Training Course on Mastering Petrophysical Properties for Oil and Gas Reservoir Analysis

Professional Development Training Course Outline

Category	Oil and Gas	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The study of petrophysical properties is a cornerstone in the exploration and development of oil and gas reservoirs. Training Course on Mastering Petrophysical Properties for Oil & Gas Reservoir Analysis offers an in-depth look at critical rock and fluid properties such as porosity, permeability, water saturation, and capillary pressure, which directly impact reservoir productivity and hydrocarbon recovery. By understanding the science behind these core parameters, professionals can optimize well performance, reduce exploration risks, and increase overall field efficiency. This course is designed for geoscientists, petroleum engineers, petrophysicists, and technical professionals seeking advanced knowledge in subsurface reservoir characterization.

In today’s data-driven energy sector, mastering petrophysical analysis tools and techniques is essential for effective decision-making. This course incorporates the latest advances in well log interpretation, core analysis, formation evaluation, and reservoir modeling. Using real-world case studies and interactive simulations, learners will gain practical, applicable skills to analyze and interpret subsurface data accurately. Whether you're focused on conventional or unconventional reservoirs, this course empowers you to extract meaningful insights that drive successful energy exploration and production.

Programme Curriculum

Training Course on Mastering Petrophysical Properties for Oil & Gas Reservoir Analysis

Introduction

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Learning Objectives

1. Define and classify petrophysical properties for conventional and unconventional reservoirs.
2. Analyze porosity and permeability trends using well log data and core samples.
3. Interpret water saturation using Archie’s equation and modern log analysis techniques.
4. Understand the relationship between rock texture and fluid flow in hydrocarbon systems.
5. Evaluate formation resistivity and its role in fluid identification.
6. Conduct capillary pressure analysis to determine hydrocarbon column height.
7. Utilize nuclear, sonic, and density logs for lithology and porosity estimation.
8. Apply petrophysical models in reservoir simulation and performance forecasting.
9. Integrate geophysical and geological data for comprehensive reservoir characterization.
10. Identify clay volume and its impact on effective porosity and permeability.
11. Estimate hydrocarbon in place (OHIP) using volumetric methods.
12. Perform crossplot analysis and multi-log interpretation using software tools.
13. Assess petrophysical uncertainties and their influence on reservoir development decisions.

Target Audience

1. Petroleum Engineers
2. Geologists & Geophysicists
3. Reservoir Engineers
4. Petrophysicists
5. Energy Analysts
6. Oilfield Technicians
7. Subsurface Data Scientists
8. Geoscience Students & Researchers

Course Duration: 5 days

Course Modules

Module 1: Introduction to Petrophysics

- Definition and importance of petrophysical properties
- Historical evolution of petrophysical analysis
- Key physical rock and fluid properties
- Classification of conventional vs. unconventional reservoirs
- Overview of petrophysical workflow in field development

Module 2: Porosity Analysis

- Types of porosity: effective vs. total
- Measurement techniques (core vs. log derived)
- Influence of mineralogy and texture
- Porosity from neutron, density, and sonic logs
- Case studies on porosity variation in reservoirs

Module 3: Permeability Estimation

- Darcy's Law and fluid flow mechanisms
- Measurement techniques: core lab and log-based
- Permeability-porosity relationship
- Permeability in tight gas and shale plays
- Well productivity and permeability analysis

Module 4: Water Saturation & Archie's Equation

- Concepts of Sw, resistivity index, and saturation exponent
- Application of Archie's Law in clean sandstones
- Modified equations for shaly sands
- Impact of Sw on reserves estimation
- Log-based Sw analysis: SP, resistivity, and dielectric logs

Module 5: Capillary Pressure and Wettability

- Fundamentals of capillary pressure curves
- Laboratory measurements and Mercury Injection
- Reservoir wettability and its impact
- Leverett J-function application
- Estimating height of hydrocarbon column

Module 6: Advanced Logging Techniques

- Spectral gamma-ray and mineral identification
- Nuclear magnetic resonance (NMR) applications
- Sonic and shear wave logs for rock strength
- Image logs for structural interpretation
- Data quality control and tool calibration

Module 7: Integrated Petrophysical Modeling

- Combining core, log, and seismic data
- Use of petrophysical software (e.g., Techlog, Petra)
- Building and validating petrophysical models
- Generating rock typing and reservoir maps
- Predicting reservoir performance and recovery factor

Module 8: Reservoir Evaluation and Case Studies

- Reserves estimation from petrophysical inputs
- Volumetric calculations of OHIP
- Risk and uncertainty quantification
- Application in field development planning
- Real-world case studies in onshore/offshore fields

Training Methodology

- live online instruction
- hands-on exercises
- data interpretation workshops
- real case studies
- software-based simulations for practical learning.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com