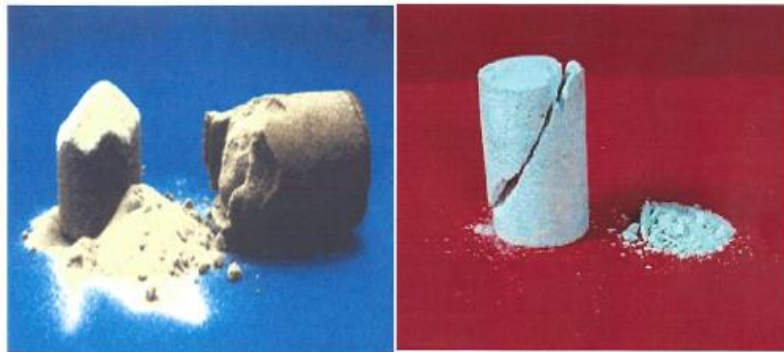


Theoretical and Practical Rock Mechanics

**"Better to Break the
Rock in the Lab., than
in the Hole"**



Soft Rock

Hard Rock

An In-House Training Short Course

By

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INTRODUCTION

This course provides participants with the theoretical and practical (laboratory) skills on how to apply rock mechanics principles in Petroleum, Mining, and Civil applications.

WHO SHOULD ATTEND

Petroleum, Civil, and Mining Engineers and Technicians, Geologists, Geophysicists, and Research & Development Staff.

COURSE DELIVERY FORMAT

DAY 1 (9am – 4 pm)

Session 1 (9-12)

- ✓ Introduction to Rock Mechanics.
- ✓ Rock Engineering Applications.
- ✓ Mechanical Behavior of Rocks.
- ✓ Coring and Core Analysis.
- ✓ Concept of Rock Failure.
- ✓ Laboratory Rock Testing and Characterization.

Session 2 (1-4)

- ✓ Tutorial on Unconfined Compression Test.
- ✓ Tutorial on Indirect (Brazilian) Tensile Test.
- ✓ Tutorial on Triaxial Compression Test.
- ✓ Tutorial on Evaluation of Poisson's Ratio and Young's Modulus.

DAY 2 (9am – 4 pm)

Session 1 (9-12)

- ✓ Linear Poro-Elasto-Plastic Solution of Stress State Around Boreholes.
- ✓ Yield Zone Theory Concept for Stress State Around Boreholes.
- ✓ Hydraulic Fracturing and Drilling Mud window Tutorials.

Session 2 (1-4)

- ✓ Rock Mechanics Applications in Oil Well Drilling.
- ✓ Rock Mechanics Applications in Oil Production Engineering.
- ✓ Other Applications.

COURSE LEARNING OBJECTIVES:

By the end of this course, participants are able to:

- ✓ Define Stress and Strain in Rocks.
- ✓ Understand Rock Engineering Projects and Mechanical Behavior of Rocks.
- ✓ Characterize Rock Deformation Modes, Rock Mechanical Properties. (Destructive and Non-Destructive), and Laboratory Tests.
- ✓ Derive and Utilize Linear-Poroelastic Solution of Stress on Deep Rocks.

- ✓ Understand and Utilize the Concept of Yield-Zone Theory.
- ✓ Understand and apply Mohr-Coulomb Failure Criterion and the Effect of Pore Pressure on Rock Strength.
- ✓ Calculate Mohr-Coulomb Failure Criterion Parameters and its Applications.
- ✓ Estimate Young's Modulus and Poisson's Ratio Using Experimental Data.
- ✓ Estimate of Mohr-Coulomb Failure Parameters Using Correlations.
- ✓ Utilize the Gained Rock Mechanics Knowledge in Rock Mechanics Applications in Petroleum Engineering Practices.

COURSE MATERIALS and COST:

- ✓ Registered participants will be provided with hard copies, pdf, and power point files of the course materials.
- ✓ Cost of the course delivery and course material hard copies will be negotiated upon request.
- ✓ The course will be delivered in-house.