Training Course on Drilling Fluids and Cementing Technology (Advanced)

Professional Development Training Course Outline

Category	Oil and Gas	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Training Course on Drilling Fluids & Cementing Technology (Advanced) is designed for experienced engineers, geologists, and drilling professionals aiming to deepen their expertise in fluid mechanics and advanced cementing strategies. With oil and gas exploration advancing into more complex environments, this course addresses high-performance drilling fluids, loss circulation materials, deepwater cementing, and real-time rheology analysis. Participants will explore the integration of cutting-edge technologies with proven practices to optimize wellbore integrity, formation protection, and production efficiency.

With the increasing demand for cost-effective drilling solutions, non-damaging fluids, and sustainable cementing practices, this advanced training provides in-depth exposure to fluid rheology, HPHT (High-Pressure High-Temperature) well conditions, geomechanics, and plug & abandonment technologies. Case studies, live simulations, and hands-on analysis tools will equip professionals with practical know-how to make critical decisions on-site.

Programme Curriculum

Training Course on Drilling Fluids & Cementing Technology (Advanced)

Introduction

Training Course on Drilling Fluids & Cementing Technology (Advanced) is designed for experienced engineers, geologists, and drilling professionals aiming to deepen their expertise in fluid mechanics and advanced cementing strategies. With oil and gas exploration advancing into more complex environments, this course addresses high-performance drilling fluids, loss circulation materials, deepwater cementing, and real-time rheology analysis. Participants will explore the integration of cutting-edge technologies with proven practices to optimize wellbore integrity, formation protection, and production efficiency.

With the increasing demand for cost-effective drilling solutions, non-damaging fluids, and sustainable cementing practices, this advanced training provides in-depth exposure to fluid rheology, HPHT (High-Pressure High-Temperature) well conditions, geomechanics, and plug & abandonment technologies. Case studies, live simulations, and hands-on analysis tools will equip professionals with practical know-how to make critical decisions on-site.

Course Objectives

1. Understand advanced rheology control in synthetic and water-based drilling fluids.
2. Evaluate the role of nano-additives in improving drilling fluid performance.
3. Design and analyze HPHT drilling fluid systems for extreme environments.
4. Optimize cement slurry properties for zonal isolation and long-term well integrity.
5. Investigate loss circulation prevention techniques using bridging agents.
6. Understand deepwater cementing challenges and engineered solutions.
7. Apply real-time data analytics for drilling fluid and cementing operations.
8. Use machine learning and AI for predictive fluid behavior analysis.
9. Minimize formation damage with advanced non-invasive fluid technologies.
10. Apply plug and abandonment best practices in mature wells.
11. Select appropriate fluid additives for shale stability and corrosion control.
12. Comply with HSE and environmental sustainability standards.
13. Analyze cement bond logs for integrity verification and remediation planning.

Target Audiences

1. Drilling Engineers
2. Cementing Specialists
3. Mud Engineers (Fluids Engineers)
4. Geomechanics Experts
5. Reservoir Engineers
6. Well Integrity Managers
7. Petroleum Engineering Students
8. HSE & Compliance Officers

Course Duration: 15 days

Course Modules

Module 1: Fundamentals of Advanced Drilling Fluids

- Classification and properties of drilling fluids
- Water-based vs. synthetic-based fluids
- Role of pH, viscosity, and gel strength
- Temperature and pressure impacts on fluid performance
- Testing and monitoring of drilling fluid parameters
- **Case Study:** Optimizing fluid design for shale play in the Permian Basin

Module 2: Rheology and Flow Behavior in HPHT Conditions

- Fluid flow profiles in HPHT wells
- Advanced rheological models (Herschel-Bulkley, Bingham Plastic)
- Viscometer calibration and measurements
- Gelation and fluid carrying capacity
- Temperature-viscosity dependency
- **Case Study:** Rheological failure leading to stuck pipe in North Sea operation

Module 3: Fluid Loss Control and Bridging Agents

- Mechanisms of fluid loss (filtration vs. invasion)
- Additive selection for LCM (loss circulation materials)
- Importance of particle size distribution
- Formation compatibility assessment
- Bridging agents for fractured formations
- **Case Study:** Successful loss circulation mitigation in a deep fractured carbonate well

Module 4: Formation Damage and Non-Invasive Fluids

- Types and causes of formation damage
- Drill-in fluids and non-damaging additives
- Return permeability testing
- Solids control and clean-up techniques
- Brine selection and compatibility
- **Case Study:** Non-invasive fluid usage in unconsolidated sandstones

Module 5: Deepwater Drilling Fluids Management

- Low-temperature performance characteristics
- Riser margin and dual-gradient systems
- Hydrate prevention strategies
- Pressure-Temperature simulation tools
- Advanced filtrate control technologies
- **Case Study:** Managing synthetic mud in Gulf of Mexico deepwater operations

Module 6: Advanced Cementing Principles

- Slurry design and density optimization
- Yield point and free water calculations
- Cement additives and retarders
- Placement techniques and displacement efficiency
- Set time and thickening time measurement
- **Case Study:** Cementing challenges in extended-reach horizontal wells

Module 7: Zonal Isolation and Cement Integrity

- Barriers to fluid migration
- Casing centralization and hole cleaning
- Annular pressure management
- Expanding cements and self-healing cement
- Evaluation using cement bond logs (CBL)
- **Case Study:** Remedial cementing in a leaking annulus offshore platform

Module 8: Real-Time Monitoring and Analytics

- Real-time mud logging technologies
- Sensor calibration and data integration
- KPI dashboards and alerts
- Early kick detection via fluid anomalies
- Predictive analytics in cement slurry design
- **Case Study:** Real-time loss detection in a remote drilling site

Module 9: Drilling Fluid Waste Management

- Solids control systems
- Waste minimization strategies

- Cuttings reinjection
- Drilling waste disposal standards
- HSE risk assessment
- **Case Study:** Compliance and cost-savings in a zero-discharge onshore well

Module 10: Plug and Abandonment Fluids and Techniques

- Temporary vs. permanent abandonment
- Cement plugs and mechanical barriers
- Fluid compatibility with aged casings
- Abandonment planning workflow
- Verification and regulatory approval
- **Case Study:** P&A operation in decommissioned North Sea field

Module 11: Additives for Shale Stability

- Hydration inhibitors and encapsulating polymers
- Potassium-based vs. polymer-based systems
- Shale inhibitor testing protocols
- Inhibition mechanisms and selection
- Mechanical integrity of shale formations
- **Case Study:** KCl-Polymer solution success in the Marcellus shale

Module 12: Nano-Technology in Drilling Fluids and Cement

- Role of nano-silica in cement enhancement
- Nanoparticles for improved fluid carrying capacity
- Thermal resistance improvement
- Compatibility with conventional additives
- Cost-benefit analysis
- **Case Study:** Nanofluid deployment in ultra-deepwater cementing

Module 13: Advanced Cementing Equipment & Placement Tools

- Auto-mixers and batch mixers
- Spacer and wiper plug systems
- Centralizers and scratchers
- Cement heads and displacement control
- Cementing simulation software
- **Case Study:** Cement placement tool optimization in deviated wells

Module 14: Cement Job Evaluation and Logging

- CBL, VDL, and ultrasonic log interpretation
- Job design vs. field implementation
- Pressure testing and leak-off tests
- Cement top verification techniques
- Decision-making in remediation
- **Case Study:** Logging analysis for failed isolation in gas-producing well

Module 15: HSE Compliance & Environmental Considerations

- Fluid biodegradability and toxicity
- Spill prevention strategies
- Regulatory frameworks (API, ISO, local laws)
- Chemical storage and handling

- Worker safety procedures in fluid mixing
- **Case Study:** Regulatory violation and corrective actions in South American onshore site

Training Methodology

- Instructor-led sessions with multimedia presentations
- Real-life case study analyses and group discussions
- Hands-on simulations using drilling and cementing software
- Problem-solving workshops and scenario planning
- Technical assessments and post-course evaluations

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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

Register Online Now

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