COURSE OVERVIEW DE0952

Geosteering: Fundamentals, Planning and Implementation (E-Learning Module)

Course Title
Geosteering: Fundamentals, Planning and Implementation (E-Learning Module)

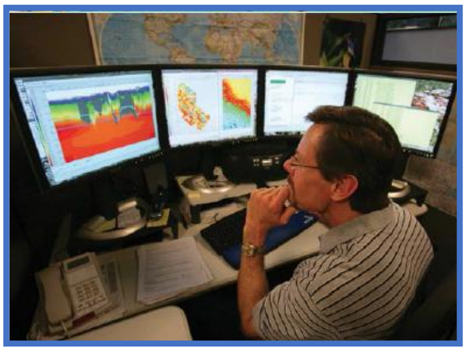
Course Reference
DE0952

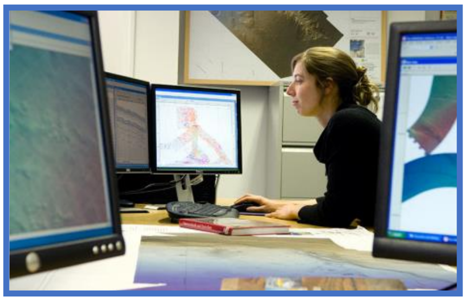
Course Format & Compatibility
SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration
30 online contact hours
(3.0 CEUs/30 PDHs)

3.0 CEUs (30 PDHs) AWARD

Course Description





This E-Learning course is designed to provide participants with a detailed and up-to-date overview of the fundamentals, planning and implementation of geosteering. It covers the strategy and methodology, horizontal and deviated well geosteering; the basic concepts, application, essential elements of reservoir geology and structural features; the steering systems, BHA steering tendencies and BHA orientation and tool face; the MWD directional surveys, survey calculation methods, survey spacing, static and instantaneous surveys; and the ellipsoid of uncertainty, collision avoidance, structural uncertainty, geological and drilling targets.

During this course, participants will learn the dog leg severity (DLS) limitations; building rate, BHA tool building capabilities, steering modes and steering ratios; the well trajectory planning, sidetracks and obstacles avoidance trajectories; the interpretation of image patterns and deep directional electromagnetic measurements; the proactive and reactive geosteering; the cross sections displays; the geosteering principles, bed dip, bed thickness and incident angle calculations; the well landing strategy and geosteering; and the drop rate, inclination changes and horizontal trajectory management.

Course Objectives

Upon the successful completion of this course, participants will be able to:-

- Apply and gain an in-depth knowledge on the fundamentals, planning and implementation of geosteering
- Explain strategy and methodology as well as identify horizontal and deviated well geosteering
- Discuss basic concepts, application, essential elements of reservoir geology and structural features
- Recognize steering systems, BHA steering tendencies and BHA orientation and tool face
- Employ MWD directional surveys, survey calculation methods, survey spacing, static and instantaneous surveys
- Discuss the ellipsoid of uncertainty, collision avoidance, structural uncertainty, geological and drilling targets
- Determine dog leg severity DLS limitations, Build rate, BHA tool building capabilities, Steering modes and steering ratios
- Plan well trajectory and identify sidetracks and obstacles avoidance trajectories
- Interpret Image patterns and review deep directional electromagnetic measurements (remote boundary detection)
- Differentiate proactive and reactive geosteering as well as describe cross sections displays (distortions and projections)
- Discuss geosteering principles, bed dip, bed thickness and incident angle calculations
- Apply well landing strategy and geosteering using true stratigraphic thickness
- recognize drop rate and inclination changes and perform horizontal trajectory management

Who Should Attend

This course provides an overview of all significant aspects and considerations of geosteering for reservoir engineers, drilling engineers, log analysts, geologists and other technical staff.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- USA International Association for Continuing Education and Training (IACET)

  Haward Technology is an Authorized Training Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 1-2013 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 1-2013 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Fee

As per proposal

Course Contents

- Integrated Geosteering Studies in Real Time -Mockup or Reality?
- Problems
- Strategy and methodology
- Examples
- Horizontal and Deviated Well Geosteering
- Basic concepts and application
- Essential elements of reservoir geology
- Structural features
- Steering systems
- BHA steering tendencies
- BHA orientation and tool face
- Real time data transfer
- MWD directional surveys
- Survey calculation methods
- Survey spacing
- Static and instantaneous surveys
- Surveying instruments
- The ellipsoid of uncertainty
- Collision avoidance
- Structural uncertainty
- Geological and drilling targets
- Dog leg severity DLS limitations
- Build rate
- BHA tool building capabilities
- Steering modes and steering ratios
- Well trajectory planning
- Sidetracks and obstacles avoidance trajectories
- Practical examples of geosteering limitations imposed by different trajectory type

- Azimuthal borehole images
- Image patterns and their interpretation
- Deep directional electromagnetic measurements (remote boundary detection)
- Proactive and reactive geosteering
- Cross sections displays (distortions and projections)
- Overview of available LWD technologies free of vendor bias
- Geosteering principles
- Bed dip, bed thickness and incident angle calculations
- True dip versus apparent dip measurements and usage
- Well landing strategy
- Geosteering using true stratigraphic thickness
- Drop rate and inclination changes
- Horizontal trajectory management
- Target change techniques
- Pushing The Limits of Geosteering & Wells Placement
- Case studies - Best Practices and Strategies for Well Placement and Geosteering
- Horizontal Well Placement Benefits of High Resolution Images in Real Time, Case Study from UAE
- Dive into the Channels. Mapping Channel Facies with Multilayer Bed Boundary Detection Technology
- Adapting to the UR Business Model, a fit-for-purpose Geosteering Solution
- Drilling Horizontal Wells with Pilot Hole Elimination in Challenging Geological Scenarios
- Role of wellplacement in Maximizing Production Performance in an Undeveloped Carbonate Reservoir A Case Study, Offshore Abu Dhabi
- 3D Surface Shape Conformance QC in Geological Model Building
- Reactive Geosteering for Real-Time Pro-Active Well-Placement decisions targeting multiple thin carbonate layers A Case History from an Undeveloped Reservoir, Offshore Abu Dhabi
- A Jurassic Target Below a Highly Depleted Chalk Field: how can we get there?
- Conscious drilling in carbonates. Well Placement with Multilayer Bed Boundary Detection Technology
- Staying Focused on the Goal to Improve Well Placement Effectiveness in Different Reservoir Scenarios
- Best Practices and Strategy based on Deep Directional Resistivity tools

- The Use of Ultra-Deep Resistivity Tools and its Impact on Cost Saving, Casing Design Optimization and Drilling Risks Reduction During Well Planning Phase
- Extra-Deep Azimuthal Resistivity in Deep Offshore Niger Delta
- The Greater Enfield Project: Planning for Success through Robust Well Placement and Geosteering Strategies
- Expanding the Envelope: Demonstrating a 200ft Depth of Detection for an Ultradeep Azimuthal Resistivity Tool
- Extra-Deep Measurements Aid the Navigation of a Horizontal Well Through a Multi-Channel Turbidite Sequence
- Integrated Reservoir Modeling with Deep Directional Resistivity Data and Its Application for Geosteering on Ivar Aasen
- Role of data integration for Intelligent Well Placement
- Distinguishing Shale from Water Utilizing Extra Deep Azimuthal Resistivity and Inversion Technology for the Grane Field
- Geosteering Driven by Geophysics - Reservoir Structure Prediction Ahead of Bit
- Integrating Multiple Datasets to Improve Reservoir Understanding across Halfdan NE, Danish North Sea
- Advanced Geophysics combined with Deep Directional Resistivity Complementing in-fill Well Placement and Successful Geosteering
- Data integration and multidisciplinary approach for well placement and field development: review of the Goliat field case history
- Breaking The Norms of Geosteering & Well Placement
- Uncertainties in wellbore surveying
- Utilising Geological Markers to Verify the Wellbore Vertical Geometrical Placement
- Wellbore Trajectory Uncertainty Management for Geosteering Optimization
- Quantification of Survey Deviation in Real-Time to Prevent Well Collision
- Vision for Well Placement and Geosteering –Where the Industry is Going?
- A Methodology for Effective Earth Model Management while Geosteering
- Towards a Fast Integral Equation Method for Inversion of Electromagnetic Data
- Are you Myopic, Naïve or Farsighted About your Geosteering Decisions?
- Local 3D Understanding Around Horizontal Wells Provided by Deep 2D Azimuthal Resistivity Inversions
- Look Ahead Opportunity in Geosteering Operations: real time seismic calibration using ultra-deep azimuthal resistivity
- Boundary Detection Ahead of the Bit – a sensitivity study of Extra Deep
- Resistivity Ahead of the Bit – from Vision to Reality

- Geo-steering within Ultra-thin Reservoirs in Block-5
- Rotary steerable directional tool precision in Unconventional Resources
- Integrated Geosteering Solution In High Uncertainty Faulted Reservoir-Oman
- Complex Deepwater Reservoir in the Niger Delta
- Ensemble-based Decision-support Workflow for Operational Geosteering
- Geo-Steering Horizontal Wells
- Outline
- Directional Drilling Service Company Display – Lacks Detail
- Spreadsheet-based tools are widely used by industry-largely a drafting tool
- WellSight Software
- Geo-steering Requirements
- THE PROCESS
- Geosteering…LWD signal mapping (or correlating)
- What's the stratigraphy?
- Technical Hole Deviation (THD)
- THD Components
- Vertical Technical Hole Deviation Log
- Fuzzy Logic
- Steering Guidance
- Case Studies
- Before geo-steering software, we were all clueless
- "Post mortem"
- Technical geo-steering corroborates wellsite geologist calls
- Value Creation with Multi-Criteria Decision Making in Geosteering Operations
- Multiple Objectives in Geosteering Case Histories
- Objectives of Geosteering Operations
- Current Practice Used in Making Multi-Criteria Geosteering Decisions
- Multi-Criteria Decision Making Method
- Decision Analytics for Multi-Criteria Geosteering Decision
- Case Study—Impact of Different Decision Criteria on Final Well Trajectories
- Problem Statement
- What is geosteering for?
- Well placement scheme

- Geosteering work phases
- Phase 1 well planning
- Phase 2 landing the borehole 2 to target reservoir
- Phase 3 geosteering the well in the reservoir
- Phase 4 work analysis and optimization
- Well geosteering example planning
- Drilling within Target Reservoir
- Evaluating optimal well placement in horizontal drilling using geosteering: A case study of Agbada Field, Niger Delta
- Statement of problem
- Methods of study
- Results and discussion
- Geosteering evaluation
- Lateral D7.0 build and land
- Model input data