



Consulting and Training | Reach New Heights

Course Name

Hydraulic Fracturing

Sector Name

Oil, Gas and Chemical

Document Type

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Hydraulic Fracturing

Course Introduction

Hydraulic Fracturing and artificial lift are the two main activities of the Production engineer in the petroleum and related industries. The main purpose of stimulation is to enhance the property value by the faster delivery of the petroleum fluid and/or to increase ultimate economic recovery. Hydraulic fracturing is intended to remedy, or even improve, the natural connection of the wellbore with the reservoir, which could delay the need for artificial lift. Many wells that would otherwise be classified as dry holes have been made into profitable producers by fracture stimulation treatments. This training course discusses well stimulation, especially using hydraulic fracturing treatment, which is frequently used to stimulate old or poorly producing wells.

The stimulation techniques

It will cover the stimulation techniques as tools to help manage and optimize reservoir development. This comprehensive course is essential for petroleum industry professionals involved in the important activities of reservoir evaluation, development, and management, who require invaluable skills in the application of the techniques described for the successful exploitation of oil and gas reservoirs.

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Target Audience

- ✓ Process design
- ✓ Unit Operator
- ✓ Environmental
- ✓ Process safety engineer
- ✓ Gasoline blender engineer
- ✓ Lab supervisor
- ✓ Supply chain engineer
- ✓ Distillates analyst
- ✓ Models engineer
- ✓ Chemical Operator
- ✓ Chemical Plant Operator
- ✓ Chemical Process Technician
- ✓ Control Room Supervisor
- ✓ Gas Plant Process Operator
- ✓ Gas Production Operator
- ✓ Gas Terminal Operations and Storage
- ✓ Gathering Pipeline engineer
- ✓ Oil Terminal / Storage engineer
- ✓ Pipeline Maintenance / Equipment / Compliance / Repair
- ✓ Pipeline Testing / Technician / Supervisor / Safety
- ✓ Plant Equipment Operator

- ✓ Plant Operations Technician
- ✓ Plant Shutdown
- ✓ Plant Supervisor
- ✓ Power Distribution
- ✓ Power Plant Manager
- ✓ Process Supervisor
- ✓ Refinery Operations Technician / Manager
- ✓ Terminal Operator / Manager
- ✓ Utilities Operator

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Learning Objectives

- ✓ This interactive training course includes the following training methodologies as a percentage of the total tuition hours 30% Lectures
- ✓ 30% Workshops & Work Presentations
- ✓ 20% Case Studies & Practical Exercises
- ✓ 20% Videos, Software & General Discussions
- ✓ The course instructor may modify the above training methodology before or during the course for technical reasons, with no prior notice to participants

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Course Outline

✓ 01 Day One

Simple definition for the hydraulic fracturing Process.

- ✓ Stimulation definition.
- ✓ Why Reservoir Stimulation?
- ✓ What are the candidates' Reservoirs for Stimulation?
- ✓ Candidate Selection.
- ✓ Types of Stimulation Treatments.
- ✓ Basic Hydraulic Fracturing Principles.
- ✓ Harsh Environment for Hydraulic Fracturing.
- ✓ Rock Mechanics (quick review):
 - ✓ Young Modulus
 - ✓ Fracture toughness
 - ✓ Poisson's Ratio
 - ✓ In-situ stresses
 - ✓ Factors influencing the stress state
 - ✓ Stress measurement techniques

Fracture models:

Types of models:

- ✓ 2D Model: 1. PKN 2. KGD 3. Radial
- ✓ 3D Model: 1. Pseudo Three Dimensional (P3D) model 2. Planner Three Dimensional (PL3D)model 3. Fully Three-Dimensional model (3D)

- ✓ Hydraulic Fracturing Equipment:
- ✓ Blender (POD)
- ✓ Hydration Unit (GelPro or PCM), Mountain Mover (Sand Chief), & Cilo
- ✓ Manifold Trailer
- ✓ Pump
- ✓ Monitoring unit
- ✓ Lab

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Course Outline

✓ 02 Day Two

Hydraulic Fracturing Fluids:

- ✓ What is the goal of water analysis?
- ✓ What are Water Quality Limits for Fracturing Fluids?
- ✓ What are the Functions of the fracturing fluid system?
- ✓ What are the ideal fluid system properties?
- ✓ What types of fracturing fluid systems are available?
- ✓ What are the advantages & disadvantages of each fluid system?
- ✓ What are the Fracturing Fluid Additives?

Hydraulic fracturing Propping Agent:

- ✓ Definition.
- ✓ Ideal Proppant Characteristics.
- ✓ Proppant Physical Properties.
- ✓ Classes of propping agents.
- ✓ Proppant Testing.

Hydraulic Fracturing

Course Outline

✓ 03 Day Three

Complete Data Frac Analysis (mini Frac) with several real worked wells as examples:

- ✓ Step Rate Test.
- ✓ Flow Back Test.
- ✓ Step Down Test.
- ✓ Methods of calculations in case of availability of: Treating pressure. Calculated BHP.
- ✓ Calibration Injection Test.
- ✓ Analysis during pumping (Net Pressure Interpretation “Nolte-Smith plot”).
- ✓ Diagnostics for non-ideal fracture propagation.
- ✓ Formation pressure capacity and its complicating mechanisms. T – Shaped Fracture. Fissures opening. Height growth through the pinch point.
- ✓ Approaches to overcome Formation pressure capacity complicating mechanisms

Generalized Decline curve analysis: how to plot and interpret (Explain) the following approaches by yourself:

- ✓ G function approach.
- ✓ Square Root shut-in time approach.
- ✓ Square Root shut-in time plus pumping time approach.
- ✓ Log-log plot approach.
- ✓ Horner plot approach.

- ✓ Cartesian plot approach.

How to Calculate:

- ✓ Fluid Efficiency.
- ✓ Fracture dimensions.
- ✓ How to Calibrate stress data.
- ✓ Identification of non-ideal behaviors during shutdown.
- ✓ New method to determine Closure pressure from calibration pumping period.
- ✓ Comparing between different techniques simultaneously.

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✓ 04 Day Four

Hydraulic Fracturing Simulator:

FracCade:

- ✓ What are the general inputs for the FracCade simulator?
- ✓ How to use the simulator for: Data Frac analysis.
- ✓ Post-treatment. Main Frac Treatment design and evaluation.
- ✓ Redesign of the main Frac Treatment process. Post-treatment evaluation.
- ✓ Calculating BHP from Treating Pressure.

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Course Outline

✓ 05 Day Five

Quality Control:

- ✓ What Is Quality Control (QC)?
- ✓ Why Is Quality Control Important?
- ✓ Fracturing quality control checklist

Hydraulic Fracturing Operations:

- ✓ Hydraulic Fracturing Equipment R/U.
- ✓ Pre-job safety meeting.
- ✓ Pre-job Lab Test
- ✓ Water analysis
- ✓ Check gel quality
- ✓ Breaker test.
- ✓ Pressure Testing
- ✓ Mini Frac
- ✓ Analysis for mini Frac
- ✓ Main Frac treatment
- ✓ Main Fracturing Treatment Design
- ✓ Treatment optimization design procedures.
- ✓ Design process.
- ✓ Design considerations.
- ✓ Fracture design criteria.

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 14, 2027	June 18, 2027	5 days	4250.00 \$	UAE , Abu Dhabi
Sept. 28, 2026	Oct. 2, 2026	5 days	4950.00 \$	England , London
Jan. 4, 2027	Jan. 8, 2027	5 days	4250.00 \$	UAE , Dubai
March 15, 2027	March 19, 2027	5 days	4250.00 \$	UAE , Dubai

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