sections drill cleanly or end in sidetracks.

Which roles gain most from drilling geomechanics and wellbore stability training?

Drilling and well engineers, geoscientists, petrophysicists and fluids specialists gain most.

How does drilling geomechanics and wellbore stability training differ from a drilling fluids course?

It starts in the rock rather than the mud. A fluids course covers mud chemistry and rheology; this one models stresses and rock failure to define the density limits any mud must respect.

What do you bring back from drilling geomechanics and wellbore stability training?

You bring back a worked stress and strength profile, a method for plotting mud weight windows, trajectory plots and an event response matrix.

Drilling Geomechanics and Wellbore Stability: The Way Forward

The wellbore stability and mud weight window assessment joins stress, pore pressure and strength profiles into safe density limits for each hole section. Its first use informs casing shoe depths and the mud plan for a new well. Well planners, geoscientists and rig supervisors use it. After the well is drilled, compare predicted and observed cavings and losses, then recalibrate the earth model.