Advanced Integrated Petrophysics and Formation Evaluation Course

28 February – 4 March 2027
Johannesburg

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Training Center

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Ref: 1169_186361 **Date:** 28 February – 4 March 2027 **Location:** Johannesburg **Fees:** 6000 Euro

Overview

Advanced Integrated Petrophysics and Formation Evaluation Course is a one-week course for petrophysicists, reservoir engineers, geoscientists, drilling and completion engineers, subsurface analysts, and technical managers who need a Formation Evaluation Interpretation Pack. Participants build an integrated petrophysics workflow, a well log interpretation workflow, and a core-log calibration workflow to support reservoir quality decisions while testing data quality and uncertainty. Agile Leaders Training Center develops formation evaluation practice.

Who Should Attend

- Subsurface teams responsible for interpreting logs, core measurements, and reservoir properties
- Reservoir teams responsible for rock quality, fluid distribution, volumetrics, and development inputs
- Geoscience teams responsible for lithology, stratigraphic context, and formation correlation
- Drilling and completion teams responsible for acquisition choices, intervals, and technical handoffs
- Technical assurance teams responsible for interpretation quality, uncertainty, and decision traceability

The course assumes participants can read common well-log tracks and reservoir-property tables; it leaves out introductory geology, tool engineering, and proprietary software operation.

Departments and Industries

The course supports organizations that evaluate subsurface formations for resource, storage, geothermal, and groundwater decisions.

- Petrophysics, reservoir engineering, geology, and geophysics departments
- Drilling, formation testing, completion, and production teams
- Energy operators, technical service companies, and subsurface consultancies
- Carbon storage and geothermal development organizations
- Groundwater, geotechnical, research, and technical assurance groups

Learning Objectives

By the end of this course, participants will be able to:

- Apply log quality-control and environmental-correction workflows
- Analyze lithology, shale volume, porosity, resistivity, and fluid effects
- Compare saturation models and document their applicability limits
- Build core-log calibration, permeability, and rock-type relationships
- Evaluate net-reservoir and net-pay cutoffs with uncertainty ranges
- Integrate multidisciplinary evidence into a traceable interpretation pack

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Course Agenda

Day 1: Data Conditioning and Interpretation Design

- Formation Evaluation Objective and Decision Map
- Log Inventory, Depth-Match, and Data-Lineage Sheet
- Borehole Environment and Log Quality-Control Checklist
- Environmental Correction and Bad-Hole Flag Workflow
- Deterministic and Probabilistic Interpretation Design

Day 2: Lithology and Porosity Interpretation

- Gamma-Ray and Spontaneous-Potential Lithology Panel
- Density-Neutron-Sonic Porosity Crossplot Method
- Mineral Volume and Shale Fraction Model
- Clean, Shaly-Sand, and Carbonate Response Diagnostic
- Effective Porosity and Fluid-Correction Worksheet

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Day 3: Resistivity and Saturation Models

- Resistivity Profile and Invasion-Zone Diagnostic
- Formation-Water Resistivity and Pickett Plot Method
- Archie Saturation Model and Applicability Test
- Simandoux, Indonesian, and Dual Water Model Comparison
- Water-Saturation Sensitivity and Parameter Register

Day 4: Core Integration and Reservoir Quality

- Routine Core Analysis Quality and Condition Review
- Core-to-Log Depth Alignment and Calibration Matrix
- Porosity-Permeability Transform and Rock-Typing Method
- Net-Reservoir and Net-Pay Cutoff Decision Table
- Reservoir-Quality Ranking and Uncertainty Dashboard

Day 5: Integrated Interpretation Practice

- Exercise: Diagnose Log Quality and Apply Correction Flags
- Exercise: Build a Lithology and Porosity Interpretation
- Exercise: Compare Saturation Models and Sensitivities
- Exercise: Calibrate Permeability and Select Pay Cutoffs
- Capstone Exercise: Formation Evaluation Interpretation Pack

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Practical Exercises

The course uses suggested activities that connect measurements, assumptions, model choices, uncertainty, and technical decisions.

- Suggested activity: identify unreliable intervals from borehole and log-quality evidence
- Suggested activity: reconcile density-neutron porosity with lithology and core measurements
- Suggested activity: test how water resistivity and model choice change saturation estimates
- Suggested activity: defend reservoir-quality classes and pay cutoffs using an uncertainty register

FAQs

Who suits advanced integrated petrophysics and formation evaluation training?

Petrophysics, reservoir, geoscience, drilling, completion, and assurance professionals suit the training. Participants should already read common log tracks and reservoir-property tables.

How does integrated petrophysics differ from introductory well logging?

Integrated petrophysics combines conditioned logs, core data, geological context, saturation models, permeability relationships, cutoffs, and uncertainty, while introductory well logging primarily explains measurements and basic responses.

Why does formation evaluation compare several saturation models?

Several models are compared because clean formations, shaly sands, pore structures, water properties, and parameter assumptions affect resistivity responses differently; applicability and sensitivity must be documented.

How does core-log calibration improve reservoir-quality interpretation?

Core-log calibration aligns depths, tests measurement conditions, reconciles porosity and permeability relationships, and identifies scale or sampling differences before core evidence is used to constrain continuous log interpretation.

How should net-pay cutoffs be used in formation evaluation?

Net-pay cutoffs should be tied to the decision, data quality, rock and fluid behavior, completion context, and sensitivity ranges rather than applied as unexplained fixed values.

Conclusion

Participants take back a Formation Evaluation Interpretation Pack containing quality flags, lithology and porosity models, saturation comparisons, core calibrations, permeability transforms, cutoff tables, reservoir-quality rankings, and uncertainty registers. The pack makes assumptions and evidence traceable across subsurface teams. It supports consistent technical review without presenting one model as universally applicable.