Training Course on Fractured and Unconventional Reservoir Modelling

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

In today’s rapidly evolving energy landscape, unconventional resources such as shale gas, tight oil, and coalbed methane have become crucial to global energy supply. Training Course on Fractured & Unconventional Reservoir Modelling is designed to empower professionals with the latest tools, data-driven methodologies, and digital techniques needed for accurately modeling and optimizing production from complex reservoirs. Using advanced geomechanical modeling, fracture characterization, and AI-assisted reservoir simulation, this course bridges theory and practical application with industry-relevant case studies.

As hydrocarbon exploration moves toward increasingly complex formations, understanding reservoir heterogeneity, fluid flow dynamics, and fracture networks is more critical than ever. This course provides geoscientists, reservoir engineers, and energy data professionals with a robust foundation to model multi-scale fractures, assess well performance, and drive data-centric decision-making through machine learning, big data integration, and advanced simulation workflows.

Programme Curriculum

Training Course on Fractured & Unconventional Reservoir Modelling

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Course Objectives

1. Understand the fundamentals of unconventional reservoir characterization and fracture analysis
2. Apply geomechanical modeling techniques for hydraulic fracture simulation
3. Integrate machine learning algorithms for reservoir performance prediction
4. Explore rock mechanics and stress-strain behavior in fractured formations
5. Use data analytics tools to enhance unconventional reservoir evaluation
6. Perform 3D static and dynamic modeling of shale and tight reservoirs
7. Understand the impact of natural and induced fractures on fluid flow
8. Utilize AI-based history matching and production forecasting techniques
9. Analyze field-scale data for reservoir simulation and optimization
10. Design effective stimulation and completion strategies using modeling outputs
11. Integrate multi-scale data from core samples, logs, and seismic
12. Learn about energy transition impacts on unconventional resource development
13. Apply real-world case studies to benchmark modeling accuracy and decision-making

Target Audience

1. Reservoir Engineers
2. Petroleum Geologists
3. Geophysicists
4. Data Scientists in Oil & Gas
5. Drilling Engineers
6. Field Development Planners
7. Completion & Production Engineers
8. Energy Transition Consultants

Course Duration: 5 days

Course Modules

Module 1: Fundamentals of Unconventional Reservoirs

- Overview of unconventional resources
- Key differences between conventional and unconventional reservoirs
- Shale, tight gas, and coalbed methane characteristics
- Challenges in modeling fractured reservoirs
- Introduction to reservoir heterogeneity and porosity types
- **Case Study**: Modeling Barnett Shale productivity

Module 2: Rock Mechanics & Geomechanics

- Stress-strain behavior in rock formations
- Mechanical properties of shale and tight formations
- Role of geomechanics in fracture propagation
- In-situ stress estimation and its impact
- Geomechanical input for simulation models
- **Case Study**: Geomechanical modeling in the Bakken Formation

Module 3: Fracture Characterization & Modeling

- Natural vs. induced fractures
- Fracture network properties and conductivity
- Diagnostic Fracture Injection Tests (DFIT)
- Discrete Fracture Network (DFN) modeling
- Tools and software for fracture analysis
- **Case Study**: Eagle Ford fracture network mapping

Module 4: Reservoir Simulation of Unconventional Plays

- Principles of single and multi-phase flow in fractured media
- Dual-porosity and dual-permeability models
- Grid generation and upscaling techniques
- Simulation of production decline
- Matching simulation results with field data
- **Case Study**: Marcellus shale reservoir simulation

Module 5: Integration of Multi-Scale Data

- Use of core, well log, seismic, and production data
- Challenges in data harmonization
- Multi-disciplinary data interpretation workflows
- Big data integration for enhanced modeling
- Importance of data resolution and scale
- **Case Study**: Multi-scale integration in the Permian Basin

Module 6: Machine Learning in Reservoir Modelling

- Role of AI and ML in unconventional reservoir management
- Feature selection and predictive modeling
- Use of supervised learning in production forecasting
- Neural networks for pattern recognition in logs
- ML-assisted history matching
- **Case Study**: AI-based forecasting in Haynesville shale

Module 7: Production Optimization & Field Development

- Techniques for optimizing well spacing and fracturing stages
- Evaluation of completion strategies
- Dynamic modeling for recovery improvement
- Forecasting production under varying scenarios
- Integrating economic models with reservoir simulation
- **Case Study**: Field optimization in the Utica shale

Module 8: Future Trends & Sustainability in Unconventional Reservoirs

- Digital oilfield technologies and automation
- Sustainability considerations in unconventional development
- CO? injection and EOR in tight reservoirs
- ESG factors and regulatory impacts
- Innovations in drilling and completion technologies
- **Case Study**: Sustainable reservoir modeling in Vaca Muerta

Training Methodology

- Instructor-led live sessions with real-time Q&A
- Interactive group workshops and technical exercises

- Hands-on training using commercial simulation software
- Case study discussions for practical relevance
- Assessments and quizzes to track participant 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

Start Date	End Date	Location	Price
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