Fundamentals of Well Logging and Log Analysis Training Course

OGT-1088 · 5 days · 15 CPD hours · English

OVERVIEW

The **Fundamentals of Well Logging and Log Analysis Training Course** offered by the Oil & Gas Training Institute is designed to develop participants' technical understanding of well logging principles, logging tools, formation evaluation techniques and the interpretation of subsurface data. Well logging is an essential process in oil and gas exploration and production, providing valuable information about geological formations, reservoir properties, fluid distribution and potential hydrocarbon-bearing zones.

Accurate well logging and log analysis play a significant role in evaluating reservoir quality, identifying productive formations and supporting informed drilling and completion decisions. By examining measurements recorded along a wellbore, petroleum professionals can gain insights into formation characteristics that cannot be determined through drilling observations alone. Understanding these measurements is particularly important for reducing subsurface uncertainties, improving reservoir characterisation and supporting efficient field development.

This professional training programme introduces participants to the fundamental concepts of wireline logging, logging operations and the different types of measurements used in formation evaluation. It explores commonly applied logging tools and explains how their measurements contribute to identifying lithology, estimating porosity, evaluating fluid saturation and understanding formation characteristics.

Participants will develop practical knowledge of important logging techniques, including gamma ray log interpretation, neutron density log analysis, sonic log evaluation and resistivity measurements. The programme also examines the relationship between different logging measurements and how they can be integrated to produce a more reliable understanding of subsurface formations.

As part of the **Well Log Analysis for Oil & Gas** category, the course emphasises the practical application of logging data in petroleum exploration, drilling operations and reservoir evaluation. Participants will learn how to recognise common log patterns, distinguish between different lithological formations, assess basic reservoir properties and identify potential hydrocarbon-bearing intervals.

The course also introduces the importance of data quality, logging tool calibration, environmental corrections and interpretation limitations. These concepts help professionals understand why logging measurements must be evaluated carefully before being used in technical assessments and operational decisions.

Through instructor-led sessions, practical exercises, interpretation workshops and industry-related case studies, participants will strengthen their ability to work with well logging data and understand its contribution to subsurface evaluation.

The Oil & Gas Training Institute aims to provide a structured learning experience that connects fundamental technical knowledge with practical industry applications, helping participants build a stronger foundation in well logging and

formation evaluation.

OBJECTIVES

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

1. **Explain** the fundamental principles of well logging and describe its importance in oil and gas exploration, drilling and reservoir evaluation.

2. **Identify** different types of logging tools, their operating principles, measurement capabilities and applications in subsurface formation assessment.

3. **Interpret** basic gamma ray log responses to distinguish between shale-rich and cleaner formations and support lithology identification.

4. **Analyse** neutron density log measurements to estimate formation porosity and understand their relationship with lithological characteristics.

5. **Evaluate** sonic log responses and explain their application in porosity estimation, formation characterisation and geomechanical assessment.

6. **Understand** resistivity log measurements and their importance in identifying potential hydrocarbon-bearing formations and evaluating fluid distribution.

7. **Apply** basic log analysis techniques to recognise formation boundaries, identify potential reservoir intervals and assess subsurface characteristics.

8. **Examine** the effects of borehole conditions, mud properties, invasion and environmental factors on logging measurements.

9. **Integrate** different logging measurements to develop a more comprehensive understanding of lithology, porosity and formation fluid characteristics.

10. **Interpret** basic well log datasets and communicate findings to support geological, petrophysical and drilling-related decisions.

TRAINING METHODOLOGY

The Fundamentals of Well Logging and Log Analysis Training Course adopts a practical, technically focused and interactive training methodology. The programme combines theoretical instruction with interpretation exercises and industry-related applications to help participants understand how well logging measurements are acquired, processed and evaluated.

The training approach focuses on developing the technical knowledge required to recognise logging responses, understand measurement limitations and apply basic interpretation techniques to real-world subsurface evaluation challenges.

Interactive Presentations and Technical Discussions

Instructor-led presentations introduce the fundamental principles of well logging, formation evaluation and logging operations. Participants explore the functions of different logging tools, measurement techniques and the geological information obtained from various log responses.

Technical discussions help clarify complex concepts, including formation resistivity, porosity measurements, radioactive logging responses and acoustic properties.

Logging Tool Demonstrations

Participants examine the working principles and applications of commonly used logging equipment, including:

- Gamma ray logging tools.
- Resistivity logging tools.
- Neutron porosity tools.
- Density logging tools.
- Sonic logging tools.
- Caliper and borehole measurement tools.

These demonstrations help participants understand how different tools acquire formation measurements and why tool selection depends on logging objectives and well conditions.

Practical Log Interpretation Workshops

Hands-on exercises allow participants to work with representative well log datasets and practise interpreting different logging responses.

Activities include:

- Recognising gamma ray log patterns.
- Comparing neutron and density log responses.
- Understanding sonic travel-time measurements.
- Identifying possible formation boundaries.
- Examining resistivity variations.
- Estimating basic formation properties using suitable interpretation methods.

Industry-Based Case Studies

Realistic oil and gas scenarios are used to demonstrate how logging data supports exploration and production activities. Participants review representative logging examples to understand how multiple measurements can be combined to evaluate reservoir characteristics and identify potential hydrocarbon-bearing intervals.

Group Activities and Collaborative Learning

Participants work in groups to examine selected logging datasets, compare interpretation approaches and discuss the limitations of individual logging measurements.

These activities encourage technical communication and demonstrate the importance of integrating geological, drilling and petrophysical information.

Scenario-Based Problem-Solving

Practical scenarios introduce common logging challenges, including borehole enlargement, mud invasion, inconsistent log responses and uncertain lithology.

Participants explore how these conditions influence measurement quality and learn to consider possible sources of error before drawing interpretation conclusions.

Knowledge Sharing and Technical Feedback

Throughout the programme, participants share professional experiences, discuss industry practices and receive instructor feedback on their interpretation exercises. This approach helps connect theoretical understanding with practical workplace responsibilities.

ORGANISATIONAL IMPACT

Developing well logging and log analysis capabilities can contribute significantly to the technical effectiveness and operational performance of oil and gas organisations. Accurate interpretation of subsurface measurements supports better understanding of reservoir formations, improves geological assessments and helps organisations make more informed decisions throughout the well lifecycle.

The course supports organisational development through the following areas:

Improved Formation Evaluation

A stronger understanding of well logging techniques enables technical teams to evaluate formation characteristics more effectively. Employees can recognise important logging responses, distinguish between different lithologies and develop a clearer understanding of potential reservoir intervals.

This contributes to more consistent formation evaluation and better integration of subsurface information.

Better Drilling and Exploration Decisions

Well logging provides important information about formations encountered during drilling. Professionals who understand logging measurements can contribute more effectively to discussions about formation boundaries,

reservoir potential and subsurface uncertainties.

This knowledge supports technical decision-making during exploration and drilling activities.

Enhanced Reservoir Characterisation

Integrating gamma ray, resistivity, neutron density and sonic log measurements helps technical teams develop a more comprehensive understanding of reservoir properties.

Improved interpretation capabilities can support:

- Identification of potential reservoir zones.
- Evaluation of formation porosity.
- Preliminary assessment of fluid distribution.
- Recognition of lithological variations.
- Improved understanding of subsurface heterogeneity.

Reduced Interpretation Errors

Understanding logging tool limitations, borehole effects and environmental corrections helps organisations improve the reliability of formation evaluation activities.

Employees become better equipped to recognise unusual measurements, investigate inconsistent responses and avoid unsupported conclusions.

Improved Technical Collaboration

Well log interpretation frequently requires collaboration between geologists, petrophysicists, drilling engineers and reservoir engineers.

The course strengthens shared technical understanding, enabling multidisciplinary teams to communicate logging findings more effectively and coordinate their evaluations.

Increased Operational Efficiency

Developing internal technical capabilities can improve the efficiency of logging data reviews and preliminary interpretation activities.

Employees with stronger foundational knowledge can identify relevant measurements, organise technical information and contribute more effectively to evaluation workflows.

Stronger Reservoir Management

Reliable logging interpretation supports reservoir understanding throughout exploration, appraisal and production.

Improved knowledge of formation characteristics can contribute to better reservoir monitoring strategies and more informed field development decisions.

Development of Technical Workforce Capabilities

Providing structured training in well logging helps organisations strengthen the capabilities of employees involved in subsurface evaluation and petroleum operations.

This supports knowledge development, technical consistency and the long-term development of specialised oil and gas teams.

PERSONAL IMPACT

The Fundamentals of Well Logging and Log Analysis Training Course provides participants with an opportunity to strengthen their technical knowledge and develop practical skills relevant to oil and gas exploration and production.

By completing this programme, participants can benefit in several professional areas.

Stronger Technical Understanding

Participants develop a structured understanding of well logging principles, measurement techniques and the role of logging data in evaluating subsurface formations.

This knowledge provides a foundation for understanding more advanced petrophysical and reservoir evaluation concepts.

Improved Log Interpretation Skills

Participants become more familiar with different logging curves and their applications.

They develop the ability to recognise common gamma ray, neutron density, sonic and resistivity log patterns and understand what these measurements reveal about formation characteristics.

Greater Confidence in Technical Discussions

Understanding logging terminology and measurement principles enables participants to communicate more confidently with geologists, petrophysicists, drilling engineers and other technical specialists.

They can contribute more effectively to discussions involving formation evaluation and logging results.

Enhanced Analytical and Problem-Solving Abilities

The course develops participants' ability to examine logging responses, identify unusual patterns and consider possible explanations for measurement variations.

This encourages a more systematic approach to technical interpretation.

Better Understanding of Reservoir Properties

Participants gain foundational knowledge of lithology identification, porosity evaluation and formation fluid characteristics.

This helps them understand how different measurements contribute to reservoir assessment.

Practical Workplace Application

Through interpretation workshops and case studies, participants learn how to apply theoretical concepts to representative logging datasets.

They become better prepared to support technical reviews and preliminary formation evaluation activities.

Increased Professional Versatility

Well logging knowledge is relevant to several petroleum industry disciplines. Developing this expertise can help participants understand multidisciplinary workflows and broaden their technical capabilities.

Career Development Opportunities

A strong foundation in well logging can support further professional development in:

- Petrophysical analysis.
- Formation evaluation.
- Petroleum geology.
- Drilling engineering.
- Reservoir characterisation.
- Wireline logging operations.
- Oil and gas exploration.

WHO SHOULD ATTEND

This course is suitable for professionals, graduates and technical personnel who want to develop or strengthen their understanding of well logging principles and formation evaluation.

The programme is particularly beneficial for the following groups:

Petroleum Engineers

Petroleum engineers can improve their understanding of logging measurements and learn how formation evaluation data contributes to reservoir assessment, well planning and production-related decisions.

Geologists and Petroleum Geologists

Geologists can strengthen their ability to recognise lithological variations, evaluate formation boundaries and understand how logging measurements complement geological interpretations.

Petrophysicists and Junior Formation Evaluation Specialists

Professionals beginning their careers in petrophysics can develop a stronger foundation in logging tool responses, porosity measurements, lithology identification and basic log interpretation.

Drilling Engineers

Drilling engineers can understand how logging information contributes to formation evaluation and supports technical decisions during and after drilling operations.

Wireline Logging Engineers and Technicians

Logging personnel can strengthen their knowledge of measurement principles, logging tool applications, data acquisition and the interpretation of basic logging responses.

Reservoir Engineers

Reservoir engineers can develop a better understanding of how well log data contributes to reservoir characterisation, porosity evaluation and preliminary fluid assessment.

Mud Logging and Wellsite Geologists

These professionals can improve their understanding of the relationship between drilling observations, formation characteristics and wireline logging measurements.

Oil and Gas Technical Supervisors

Supervisors and technical team leaders can gain foundational knowledge to better understand logging reports, review technical findings and coordinate subsurface evaluation activities.

Graduate Engineers and Geoscience Professionals

Recent graduates in petroleum engineering, geology, geophysics and related disciplines can use this programme to develop essential industry knowledge and prepare for technical responsibilities.

Oil and Gas Consultants

Consultants involved in petroleum exploration, formation evaluation and technical advisory services can strengthen their understanding of logging methods and their practical applications.

COURSE OUTLINE

Introduction to Well Logging Principles and Logging Operations

Gamma Ray, Resistivity Logging and Lithology Identification

Neutron Density Logging and Porosity Evaluation

Sonic Logging and Integrated Formation Evaluation

Practical Log Analysis, Case Studies and Technical Reporting

SCHEDULED DATES

Dates	Venue	Format	Fee
18 - 22 Jan 2027	Abu Dhabi, United Arab Emirates	In person	$11,500
18 - 22 Jan 2027	Abuja, Nigeria	In person	$11,500
18 - 22 Jan 2027	Accra, Ghana	In person	$11,500
18 - 22 Jan 2027	Addis Ababa, Ethiopia	In person	$11,500
18 - 22 Jan 2027	Al Ain, United Arab Emirates	In person	$11,500
18 - 22 Jan 2027	Al Khobar, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Alberta, Canada	In person	$11,500
18 - 22 Jan 2027	AlUla, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Amman, Jordan	In person	$11,500
18 - 22 Jan 2027	Amsterdam, The Netherlands	In person	$11,500
18 - 22 Jan 2027	Athens, Greece	In person	$11,500
18 - 22 Jan 2027	Baku, Azerbaijan	In person	$11,500
18 - 22 Jan 2027	Barcelona, Spain	In person	$11,500
18 - 22 Jan 2027	Berlin, Germany	In person	$11,500
18 - 22 Jan 2027	Boston, USA	In person	$11,500
18 - 22 Jan 2027	Brussels, Belgium	In person	$11,500
18 - 22 Jan 2027	Budapest, Hungary	In person	$11,500
18 - 22 Jan 2027	Cairo, Egypt	In person	$11,500
18 - 22 Jan 2027	Cape Town, South Africa	In person	$11,500

Dates	Venue	Format	Fee
18 - 22 Jan 2027	Casablanca, Morocco	In person	$11,500
18 - 22 Jan 2027	Dammam, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Dhahran, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Doha, Qatar	In person	$11,500
18 - 22 Jan 2027	Dubai, United Arab Emirates	In person	$11,500
18 - 22 Jan 2027	Edinburgh, United Kingdom	In person	$11,500
18 - 22 Jan 2027	Edmonton, Canada	In person	$11,500
18 - 22 Jan 2027	Frankfurt, Germany	In person	$11,500
18 - 22 Jan 2027	Geneva, Switzerland	In person	$11,500
18 - 22 Jan 2027	Houston, USA	In person	$11,500
18 - 22 Jan 2027	Istanbul, Turkey	In person	$11,500
18 - 22 Jan 2027	Jakarta, Indonesia	In person	$11,500
18 - 22 Jan 2027	Jeddah, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Jubail, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Khamis Mushait, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Kigali, Rwanda	In person	$11,500
18 - 22 Jan 2027	Kuala Lumpur, Malaysia	In person	$11,500
18 - 22 Jan 2027	Lisbon, Portugal	In person	$11,500
18 - 22 Jan 2027	Liverpool, United Kingdom	In person	$11,500
18 - 22 Jan 2027	London, United Kingdom	In person	$11,500
18 - 22 Jan 2027	Los Angeles, USA	In person	$11,500
18 - 22 Jan 2027	Luanda, Angola	In person	$11,500
18 - 22 Jan 2027	Madrid, Spain	In person	$11,500
18 - 22 Jan 2027	Manama, Bahrain	In person	$11,500
18 - 22 Jan 2027	Marbella, Spain	In person	$11,500
18 - 22 Jan 2027	Marrakech, Morocco	In person	$11,500

Dates	Venue	Format	Fee
18 - 22 Jan 2027	Miami, USA	In person	$11,500
18 - 22 Jan 2027	Milan, Italy	In person	$11,500
18 - 22 Jan 2027	Munich, Germany	In person	$11,500
18 - 22 Jan 2027	Muscat, Oman	In person	$11,500
18 - 22 Jan 2027	Nairobi, Kenya	In person	$11,500
18 - 22 Jan 2027	New York, USA	In person	$11,500
18 - 22 Jan 2027	Nice, France	In person	$11,500
18 - 22 Jan 2027	Oslo, Norway	In person	$11,500
18 - 22 Jan 2027	Paris, France	In person	$11,500
18 - 22 Jan 2027	Port Louis, Mauritius	In person	$11,500
18 - 22 Jan 2027	Prague, Czech Republic	In person	$11,500
18 - 22 Jan 2027	Pretoria, South Africa	In person	$11,500
18 - 22 Jan 2027	Riyadh, Saudi Arabia	In person	$11,500
18 - 22 Jan 2027	Rome, Italy	In person	$11,500
18 - 22 Jan 2027	Sarajevo, Bosnia and Herzegovina	In person	$11,500
18 - 22 Jan 2027	Sharm El Sheikh, Egypt	In person	$11,500
18 - 22 Jan 2027	Singapore, Singapore	In person	$11,500
18 - 22 Jan 2027	Stockholm, Sweden	In person	$11,500
18 - 22 Jan 2027	Tokyo, Japan	In person	$11,500
18 - 22 Jan 2027	Toronto, Canada	In person	$11,500
18 - 22 Jan 2027	Tromso, Norway	In person	$11,500
18 - 22 Jan 2027	Vienna, Austria	In person	$11,500
18 - 22 Jan 2027	Zagreb, Croatia	In person	$11,500
18 - 22 Jan 2027	Zurich, Switzerland	In person	$11,500
18 - 22 Jan 2027	Online, Virtual	Online	$11,500

CERTIFICATE