ROCK MECHANICS AND WELL BORE STABILITY DRL021

COURSE DESCRIPTION

This course offers a comprehensive understanding of borehole stability issues through the application of modern Rock Mechanics techniques. Aimed at both drilling and petroleum engineers, the course aims to equip participants with the knowledge, skills, and ability to analyze wellbore stresses, rock mechanical properties, and their influence on wellbore stability, directional drilling, well completion design, and reservoir development. By the end of the course, participants will be able to apply rock mechanics fundamentals to describe well, reservoir, and production behavior, measure various rock mechanical properties under different confining pressures, and calculate safe mud weights. The five-day program covers a range of topics, including rock behavior, stresses and strains, drilling-induced stresses, stress transformations for horizontal and multi-lateral wells, failure criteria, triaxial rock testing, borehole rupture mechanics, hole collapse mechanisms, earth stress measurements, stuck pipe problems, designing optimal wells based on earth stresses, compaction effects, production impacts, and sand production.

COURSE GOAL

To enhance the participants' knowledge, skills, and ability necessary to gain a thorough understanding of wellbore stresses, principles of rock mechanics and wellbore stability.

COURSE OBJECTIVES

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

- Apply rock mechanics fundamentals to describe well, reservoir and production behavior.
- Define the following rock mechanical properties under various conditions of confining pressure.
- Describe how these properties influence wellbore stability, directional drilling considerations, well completion design and other aspects of reservoir development.
- Know how they are measured in the laboratory.
- Calculate safe mud weights.

WHO SHOULD ATTEND

- Drilling engineers
- Petroleum engineers.

COURSE DURATION

5 Working Days

COURSE OUTLINES

- Rock behavior and measurement of rock properties
- Basic stresses and strains
- Stresses due to drilling a well
- Stress transformations for horizontal and multi-lateral wells
- Mohr envelope
- Failure criteria
- Triaxial rock testing
- Borehole rupture mechanics
- Hole collapse mechanisms
- Safe mud weights envelope
- Earth stress measurements
- Stuck pipe problems
- Designing a perfect well with the earth stresses
- Effects of reservoir compaction
- Production effects
- Sand production