MERCURY

Reservoir Engineering Workshop Simulation, Optimization

28 March – 1 April 2027
Sharm El-Sheikh (Egypt)



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Reservoir Engineering Workshop Simulation, Optimization

Ref: 16197_1077963 **Date:** 28 March – 1 April 2027 **Location:** Sharm El-Sheikh (Egypt) **Fees:** 4500 Euro

Introduction:

This Reservoir Engineering workshop delivers a high-level, technically rigorous immersion into the core and practices of reservoir engineering. With a strong focus on simulation, modeling, AI integration, and data-driven decision-making, participants will engage with real-world case studies and workflows to enhance reservoir performance and maximize hydrocarbon recovery in both conventional and unconventional oil and gas systems.

Target Audience:

This Reservoir Engineering training targets professionals seeking specialized knowledge and skills:

- Reservoir Engineers.
- Petroleum Engineers are involved in modeling and forecasting.
- Subsurface Team Leaders and Technical Managers.
- Field Development Planners.
- E&P Analysts focused on production optimization.
- Data Scientists working in upstream oil and gas analytics.

Training Objectives:

By the end of this Reservoir Engineering workshop, participants will be able to:

- Build integrated reservoir models from static to dynamic stages.
- Apply history-matching techniques effectively to enhance model accuracy.
- Execute simulation techniques for complex reservoir types.
- Utilize AI and analytics to support reservoir management.
- Assess the economic outcomes of reservoir development strategies under uncertainty.
- Integrate field data for real-time decision-making.

Targeted Competencies:

Participants will gain the following competencies during the Reservoir Engineering program:

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- Reservoir simulation.
- Uncertainty management in modeling.
- Integrated field development planning.
- Application of AI in subsurface workflows.
- Performance diagnostics and optimization.
- Technical-economic evaluation under risk.

Workshop Content:

Unit 1: Reservoir Engineering and Characterization Essentials:

- Fundamentals of reservoir engineering: drive mechanisms, volumetrics, forecasting.
- Geological and petrophysical characterization.
- Integration of well logs, core data, and seismic for property modeling.
- Reservoir heterogeneity and scale-up methods.
- Static to dynamic model preparation.

Unit 2: Reservoir Modeling and Numerical Simulation Principles:

- 3D grid construction and property population.
- Initialization and fluid flow modeling black oil/compositional.
- Finite difference and finite volume numerical methods.
- Handling operational constraints and multi-phase flow.
- Simulation stability, validation, and troubleshooting.

Unit 3: Modeling for Unconventional and Carbonate Reservoirs:

- Specifics of unconventional reservoirs: shale gas, tight oil, fractured systems.
- Dual porosity/dual permeability models.
- Fracture modeling and SRV estimation.
- Simulation of carbonate reservoirs with complex structures.
- Numerical techniques and hybrid methods.

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Unit 4: Integrated Reservoir Management and Optimization:

- Smart reservoir management with AI/ML tools.
- Predictive modeling and real-time data utilization.
- Integrated workflows between geoscience, drilling, and production.
- Closed-loop reservoir management.
- Field-level production optimization strategies.

Unit 5: History Matching, Uncertainty Management, and Evolutionary Optimization:

- Manual and assisted history matching.
- Multi-objective optimization: GA, PSO, and hybrid methods.
- Uncertainty quantification Monte Carlo, Latin Hypercube.
- Proxy models and scenario-based forecasting.
- Bridging the gap between modeled performance and field data.

Unit 6: Economics, Case Studies, and Real-World Applications:

- Economic Evaluation of Development Plans under Uncertainty.
- Real options and scenario economics.
- Case studies: conventional, unconventional, EOR fields.
- Lessons learned from high-stakes simulation projects.
- Field data integration for decisions with financial impact.