

Advanced Hydraulic Fracturing

COURSE DESCRIPTION

The course provides the knowledge and tools needed to design and analyze hydraulic and acid fracturing jobs. An overview of the fundamental of rock mechanics and its application to hydraulic fracturing will be presented. Then, the data requirements and various elements of massive hydraulic fracturing treatment design are covered in detail. Finally, the design of fracture treatment using analytical tools and commercial simulators is discussed in detail. The course concludes with a term project to design a fracturing treatment and evaluate the post treatment performance of the well.

DISCIPLINE

Production &
Operations

COURSE DURATION

5 Days

DELIVERY METHOD

In-house

COURSE CONTENTS

- Role of Well Stimulation in Productivity Enhancement
 - ✓ Well-fracture-reservoir system
 - ✓ Proppant number and its effect on well performance
 - ✓ Fracture conductivity
 - ✓ Fracture design considerations
- Acid Fracturing
 - ✓ Acid fracture conductivity
 - ✓ Diversion in acid fracturing
 - ✓ Reservoir Simulation Problem – Carbonate
 - ✓ Acid Fracture Simulation Problem – Carbonate
- Fracture Mechanics
 - ✓ Linear elasticity and fracture mechanics
 - ✓ Fracturing fluid mechanics
 - ✓ Leak off and volume balance in the fracture
 - ✓ Basic fracture geometry
 - ✓ Fracturing of high permeability formations
 - ✓ Fracturing horizontal well in high permeability reservoirs
 - ✓ Leak off models
 - ✓ Fracture and non-Darcy flow
 - ✓ Fracture propagation, toughness, and tip effects
 - ✓ Reservoir Simulation Problem – Sandstone

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- Fracturing Materials
 - ✓ Fracturing fluids
 - ✓ Fracturing fluid rheology
 - ✓ Fracturing fluid additives
 - ✓ Proppant types and proppant selection
 - ✓ Impact of proppant and fluid type on the fracture conductivity
 - ✓ Fracture Fluid Recycling
- Fracture Treatment Design
 - ✓ Micro-fracture Test
 - ✓ Mini-fracture test
 - ✓ Optimum treatment design
 - ✓ Fracture treatment evaluation
 - ✓ Water Block Problem – Reservoir Simulation Problem
 - ✓ Predicting production increase
- Fracturing Under Specific Circumstances; tight gas fracturing
 - ✓ High rate gas wells fracturing
 - ✓ Unconsolidated formation fracturing
 - ✓ Skin bypass treatment
 - ✓ Condensate dropout
 - ✓ Shale gas production with Plastic-like deformation

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