Practical Seismic and Geophysics Exploration Training Course



07 - 11 Dec 2026

Cairo

3700 € (Per Person)

Ref: #OG6641_254829

Course Introduction / Overview:

The oil and gas industry, as well as a range of other fields, relies on understanding the subsurface. Applied geophysics uses physics principles and advanced technology to explore and map the Earth's interior. This training course is specifically designed for professionals to master the modern techniques of seismic and geophysics exploration, crucial for identifying, evaluating, and managing natural resources. Drawing on established academic work like z Yilmaz's book, "Seismic Data Analysis," this course provides a comprehensive framework for turning raw data into actionable insights. Participants will learn how to effectively use seismic reflection and refraction methods, as well as other geophysical techniques like gravity and magnetics, to locate hydrocarbon deposits, minerals, and groundwater resources. BIG BEN Training Center has developed this program to be highly practical, ensuring that participants can confidently interpret complex seismic data, analyze subsurface structures, and mitigate exploration risks. The course goes beyond theory, emphasizing hands-on application to ensure participants can meet the demands of a competitive industry. By integrating best practices and real-world case studies, this course prepares professionals to make informed decisions that drive successful exploration projects.

Target Audience / This training course is suitable for:

- Geoscientists and exploration geologists.
- Petroleum and reservoir engineers.
- Geophysical data interpreters and technicians.
- Geology and geophysics students.
- Professionals in mining and environmental sectors.
- Government agency personnel involved in natural resource management.

Target Sectors and Industries:

- Oil and gas.
- Mining and mineral exploration.
- Civil and geotechnical engineering.
- Environmental and groundwater management.
- Government agencies and equivalents.

Target Organizations Departments:

- Exploration and production departments.
- Subsurface and reservoir characterization teams.
- Geology and geophysics research units.
- Engineering and data analysis departments.
- Asset management and strategic planning.

Course Offerings:

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

- Understand the fundamental principles of applied geophysics and seismic exploration.
- Master the skills required for seismic data acquisition, processing, and interpretation.
- Analyze and interpret seismic reflection and refraction data to map subsurface geology.
- Utilize geophysical methods such as gravity and magnetics for resource exploration.
- Apply quantitative interpretation techniques to characterize reservoirs and fluid properties.
- Integrate well log data with seismic information to build accurate subsurface models.
- Assess geological risks and identify potential hydrocarbon traps.
- Perform seismic stratigraphy and structural interpretation.

Course Methodology:

This training course uses an immersive and interactive methodology to ensure a deep and practical understanding of the subject matter. The approach moves beyond traditional lectures, incorporating a blend of technical presentations, hands-on workshops, and collaborative problem-solving exercises. Participants will engage with real-world case studies, allowing them to apply seismic and geophysical concepts to complex scenarios they might encounter in their professional lives. We will use industry-standard software to process and interpret actual seismic datasets, reinforcing the theoretical knowledge gained in the sessions. Group discussions and peer feedback are encouraged to foster a collaborative learning environment. BIG BEN Training Center's trainers are experienced geophysicists who will provide personalized guidance and support throughout the course, ensuring that each participant can master the skills necessary for success. This blend of individual practice and team collaboration will ensure participants leave with the confidence to tackle real-world challenges in applied geophysics and seismic exploration.

Course Agenda (Course Units):

Unit One: Foundations of Applied Geophysics

- Basic principles of seismic wave propagation.
- Understanding seismic sources and receivers.
- Fundamentals of seismic reflection and refraction.
- Introduction to gravity and magnetic methods for exploration.
- The role of geophysics in the full exploration lifecycle.
- Overview of seismic data acquisition techniques.
- Introduction to geophysical software platforms.

Unit Two: Seismic Data Processing and Imaging

- Review of seismic data formats and quality control.
- Static corrections and noise attenuation.
- Velocity analysis and normal moveout (NMO) correction.
- Seismic stacking and migration principles.
- Advanced imaging techniques and their applications.
- Introduction to seismic inversion methods.
- Hands-on data processing and quality assurance.

Unit Three: Structural Seismic Interpretation

- Principles of structural mapping from seismic data.
- Interpreting faults, folds, and other tectonic structures.
- Using seismic attributes for structural analysis.
- Seismic ties to well data for calibration.
- Depth conversion techniques and best practices.
- Mapping geological horizons and unconformities.
- Case studies in structural interpretation.

Unit Four: Stratigraphic and Reservoir Seismic Interpretation

- Fundamentals of seismic stratigraphy and sequence analysis.
- Identifying depositional environments from seismic data.
- Quantitative seismic interpretation for reservoir characterization.
- Using AVO (Amplitude Versus Offset) and inversion techniques.
- Mapping reservoir properties like porosity and fluid content.
- Time-lapse (4D) is seismic for reservoir monitoring.
- Practical exercises in stratigraphic interpretation.

Unit Five: Integrated Subsurface Modeling and Risk Assessment

- Integrating seismic, well log, and geological data.
- Building a comprehensive 3D subsurface model.
- Using geophysical data to reduce exploration risk.
- Economic evaluation of exploration prospects.
- Emerging technologies and future trends in geophysics.
- Final project and presentation of a full exploration workflow.
- Final Q&A and course wrap-up.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can advancements in machine learning and big data analytics fundamentally transform the future of seismic interpretation and hydrocarbon exploration?

What unique qualities does this course offer compared to other courses?

This course stands out by bridging the gap between foundational geophysics theory and practical, real-world application. It avoids rigid, lecture-heavy formats and instead focuses on a hands-on approach where participants work directly with industry-standard software and authentic datasets. Unlike other programs that may provide only a theoretical overview, our curriculum is built around the entire exploration workflow, from data acquisition and processing to final interpretation and risk assessment. The content is constantly updated to reflect the latest industry trends and technological advancements. We do not just teach participants how to use tools, we teach them how to think like an exploration geophysicist, equipping them with the critical problem-solving skills needed to succeed in a dynamic field. This emphasis on practical knowledge, combined with expert guidance from professionals in the field, ensures that participants are not just learning concepts but mastering a valuable skillset.